

# THE SKINNY

## Duct Sealing



A typical duct system can lose about 20% of conditioned air through leaks, holes, and poorly connected ducts. Properly sealed ducts reduce energy loss and utility bills, and can improve your home's comfort, indoor air quality, safety, and humidity balance.

Ducts distribute conditioned air throughout your house. Ductwork that is well sealed and insulated can help maintain a more even distribution of heated and cooled air in the home and improve indoor air quality by reducing the intake of pollutants such as dirt, dust, and mold into the duct system. Properly sealed ducts help prevent backdrafting of carbon monoxide from gas furnaces and water heaters into living spaces. Additionally, duct sealing helps air conditioning systems work more efficiently by avoiding the intake of hot, humid air from leaky return ducts.

Here are some tips on what to look for and how you can deal with air leaks in your duct system.

### IS YOUR DUCT SYSTEM WORKING PROPERLY?

Check your duct system if:

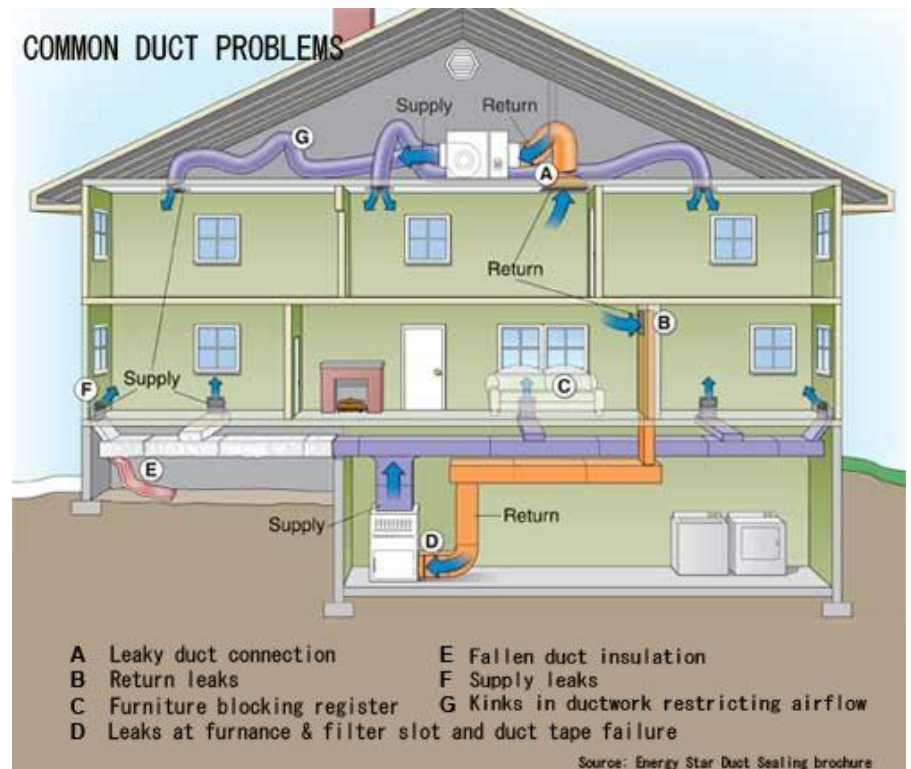
- You have high energy bills
- Your furnace or air conditioner runs for long periods of time
- Some rooms are stuffy or feel noticeably hotter or cooler than others
- You have exposed ducts in an attic, basement, crawlspace, or garage
- You have indoor air quality problems and/or excessive dust issues
- You are aware of tangled or kinked flexible ducts in your system

### FIND LEAKS IN YOUR DUCT SYSTEM

Most air leaks occur at duct joints and connections, including at the initial connection to the furnace or air conditioner, at branches in the duct system, and at the vents where a duct meets the floor, wall, or ceiling. Little or no air leaks through the plastic or metal walls of ducts.

Because many ducts are hidden in walls and floors, you may need a professional contractor to perform whole-house repairs of duct system leaks. However, exposed ductwork can be easily sealed by a handy homeowner.

Look for streaks of dirt around registers or duct connections and holes and duct joints that are connected mechanically and not sealed, paying special attention to joints near the furnace and air conditioner unit and duct penetrations in walls and floors. Next, check the connections at vents and registers to make sure ducts are well-sealed where they meet the floors, walls, and ceiling. These are common areas for leaks and disconnected ductwork.



