

DIY – Great Working Backdraft Damper for Solar Hot Air Collectors

After constructing and installing some solar hot air collectors in my house I was having a hard time stopping cold air drafts from entering on days of no sun.

I tried using store bought metal spring loaded dampers but was not satisfied with their performance, so decided to build my own.



How does it work?

- This backdraft damper is inserted into your existing hot air collector RETURN air pipe. I installed mine right inside the house. I removed the wall register grille, slid it into the pipe and put the register grille back on. Done.
- Once it's in place with fan OFF, the cloth section of the damper is naturally collapsed which seals off the tube internally which eliminates/blocks cold air backdrafts from entering your home at night or anytime your collector fan off.
- When the fan turns ON the collapsed cloth OPENS WIDE EFFORTLESSLY, allowing UN-RESTRICTED AIR FLO back out to your collector.
- Benefits? – Increased air flow – 90% of cold air backdrafts eliminated.
- To STOP heated air from ESCAPING house just INSTALL one of these in your HEAT SUPPLY DUCT tube inside the house behind the wall register. At night or anytime the fan is off, heat can no longer escape back out the pipe into your collector.

Materials Needed

- **Fabric** I used a type of cloth normally used as a LINING material for Men's/Women's Suit Coats. It is virtually air tight, very light weight and flexible fabric purchased at a nearby Fabric store. We purchased a 3 ft x 57 inch piece of cloth to use for multiple damper construction.
- **Tape** = Gorilla or Duct Tape works but Gorilla tape says it's weather proof so we went with Gorilla brand.
- **Large Plastic Flexible "For Sale" sign or plastic sheet material** – is used to create the custom sized tube in the pictures below.
- **Weather Stripping** – Used to seal damper into ductwork tubing.

FYI

High quality material doesn't always work.

- I first tried using a high quality nylon type material normally used to make 'flags' but no good.
- Very durable, water proof too, but as you can see in the picture below it would not collapse with fan OFF, so we had to trash the yellow material.



Construction Time = 10 minutes

- I cut the plastic sign in half LONG WAYS then wrapped it around into a circle just small enough to fit inside a 6 inch metal ductwork then taped it up to keep it from un-rolling.
- I then wrapped the cloth around the edge of the plastic tube and taped it in place all the way around the edge. **UPDATE!** - **2 layers of material** wrapped around the plastic tube is even better. Tested it with 2 layers and it worked perfectly. Opened totally and collapsed fully.



Final Construction

- Once you have the cloth taped to the plastic tube just **push the cloth back thru the tube** so it sticks out the other side approx 12 inches.
- I attached/wrapped ¼ inch wide weather stripping around the outside edges of the tube (on each end of the tube) to make a nice snug, air tight fit after sliding it into the metal ductwork tube. If you size the plastic tube for a tight fit into the metal return pipe.. Weather stripping is not necessary.
- Picture on left shows how well the cloth seals off the inner part of the tube.
- Picture on right shows how the material collapses flat when no air is flowing thru the tube.



Inserting Damper into Collector Return Tube

- Just slide the cloth and damper into your return tube.
- Below shows the damper inserted almost all the way into the metal 6 inch diameter return tube and another shot of it all the way in, flush with the sheetrock wall.
- That white edging you see is the ¼ inch wide weather stripping. Once the damper is slid in, it's air tight all the way around the edge of the tube.
- After it's inserted I reached in the hole and taped the bottom of the cloth to the metal duct tube so it's impossible for the cloth to blow back in the wrong direction. Just install your grille and you are good to go.



ADVANTAGES

- Very inexpensive to build.
- Can be built in approx 10 minutes.
- It's totally customizable to any style/size or configuration return pipe or register....round or square.
- The theory of material flopping over an opening to seal drafts keeps it simple.