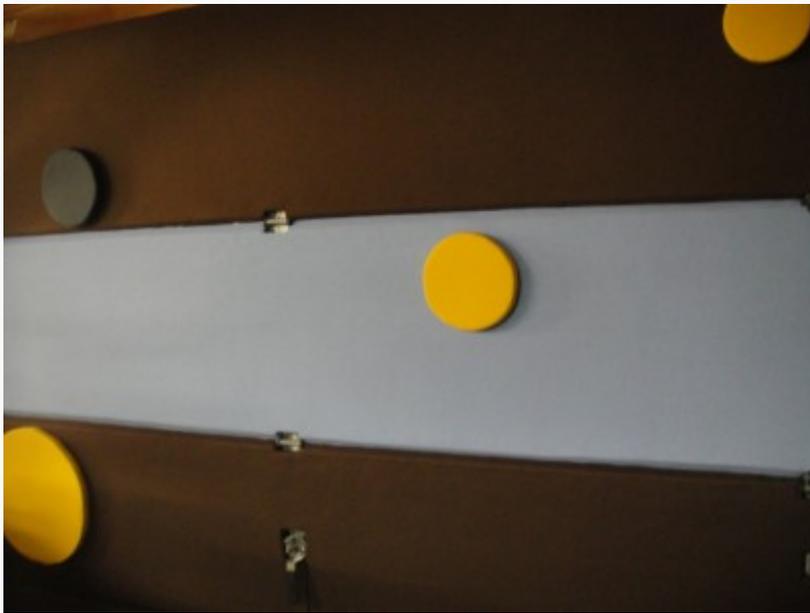


How to Make Your Own Workshop Garage Door Insulation

Bobby



Closing a major gap in your shop's envelope, while making it look cool at the same time.

“But my garage door is already insulated! It came that way!” Well, not like this! My workshop garage door came pre-insulated with some fiberboard with a plastic coating behind the metal panels, like only $\frac{3}{4}$ ". But, during the summer, the heat comes right through in the afternoon since it's facing west. The fiberboard is just not enough to stop the heat from the metal panels. It does help slightly with noise.

In previous articles about your garage shop's comfort, I emphasized the use of [radiant barriers](#) to keep your shop cool. You see, when your walls, roof, and doors heat up during the day, they give that heat back to you in the form of radiation. Not nuclear exactly, but heat. If you go into your attic, and put your hand near the roof sheathing during the summer, you'll feel the radiant heat without even touching it. This radiation heats up all the objects around it, and thus your whole woodshop. That's why you start sweating when you step into your hot garage in the summer. It's not so much the hot air around you, it's the radiant heat from the roof.

A [radiant barrier](#) prevents this radiant heat from making it into your shop. The silver-colored foil not only reflects it, but its surface won't emit it either. Silver objects are poor emitters of radiant heat. Black color surfaces are the best absorbers but also the best emitters. This is why the radiant barrier can face either direction, but must have an airspace adjacent to it. You want a low emissivity surface somewhere adjacent to an airspace either on or in your garage doors to keep things cool.



Integrating a radiant barrier into the panels is what motivated me to add them to begin with; the west-facing garage doors get super hot in the afternoon, making it very un motivating to be there.

Temperature isn't the only thing you should consider. Sound is a big deal if your garage is also your woodshop. Design your entire shop envelope to both absorb sound and block sound. You can read more about this in [How I'm Soundproofing My Shop Part I](#) and [How I'm Soundproofing My Shop Part II](#).

Most garage doors are a large percentage of your wall area. Such square footage will make a big difference to you if it's poorly designed or well designed. It's often the biggest source of air leakage too. Below I'll walk you through how I insulated my garage door and kept some bugs out too!



After applying the spray adhesive, I put the fleece on and cut it to size.



This is pretty much what I used for the project as far as tools/ supplies.

Goals to use for Your Design

This whole time since I bought my house I've had foil-faced foam panels just leaning against the garage door to provide some protection from radiant heat. I bought those foam panels to insulate my walls and they were just being stored.