## SEAL LEAKS WITH MASTIC & TAPE OR AEROSOL SEALANTS

Since most ducts are hidden under floors and in walls, a professional contractor can help make sure the duct system is sealed tightly. However a handy homeowner can make a dent in home energy bills and comfort by sealing leaks and cracks in exposed ductwork.

### *Tapes and Mastic*

You can seal ducts with metal-backed (foil) tape or duct mastic. Don't use duct tape—it does not seal joints well and has a very short life expectancy. Duct sealant or mastic can be applied easily with a paintbrush and is available at most home improvement stores. You can also use a special butyl or foil tape—this is soft malleable aluminum foil coated with a high temperature adhesive—to seal small holes and duct joints. If applied correctly, foil tape is more effective than mastic, but it must be purchased at specialty heating supply stores and takes much longer to install. Tape should be UL 181 approved and must be applied to a clean surface with a plastic squeegee or putty knife to ensure a proper seal. Large holes are generally patched with sheet metal then sealed with mastic. Seal gaps around ducts with spray foam caulk where they penetrate the floor or ceiling.

### *Aerosol Sealants*

If your energy audit finds significant duct leaks hidden inside your walls, ceilings or floors, then you should consider hiring a technician to repair these. A professional can repair hidden leaks without major renovation using an aerosol sealant, which seals air leaks from the inside of ducts in inaccessible areas. The sealant is blown into the ducts where it remains suspended until it finds a leak. The particles attach to the edges of leaks and build up until it is sealed. While this requires a trained technician to properly apply, aerosol sealants typically come with a minimum ten-year warranty and excellent results.

## CONSIDER DUCT INSULATION

Ducts in unconditioned spaces, such as the basement, crawlspace, attic or garage are a major source of conduction heat loss and should be properly insulated. Be certain to seal all holes and connections first—if you use mastic, allow it to dry for 24 hours before adding insulation. You can buy insulating wrap at most home improvement stores—be sure to get insulation material rated at least R-6. Either purchase insulation with a self adhesive surface or use zip ties to secure the insulation tightly around ductwork. Cut the insulation to fit and seal seams with foil tape or staples. If the duct is used for cooling, buy insulation with a vapor barrier layer or apply a vapor barrier to the outside to prevent condensation when warm moist air hits the cold surface.

## LEARN MORE

Energy Star: [http://www.energystar.gov/index.cfm?c=home\\_sealing.hm\\_improvement\\_sealing](http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_sealing)

U.S. Department of Energy: <http://www1.eere.energy.gov/consumer/tips/ducts.html>

The CRC's contractor referral network: [http://www.conservationcenter.org/e\\_contractors.htm](http://www.conservationcenter.org/e_contractors.htm)

[www.conservationcenter.org](http://www.conservationcenter.org) ☼ 1702 Walnut Street, Boulder, CO 80302 ☼ 303.441.3278

### Duct Sealing for do-it-yourselfers

It is not difficult to seal and insulate exposed ducts yourself, but if your energy audit indicates major problems, you should contact a professional. To seal and insulate ductwork yourself, here are some materials to consider. Most of these materials can be found at home improvement stores, HVAC supply companies and on-line.

**UL listed foil tape:** make sure it's U.L. 181 approved. Apply to a clean surface with a plastic squeegee.  
*Cost:* about \$16 for a 60 yard roll.

**Duct Mastic:** available in a 1 or 2 gallon pail (apply with a paintbrush), or 10 oz tube (apply like caulk and seal with a gloved finger).  
*Cost:* about \$16 to \$25 for a 1 gallon pail, or \$3 to \$5 for an 11 oz. tube.

**Foam caulk:** use to fill cracks and gaps around wall or floor penetrations.  
*Cost:* \$2 to \$5 for a 10 oz tube

**Duct insulation:** comes in a self adhesive roll or can be attached with large zip ties. Cut an exact fit and staple or tape seams with foil tape.  
*Cost:* about \$16 for a 1 X15 roll.

### Professional Duct Sealing

A professional contractor can evaluate and repair the whole duct system and check the supply and return air balance and system safety.

The cost of professional duct sealing varies depending on the size and complexity of the system and needed repairs. Always get bids from more than one contractor and ask about their cost structure, installation methods, service and warranty policies.

The CRC provides a listing of local contractors through its contractor referral network:

[www.conservationcenter.org](http://www.conservationcenter.org)