

# Sonic Homework Acoustic Foam Kit Installation Guide



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# Introduction

Thanks for your purchase from Sonic Homework! We're glad you chose us, and we want you to get the most bang for your buck. This guide is meant to point you in the right direction when installing your acoustic foam, but of course it is no substitute for an in-depth analysis of your acoustic situation. We touch on some of the more common techniques and situations, but all applications are unique, so we recommend doing some research as well.

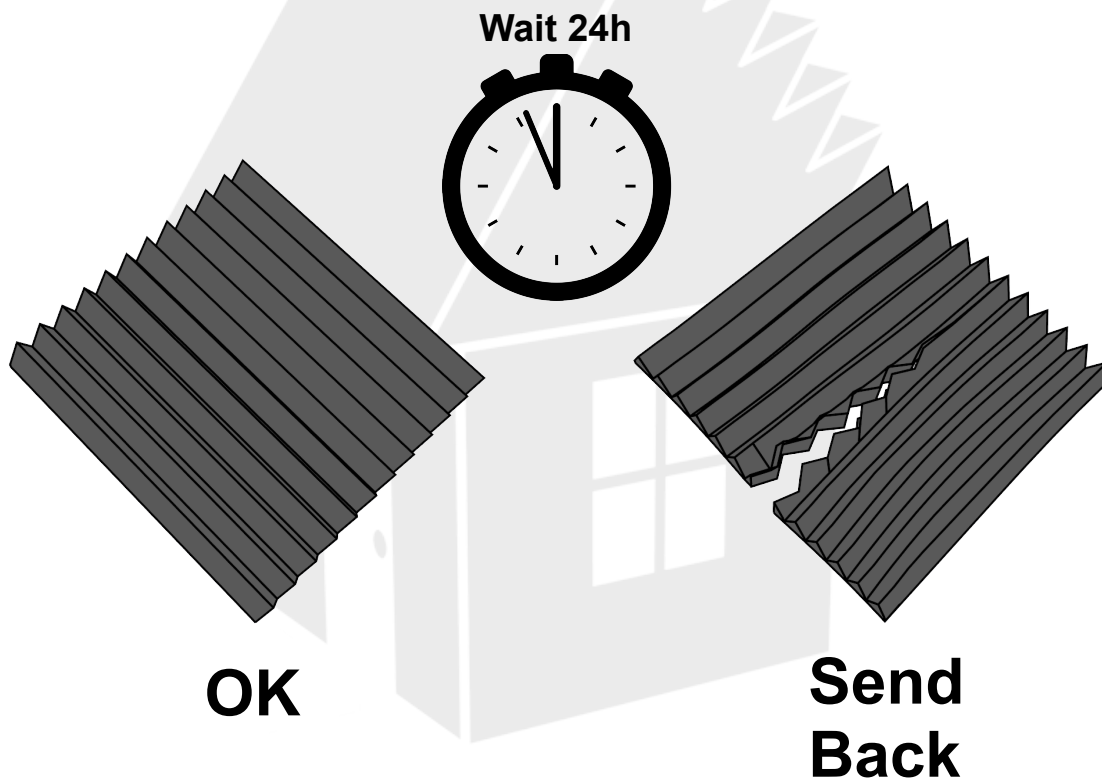
Acoustic foam also has many purposes beyond treating acoustics in an average-sized room. However, these applications are beyond the scope of this guide – for example, building microphone baffles, industrial applications, or treating performance spaces.

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# 1. Get your materials together


First things first. Unpack the acoustic foam. Double-check that everything is correct and in good condition before getting started. We can't accept returns that have already been glued, taped or cut! Let the foam expand for up to 24 hours at room temperature.




After 24 hours, if the foam doesn't look like it has expanded fully, or is misshapen/defective in some way, please let us know immediately. Very rarely, foam can be damaged during storage or shipping and lose its shape. If you think this is the case, we will be glad to set things right.

When the foam is expanded and you're ready to hang it up, make sure you have the following:

- Acoustic foam
- 4 double-sided adhesive tabs per foam panel,
- *(8 per corner bass trap, or T-pins)*
- Measuring tape (recommended)
- Level (recommended)
- Pencil (recommended)
- Scotch, masking, or other less-sticky tape (optional)
- Sharp, long scissors (optional)

 **NOTE:** The adhesives bundled with Sonic Homework acoustic foam kits are meant for light-duty applications like home studios, recording spaces, and so forth. If you are using our kits for industrial or heavy-duty applications, the adhesives may not perform properly. For these applications, aftermarket heavy-duty adhesives are recommended.