But as I used those up during my wall insulation project, I was losing the effect of blocking the radiant heat and could really feel that during the summer months. Now, before the heat gets too bad, I'm going to close this gap in my shop envelope.

I decided I want my garage door to do certain things, like:

- Keep out Summer heat

- Keep in Winter heat and contain heated shop air
- Contain my loud shop noise (from disturbing neighbors)
- Absorb sound so I don't get to re-listen to the noise upon echo
- Keep out bugs
- Be secure (lockable)
- Look awesome

I've already got both garage doors physically locked, and I've turned off the garage door openers. This keeps it more secure since I don't keep the car in my garage.

But heat gain and sound attenuation are still problems. There are some gaps in the perimeter [weather seals](#) that allow bugs to get in too. I may add some additional [seals](#).



The windows add to the heat in the shop; before I made the panels I had a section of radiant barrier taped over the windows with gaffer's tape.

Basic Design of the Insulation Layers

To achieve the goals above, I decided I want to have a radiant barrier. But with that, you need a minimum of a $\frac{3}{4}$ " airspace between the source of radiant heat and the foil. That could be either within the garage door panel itself, or toward your shop's space. While a radiant barrier works just as well facing the shop's inside (remember the foil won't emit the radiant heat absorbed by your door), I didn't want that as my décor.

So then I knew I needed an internal $\frac{3}{4}$ " airspace. Looking at each panel in the door, I notice that it has a sheet metal outer skin, a plastic-laminated fiber-board sheet glued to that, and then a deep channel-frame around the panel. This frame is thicker than the sheet metal and foam layers, so you could slip a rectangular foam sheet in this channel and call it done, but I realized it could serve as my air space if I put the new foam panels on the outside of the channel frame.

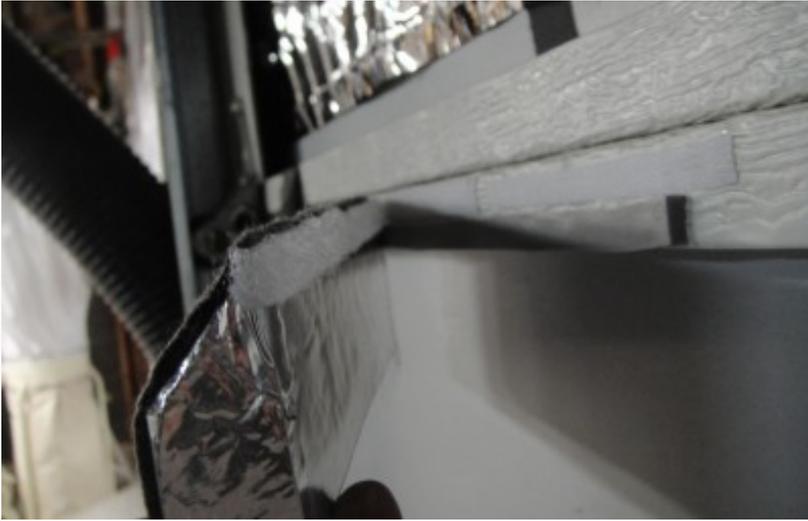
So, from the outside layer inward, I have the existing sheet metal skin, an existing fiberboard panel layer, and an airspace. Next I need a radiant barrier layer. I could just put a foil sheet or some bubble-type foil, but I think by adding a foil-faced sheet of polyisocyanurate foam will give me additional R-value. This helps keep heat inside my

shop from leaving during the winter, and will also delay any heat that does make it through the metal channel frame (which doesn't benefit from the radiant barrier).

Now sound is the next thing I want to tackle. Theatres often use sound absorbent sheet materials covered with cloth to keep echoes under control. For our purposes, some fluffy felt-like material like [fleece](#) will suffice. I originally wanted to use soundboard panels as another layer but they're way too heavy for a garage door. Since the gray felt-like blanket is kind of ugly and would collect duct in the fibers too easily, I'll cover that with better looking cloth. That'll give me an opportunity to select a cloth color and pattern that will make my environment more aesthetically inspiring.



