



GREEN ECONOMIES YOUTH FELLOWS PRESENTS

# HOW-TO GUIDES

SEALANT TAPE - DUCT SEALING



**DUCT JOINTS**



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HOMIE ENERGY RETROFIT

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# IMPORTANCE OF DUCT SEALING



Having properly sealed ducts can balance the air temperature in your home because air will be able to reach each room, thus creating a more comfortable living space.

Properly sealing your ductwork can also reduce your utility and energy costs because the HVAC system will not have to work so hard.

When your ductwork is sealed as it should be, it will be unable to leak conditioned air out into unoccupied spaces like your attic or crawlspace.

As a result, you'll save energy and extend the life of both your cooling and heating systems.





## TOOLS

- Ladder
- Paintbrush
- Putty Knife (optional)
- Light
- Zip Ties (to be used on flexible ductwork)
- Cable tie gun (for flexible ductwork zip ties)
- Utility Knife
- Cleaning Cloth

## MATERIALS

- (2) Duct sealant tape (referred to as Mastic Tape or Foil Tape, for thermal leaks greater than  $\frac{1}{4}$ " )
  - (1) *Aluminum tape (to be used on metal ductwork)*
  - (1) *Fiberglass tape (to be used on metal ductwork)*
- Liquid Mastic (for thermal leaks under  $\frac{1}{4}$ " )

## PPE

- Gloves
- Mask
- Knee Pads



# PRECAUTIONS

- The tape that you will use is a duct sealant tape that is referred to as mastic tape or foil tape. Do not get duct sealant tape confused with regular duct tape. Although with similar names and similar appearances, the two serve different purposes. Over time, the conventional tape will dry, crack and eventually give way to costly air leaks. Also, make sure that the connections at vents and registers are well-sealed where they meet the floors, walls, and ceiling. These are common locations to find leaks and disconnected ductwork.
- Sealant mastic is only designed for thermal leaks under 1/4". If the hole or gap is larger than 1/4", you must first apply a web-type drywall tape such as fiberglass tape to create a bridge, and then you can apply the mastic sealant. The tape serves as a base for applying the mastic sealant.
- Wear proper shoes on the ladder if accessing overhead attic space.
- Before applying aluminum foil tape, you need to ensure that your ductwork is clean and free of dust or grime.
- When applying foil tape, it's important to make sure the tape adheres to the ductwork. Press down on both sides of the tape to make it stick. You want to create a good seal without any air bubbles in the foil tape.



## HOW-TO STEPS

1. Access the attic and/or crawlspace.
2. Locate the source of the thermal leaks by inspecting the ductwork while the air conditioner is running. Thermal leaks are areas within a structure where there is energy leakage in the form of heat or cold energy. In this case, you will need to inspect the duct connections to locate any air leakages. You may keep the air conditioning running while inspecting for leakages but make sure to turn it off as you apply the sealing techniques.

## PREP WORK

Now that we have all our tools and materials, we can now get started on sealing the ductwork.

Prep your ductwork with the following steps:

First, let's access the attic and/or crawlspace and identify any areas of thermal leaks which are areas within a structure where there are energy leakages in the form of heat or cold energy.

Look out for those connections where there are visible air gaps and areas where the original tape or mastic seems to not be adhering properly to the ductwork. You may keep the air conditioning running while inspecting for leakages but make sure to turn it off as you apply the sealing techniques.

## 03A

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Start by disconnecting the ducts where they come together.

## 04A

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You will want to seal the duct joints as that is where air will escape. Take a damp cloth and wipe away dust from the duct joints. A clean and dry surface works best.

## 05A

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For flexible ductwork, apply a nickel-thick layer of mastic on the lip of the ductwork that will go on the inside.

## 06A

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Take the flexible ductwork that will go over the previous piece and pull back the outside liner and insulation to get to the inner liner. Pull the inner liner over the inside piece making sure to form a complete seal with the mastic.

## 07A

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Wrap a zip tie around the ductwork joint and tighten it with a cable tie gun to reinforce the seal.

## 08A

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Work the insulation layer forward, into place and then do the same with the outside liner. Finally, seal the ductwork joint with one more zip tie.

## 09A

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Inspect to verify that leaks are sealed. Allow mastic to dry and cure for 48 to 72 hours before turning the air back on.



## 03B

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Pull the foil insulation back to reveal the galvanized ductwork.

## 04B

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You will want to seal the duct joints as that is where air will escape. Take a damp cloth and wipe away dust from the duct joints. A clean and dry surface works best.

## 05B

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Use a brush or putty knife to apply a small layer of mastic to the duct joints. Take a length of fiberglass tape and wrap it around the duct joints, this will give the mastic additional strength.

## 06B

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Apply a second nickel-thick layer of mastic to the duct joints. Finally apply mastic to any remaining holes, cracks, or overlaps and allow the mastic to dry.

## 07B

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Once dry, put the foil insulation back around the ductwork. Wipe down the surface of the insulation where it comes together. Apply aluminum tape across the insulation in one foot increments

## 08B

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Now apply a piece of aluminum tape down the length of the insulation. Finally apply two more pieces of aluminum tape on either side of the previous piece to keep it secure.