 **NOTE:** The adhesives in our kits are semi-permanent and tend to damage painted surfaces if/when removed. There are some ways to mitigate this (see tip on page 4), but you should assume they are going to screw up your paint. Sonic Homework is not going to cover your security deposit, so take care!

 *Remember that each 24" x 24" panel is 4 square feet – sometimes one can forget this and under-count the square footage by half. 2 panels = 8 square feet, 4 panels = 16 sqft, and so on...*

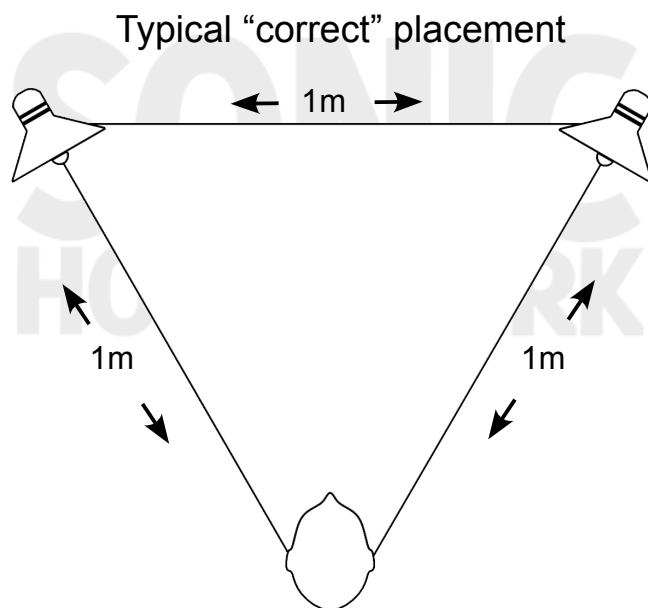
Once you have all your stuff together, make sure you have a few hours free, and get to work.

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## 2. Speaker Placement

Proper placement of speakers, instruments, or microphones within a room is as crucial to good acoustics as acoustic treatment. Before hanging your foam, make sure your gear is placed as optimally as possible. When it comes to loudspeakers, this is pretty straightforward. With performance, practice, or recording spaces, the listener or mic and sound sources can (and should) move arbitrarily depending on the situation, so this section will focus on listening-focused environments.

The standard recommendation is to form an equilateral triangle with the listener's ears and the tweeters of the loudspeakers. So, if possible, set your speakers the same distance from each other as they are from your listening position (i.e. where you sit while listening, mixing, etc). Position them so that the tweeter is aiming directly at your ears, both in terms of angle and height. For near-field monitors, the suggested length of one side of this triangle is typically 1 meter (about 39 3/8"). This is a good starting point for most listening situations, but check your speaker manufacturer's recommendations for more specific advice. Speakers are sometimes designed with slightly different angles and/or distances in mind.



If you are like most people, you don't have unlimited options in speaker placement. Usually there are things in the way (TV, computer, furniture, doorways, beds, etc) that prevent truly optimal placement. With that in mind:

-Keep speakers away from walls

-Don't situate the listening position near a wall

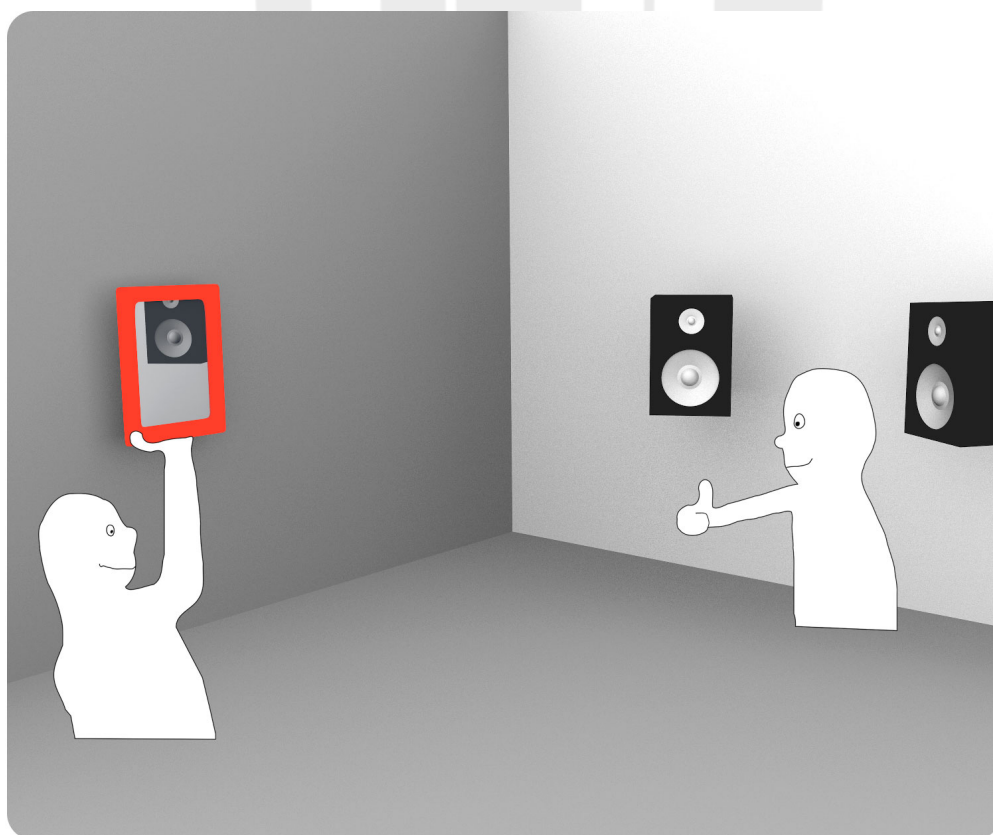
-Avoid pointing the speakers at hard, smooth surfaces, especially windows or other glass. For example, a glass-topped desk between you and your speakers will cause the sound to bounce up from your desk at your ears, causing unwanted distortion of the frequency response. Avoid such situations when possible!



### 3. Determine placement for foam

As a rule of thumb, the most important place to add acoustic foam is at the so-called primary reflection points. This placement reduces 'early reflections' coming from the wall, which are particularly harmful to imaging and clarity of sound. Primary reflection points are the spots on walls, floors, and ceilings from which sound will bounce directly into your ears.

Get an assistant to hold a mirror at eye level, against the wall, while you sit in the listening position. Have them move the mirror along the wall until you see a reflection of a speaker. Mark that spot with tape or a pencil. There should be two spots on each wall where you can see a reflection of the speaker (one for the left speaker, one for the right). So, in many cases, you will have 6 spots to start – two each on the left, right, and back walls. You will want to put at least one 24" x 24" panel at each spot, right around ear level.



Depending on the space, it might also be necessary to do the same thing on the ceiling, especially if the ceiling is flat and solid. Use a mirror attached to a broomstick (or some such contrivance) and have your assistant move the mirror along an imaginary line on the ceiling connecting your speaker to your listening position, and mark the spots where each speaker is visible.

Beyond first-reflection points, study the room and look for potential trouble areas. Are there large expanses of bare wall? Are you getting flutter echo from one part of the room in particular? Clap your hands and listen for a 'buzzing' or metallic echo while walking around the room. Does one frequency in particular show a large boost or cut? Use a test tone generator to find out. You might be able to find good spots for treatment by comparing the wavelength of that frequency, multiples of that wavelength, and the dimensions of your room.

Once you've determined where to put all of your acoustic foam, it's time to get your hands dirty! Well, not literally, we hope.