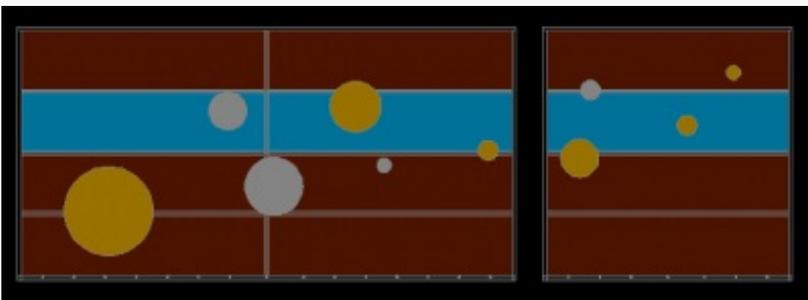
This is a mock-up I did for the panel construction. It's basically a 1" polyisocyanurate foil-faced foam sheet, with foil tape over the edges, with fleece (or felt) secured with spray adhesive, and the decorative fabric overlaid on top of it all.



Here you can see the attachment scheme; Velcro. I found that applying the Velcro to the door first with both pieces stuck together, with the sticky adhesive exposed, then press the foam panel to it. To remove, I just separate the two Velcro pieces.



What took some time is custom-cutting around the hinges. Kind of a trial and error thing, like sneaking up on miter cuts.



My design drawn in cad. I experimented with many different color schemes, mostly contrasting colors.

Materials Needed

The trickiest part of this was figuring out how much cloth I needed, since it's sold by the yard. Other than that, I just bought what I thought I needed and if I ran out of something, like foil tape, I just picked up some more.

- Polyisocyanurate foil-faced foam sheets
- Spray Adhesive (I used [3M Super 77](#))
- [Foil Tape](#)
- Felt or [Fleece](#) Blanket Material
- Cloth, several colors (pick good color combos, such as gray-orange, bright green-brown, etc.)
- [Weatherstrip foam tape](#)
- [Velcro \(adhesive-backed\)](#)
- [Fabric Scissors](#) (these are much sharper than most scissors and don't bind up the cloth, VERY important)
- Razor knife
- [Cheese knife \(Santoku Knife\)](#)
- Drywall square/ long straightedge
- [Small bar clamps](#) or C-clamps to hold the straightedge in place while cutting the foam sheets

WoodChip Tip: *I have a 3-car garage door, each "car" door is about 8 ft., so I have 24 linear ft. worth of door, and they're about 8 ft. high. With that much area, I bought about 5 cans of spray adhesive. I did a coat of adhesive to secure the felt layer, but only sprayed around the panel perimeter to adhere the decorative cloth and wrapped it around the edges. I taped the back perimeter with foil tape.*



I use a cheese knife to cut these because it has small divets in the side of the blade that prevent it from sticking to the cheese (and in this case foam); works great and I do run it through a knife sharpener every so often.



I applied spray adhesive on the perimeter primarily; this makes it easier to stretch it for a clean fit.



Nothing like a hot iron to coax cloth into behaving. I tried to convince myself that this is indeed a power tool. It does have a cord...

Installing the Insulation Panels

The panels alone won't help me with air infiltration. If you just stick them on there without sealing them to the door then air can flow freely around the foam. If you can seal off that airspace, you'll get some thermal and acoustical

benefit from that.

What I came up with is a system that allows me to remove the panels if I want but will also keep them pretty well-sealed to the door. Due to the hinges and other door hardware, it won't be perfect, but it can be close.

I put [weather seal tape](#) all around each panel, but left room around the perimeter for some Velcro tape. Make sure that when you attach the panel to the garage door frame the weather seal tape is being compressed a little bit to keep a good seal, and that it's continuous around the perimeter of the panel.