## 09B

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Tape over any remaining holes in the insulation with at least 2-3 layers

## 10B

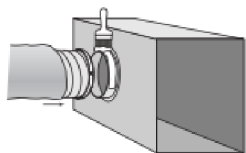
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Inspect to verify that leaks are sealed. Allow mastic to dry and cure for 48 to 72 hours before turning the air back on.

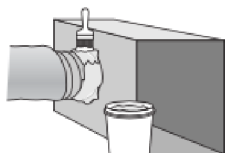
# FREE KITS

Get an energy savings kit free of charge from SWEET Alabama and lower your monthly bills.

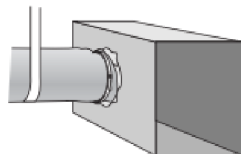
## How to seal flex-duct joints



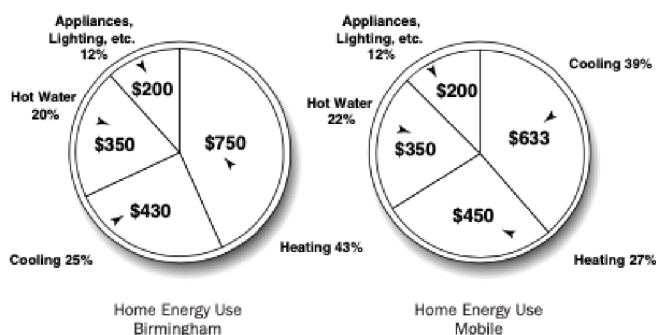
Roll back outer cover and insulation on flex duct and spread mastic on connector and plenum



Slide inner liner over connector, install compression strap, apply mastic over liner and strap



Secure outer cover with compression strap, provide support strap within one foot of connection



## Energy Literacy: Understanding Units That Measure Energy

**Watt (W)** - A watt is the basic unit of power used to measure electricity capacity and is equivalent to one joule per second. The higher the watt rating (e.g., 40, 60, 100W), the brighter the light. LED bulbs use far less watts to produce the same amount of light.

**Kilowatt (kW)** - A kilowatt is 1,000 watts.

**Kilowatt hour (kWh)** - A kilowatt hour is 1,000 watts used for one hour (power x time). It is the unit of energy most commonly used on household electricity meters.

**Therm** - A therm is the energy equivalent of burning 100 cubic feet of natural gas.

# TERMINOLOGY TOOLBOX

## **Caulk**

/kôk/: a waterproof filler and sealant, used in building work and repairs.

## **Crawlspace**

/ˈkrôl ˌspās/: an area of limited height under a floor or roof, giving access to wiring and plumbing.

## **Energy Burden**

/ˈenərjē ˈbærd(ə)n/: percentage of household income that goes toward energy costs (electricity, home heating, etc.)

## **Faceplate**

/ˈfās.plāt/: the covering of the front of an electrical device, outlet or light switch.

## **Galvanized Ductwork**

/ˈgalvəˌnīzd ˈdæktwərk/: coated steel with a thin zinc layer used most often for building ducts. This material's zinc coating helps prevent corrosion and rust buildup.

## **Insulation**

/ˌɪnsəˈlāSH(ə)n/: material used that reduces heat loss or heat gain by providing a barrier between the inside of your home and the significantly different temperature outside.

## **Jamb**

/jam/: a side post or surface of a doorway, window, or fireplace.

## **Mastic**

/ˈmastik/: high-grade construction adhesive commonly used to bond ceiling, wall, floor, etc.

## **Outlet Gasket**

/ˈoutˌlet ˈgaskət/: foam material used to seal off the wall cavity behind outlets & switch areas from the living space.

## **Vent**

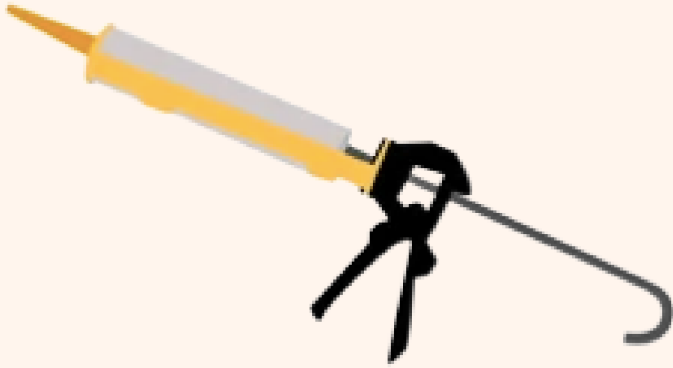
/vent/: an opening that allows air, gas, or liquid to pass out of or into a confined space.

## **Weather Strip**

/ˈweɪˌHərˌstri:p/: a strip of material to cover the joint of a door or window and the sill, casing, or threshold so as to exclude rain, snow, and cold air.



# TERMINOLOGY TOOLBOX



**Caulk/Caulking Gun**



**Crawlspace**



**Galvanized Ductwork**



**Insulation (Foam)**

# TERMINOLOGY TOOLBOX



**Jamb**



**Mastic Sealant**



**Outlet Gaskets**



**Weather Strip**