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## 4. Hanging Foam

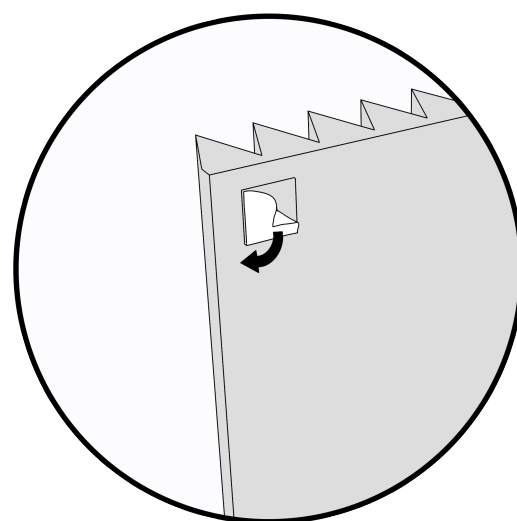
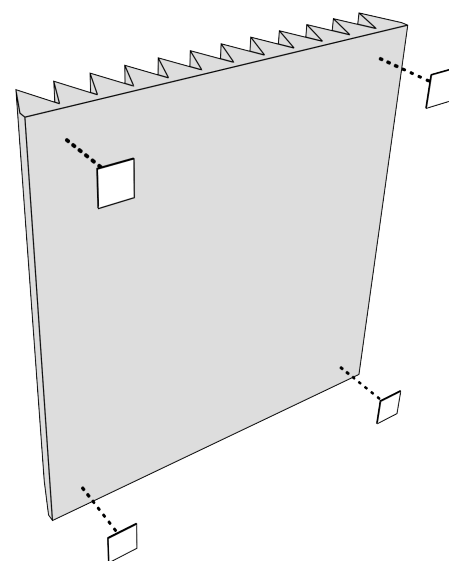
Hanging the foam is pretty straightforward once locations are determined, but attention to detail can improve the result. First, it's a good idea to mark the wall for the exact locations of the foam once the areas for treatment have been determined. Use the measuring tape, level and pencil, making sure that your panels will be evenly spaced and straight. "Measure twice, cut once" as they say.

These instructions assume you're using the default double-sided adhesive tape to hang your foam. If you're using T-pins, attaching the panels should be self-explanatory.

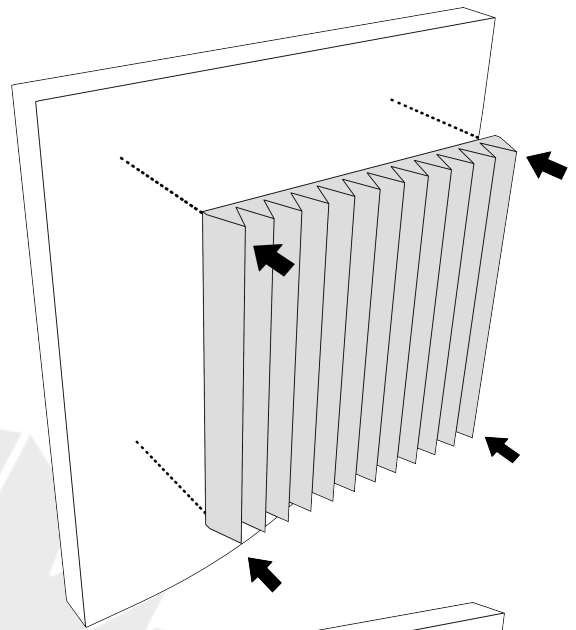
To attach a panel to the wall using double-sided adhesive:

1. Working one at a time, peel the backing from one the adhesive tabs, and stick them to the corners of the acoustic foam panel. Press the tabs as hard as you can. Let the glue set for at least 15-20 minutes before moving to the next step.

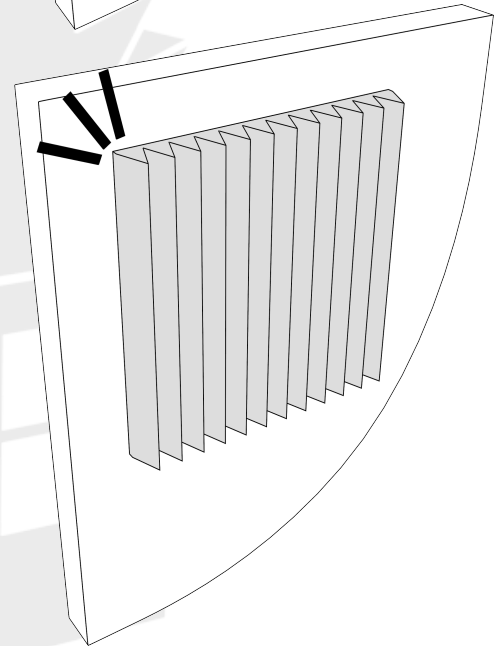
2. Carefully peel the backing from the tabs already attached to the foam panel. Be careful not to accidentally peel the tab off of the panel.





3. CAREFULLY line up the panel with the desired location on the wall or ceiling. It may be easiest to hold the panel by the top two corners and use the top edge to orient the panel. Stick the panel to the wall or ceiling, pushing VERY FIRMLY on each corner to attach the tab to the mounting surface.