Here's where I did a mock-up to see if each panel fit; each one is custom cut because I found variations in the dimensions. Note the chamfer between panels to allow the door panels to pivot when it opens along the track.

Now, *between* the metal panels of your door you could have air leakage. You can check what your existing gap is, and find foam weather seal tape of the right thickness to put between and still allow the door to close completely. Make sure it doesn't cause stress on the existing panels by having too much material in there.

Each cloth-covered foam "panel" will run the full width of my door, but only be as high as the distance between the panel hinges as the door opens and folds on the curved track. If needed, you can use [construction adhesive](#) or something compatible with foam to join two foam panels together before covering them with cloth (to make one piece). Make sure that you chamfer the edges of your panel enough to allow for the movement of the door panel segment hinges. I found that the panels need to fit close together with no gap so the garage door frame doesn't show through or it looks ugly; cut straight and measure/ fit carefully.

WoodChip Tip: Another option if you don't want to see the horizontal lines between the panels is to cover the whole thing with one piece of fabric and spray adhesive. This will allow for the curvature of the door as it opens but will cover everything up nicely. Personally, I like the horizontal lines. I've always liked fences with horizontal slats.



I used weather seal tape to add a cushion to the panels, and to help keep the sunlight from leaking through. While you may not get a complete air seal from the panels, you can get pretty close.



The top panel is what blocks the sunlight; so I wanted to make sure it was nicely sealed to prevent light leaks. I can remove it if I want the natural light, but I think I'll put in a dual or triple-pane window on the north side with closable shutters.

Caution: Watch Out For These Things

Even though these panels are light weight, make sure the sandwich of layers you choose for your garage door can handle it. The manufacturer might be able to tell you the maximum weight the motor can safely handle.

Think about cleanability too. If the cloth color is too dark, it'll absorb light and make your shop's ambient light too low. Darker colors also show dust accumulation more readily. "Fuzzy" cloth will trap dust as well and be hard to clean, that's why I chose a tightly woven material. Even though the mocha brown color seems dark, my plan is to provide some accent lighting directed toward the panels.

This is an opportunity to make this your "accent wall" that contrasts with the other walls in your shop. Don't be afraid to have a bold pattern; I'm leaning toward a modern design. Colors on the opposite side of the color wheel will be the most contrast and will be more visually exciting. If you want calm, choose colors adjacent to each other on the color wheel relative to your other walls. You can always re-cover the panels, so don't fear getting tired of it. You can also add decorative shapes over the panels using [Velcro](#) tape; I'm doing various diameter cloth-covered foam circles to look like bubbles.



I added a strip of foam adhesive tape to the seams between the door panels to keep the door sealed when closed. The rubber seal around the door edges is kept tight by adjusting the track closer to the door frame but still allowing it to slide.



I took the time to seal any exterior gaps as well. This way, I'm taking care of all the garage door issues at once.

WoodChip Tip: *While you're at it, check the bottom seal of your door. If it's not even, or parts of it aren't being compressed to the floor and there's a gap, replace it with one that can handle the gaps and bumps when the door is closed. Also check the side seals; there are pretty good options out there that might give you a better seal. The corners of the door are usually a culprit for openings that bugs use as a highway inside. Use caulk or other creative weather seal joinery to seal these gaps shut. Where I have concrete seams below the bottom-seal, I filled it with caulk below the bottom seal so it's the same level as the floor.*

Most people don't bother with their garage door because it looks like a pain in the #\$\$@ to deal with. But, after a thorough cleaning, and adding cloth-covered insulation, it will give you the ability to get creative, solves several problems at once, and is a one-time project. Good investment for your woodshop.

Related Articles:

[How I'm Soundproofing My Shop Part I](#)

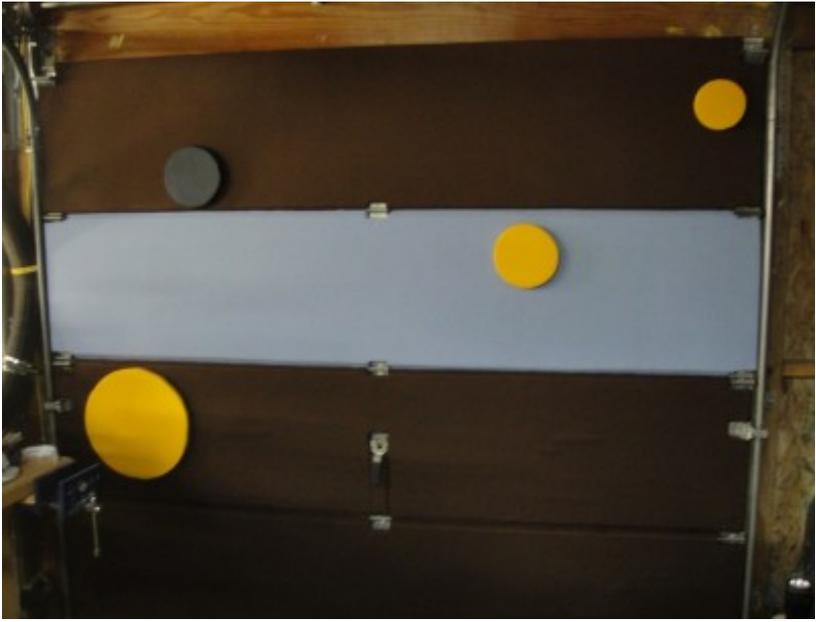
[How I'm Soundproofing My Shop Part II](#)

[Secrets to Easy Roof Improvements with Ludicrous Benefits to You](#)

[What to Do with Those Bare Walls](#)

[Wrap Your Shop for a Lifetime of Comfortable Woodworking](#)

The Finished Panels



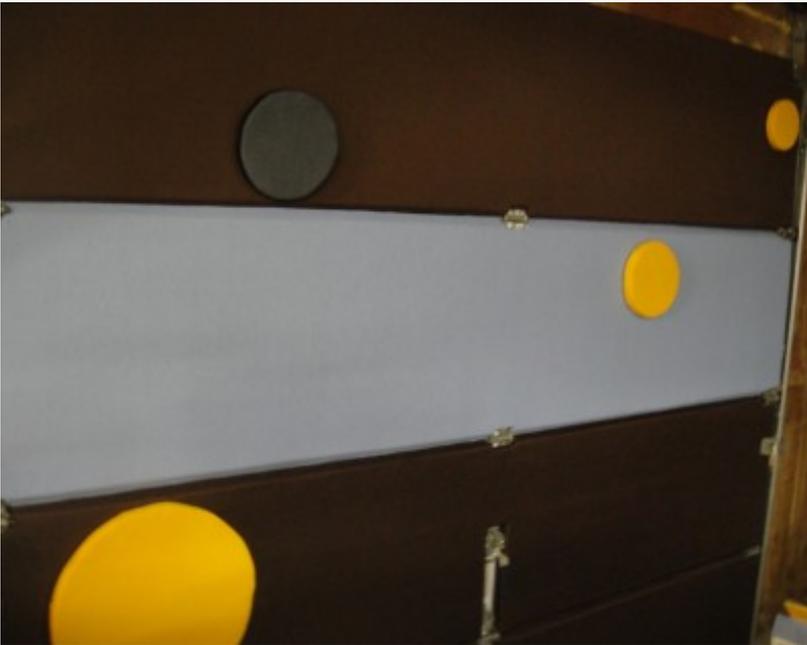


I spent quite a bit of time to get these to look decent; fitting cloth to circular objects isn't easy.





I found that to cover up inevitable wrinkles that wouldn't iron out, I put a spray-adhesive applied cloth band around the sides.



Pretty much done. I still have some work to do around the door with adding drywall and some insulation for a more finished look.

For more guidance in assembling your Workshop Design, click on the [Starting? Go Here!](#) category and read those first.

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