4. Avoid putting any lateral force on the panel once it is attached. The adhesive gradually creates a firmer bond over time, but is most vulnerable to failure (un-sticking) within the first 24 hours or so. If your adhesives fail and you run out of tabs, get in touch with Sonic Homework and we can send some extras.



 TIP: The adhesive used has great potential to screw up painted surfaces. It's quite difficult to remove once it has set. If you would like to avoid this, there is a way to mitigate damage from adhesives, but please keep in mind that it's far from perfect. First, find and mark the exact locations where you would like to place your acoustic panels. Then, place a patch of paint-safe adhesive tape corresponding to each corner of the acoustic panel that will go there. (Pick a tape that you think might be wall-friendly). The patch needs to be bigger than the adhesive tab – try 2" by 2" or larger. The idea is to place a layer between the adhesive tab and the wall, making it easier to remove in the future. However, if you've ever hung posters with tape and tried to remove it years later, you know that tape can wreck paint as well. Proceed with caution.

 TIP: If you have pencil marks left over on your wall, we have found that melamine foam scrubber pads are a great way to remove them. These are sold as Mr. Clean Magic Eraser, but there are cheaper, equally good generics out there.

## 5. Check the results!

Now that the room is treated, you may be thrilled with how it sounds, you may notice that the difference is smaller than you'd hoped, or you may notice more specific issues that were masked by bigger acoustic problems before. If the room is not perfect, don't give up! There are steps to take that don't necessarily involve buying more foam from Sonic Homework, although we certainly encourage that if you feel it's necessary.

### *Is the bass out of control?*

It's hard to treat deep bass (lower than about 120 hz) with acoustic foam. Steps to consider. Add or move furniture in the room to block/absorb bass. If you have a subwoofer, move it around the room to find a spot where it sounds more even. Add bookcases to diffuse sound waves in the back of the room. If anything is close to a wall (speakers, listening position, subwoofer), move it as far from the wall as you can. If you feel particularly handy, you can construct resonant bass traps from plywood in an attempt to control the very lowest frequencies.

### *Is there still a lot of echo?*

If more than 75% of the wall in your listening space is still bare, you might need more acoustic treatment. Beyond foam, draperies are also an option. If you have a hard floor that is mostly bare, this could also be reflecting a lot of unwanted sound. Obviously acoustic foam is not an option here, but use the mirror method to find reflection points on the floor, and try to get a rug or other floor covering in there. If it suits your taste, cork tiles are considered a good floor covering with favorable acoustic properties.

*Does the room sound 'dead' or 'woofy' now?*

You may have gone too far with absorptive treatments. It's possible to over-treat a room and tip the balance to low frequencies, while losing some subjective sense of spaciousness. Remove some treatment from the wall and check again. More than 50-75% coverage is potentially too much. If you haven't cut or taped your foam panels, you can return them, if it turns out that you bought too many. Yes, that is okay!



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## 6. Further Reading

If you want to get more in-depth, which we definitely recommend, take a look at these articles:

### [Acoustic Treatment and Design for Recording Studios and Listening Rooms](#)

Ethan Winer's treatment of acoustics is fairly authoritative and instructive. He favors fiberglass as an acoustic absorber, and focuses on heavy DIY, but gives thorough coverage to many topics in practical acoustics.

### [Acoustic Fundamentals And The Nature Of Sound](#)

Pro Sound Web has a quick introduction to some of the vocabulary you will encounter when reading about acoustics. It's not terribly comprehensive, but they have also covered a wide variety of acoustics-related topics [here](#).

### [Studio SOS: Building a DIY Vocal Booth](#)

Sound on Sound, true to form, clearly and thoroughly describes step-by-step the building of a high-quality vocal booth at home. Although such projects are beyond the scope of this guide, reading it should give you some insight into how acoustic treatment is supposed to work. Although they use Auralex in this story, we can forgive them, since Sonic Homework didn't exist at the it was written.

### [Overdub: A Guide to Studio Monitors](#)

M-Audio provides an extremely graphic guide to studio monitors, including a section on room acoustics. And by extremely graphic, we mean it's in comic book form. Worth reading for the illustrations alone – a picture is worth 1000 words, and there are some good ones here.

### [Wikipedia: Acoustics](#)

It hardly needs to be said, but Wikipedia is a treasure trove of information on acoustics and sound in general. The treatment is over-broad relative to the scope of this guide, but if you want to become a real expert, might as well start here.