

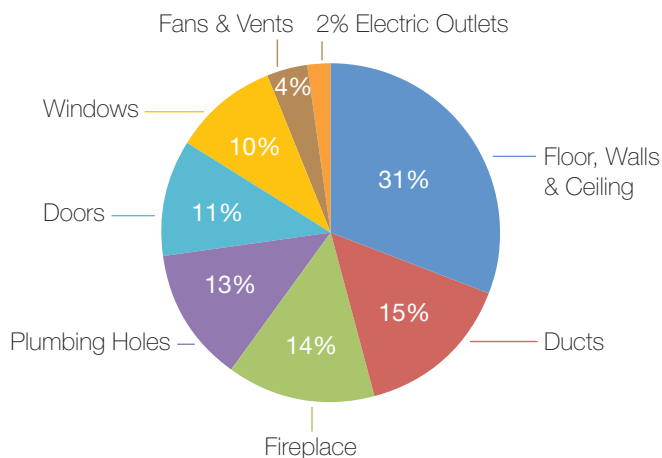
LOCATING & SEALING AIR LEAKS

According to the Environmental Protection Agency, 25 to 40 percent of the energy used for heating and cooling a typical home is due to air leakage. Warm air leaking into your home during the summer and out of your home during the winter can waste a lot of energy dollars. That's why tightening up your home is the first step you should take in cutting your energy costs. A modest investment in time and effort can pay real dividends when it comes to reducing energy costs. Experts say a \$25 investment in caulking and weatherstripping could result in hundreds of dollars of energy savings every year.

How does air escape? Air leaks in and out of your home through every hole, nook and cranny. Common leakage sites include: plumbing holes through walls, floors and ceilings; around chimneys; fireplace dampers; attic access hatches; recessed lights and fans; wiring holes; missing plaster; electrical outlets and switches; moldings around windows, doors and baseboards; and dropped ceilings above bathtubs and kitchen cabinets (see figure 1).

figure 1

Typical Air Leakage Locations



Source: U.S. Department of Energy, *ENERGY SAVERS, Tips on saving Energy & Money at Home*

Getting started

Repair all obvious sources of air leakage first, such as broken windows and holes where air can enter through the ceiling, walls

or floor. Check anywhere building materials join and look for daylight that is visible through the cracks. After these have been properly sealed, you will be ready to tighten up other less obvious air leakage areas.

Caulking vs. Weatherstripping

Caulking is used between non-moving parts where the gap is less than ½-inch wide (e.g. between window frame and wall). Apply caulk on a clean dry surface after removing any old caulk and paint — the best time to caulk is during dry weather when the temperature is above 45 °F. Weatherstripping comes in cleverly

Myths and Facts

Myth: A house can be too air-tight.

Fact: It's almost impossible to make a home too tight, especially an older home. If your home feels stuffy or there is condensation forming on your windows, it is probably the result of inadequate ventilation—make sure that kitchen and bathrooms have good exhaust ventilation (recommended to the outside and not into an attic or crawlspace).

Note: If you are heating with an unvented gas or kerosene heater, it is necessary to crack open a nearby window to allow moisture and exhaust gases to escape and fresh air to enter.

Myth: Windows are the largest source of air leakage in the home.

Fact: Only about 10 percent of a home's air leakage is through windows (see figure 1). The majority of air leakage in older homes is through the floor and ceiling and these areas are the first priority. However, if your windows are beyond repair or are beginning to rot, consider replacing them with newer, more efficient ones. If your windows are still in good working order, then storm windows are a more cost-effective option.

designed strips of felt, rubber, metal or plastic that fills the spaces around doors, windows and attic hatches — it compresses and seals when they are shut. There are a variety of weatherstripping materials available from your local hardware store.

No Cost

- **Identify and prioritize** where leakage might be taking place — air leakage locations are not always obvious and easy to find (see figure 1). Prioritize your air sealing strategy by identifying the biggest leaks first. On a windy day, locate leaks by running your hands near those leakage sites mentioned in figure 1.
- **Lock your windows to make sure they are shut.** Locking a window helps create an air-tight seal.
- **Keep the fireplace damper closed when the fireplace is not in use.** Even when the damper is closed it is still leaking air and taking your money up the chimney. In a well insulated home, an open damper can raise heating and cooling energy consumption by 30 percent. An inadequately sealed fireplace is one of the worst sources of air leakage in the home. According to the Department of Energy, sealing and weatherstripping the fireplace in a typical home can reduce air leakage by 14 percent or more. If you're not using your fireplace, seal it up.

Low Cost

- **Window putty** (glazing compound) is used to seal a loose windowpane.
- **Select the best product to do the job.** Ask your local hardware store attendant for the best sealing product for your project. Discuss the location, surface type, size of leak, etc.
- **Seal the leaks.** The best and most effective place to seal a home is on the inside. This not only prevents air movement, it also prevents moisture from accumulating in the wall and ceiling cavities.
- **Caulk the leaks in your ceiling.** Typical insulation does not stop air leakage. When you're up in the attic, look for dirty spots in the insulation. This often indicates a hole where air leaks into and out of your house. Caulk areas where air might escape from such places as ceiling light fixtures, wiring and plumbing holes in the kitchen and bath, electrical junction boxes and recessed light fixtures.

- **A foam backer rod** is used to fill large or deep cracks; then this is covered and sealed with caulk.
- **Rope caulk** can be used to air seal many leaky areas around the home — especially windows. This inexpensive material is very easy to apply and later, if you want to open the window, it's easy to remove. Note: always designate one window in each room as the fire escape and make sure that it is operable.
- **An attic hatch or pull-down stairway** in the heated and cooled part of your home needs to be weatherstripped and insulated.
- **Electrical outlet cover gaskets** reduce air leakage through electrical outlets. Although the savings is small (about two percent of heating and cooling costs) the cost is also low and it is an easy do-it-yourself project.
- **Window pulley seals are inexpensive and easy to install.** Many older double-hung windows have a rope and weight system to make it easier to raise and lower the window. The peel-and-stick pulley seal stops air leakage at this location while allowing the window to continue to function.

Investment

- **The duct system** in a typical home loses about 20 percent of the air that moves through it due to leaks and poorly sealed connections. This results in higher utility bills and an uncomfortable home. Observe the condition of your ducts; particularly how they are sealed; if uninsulated, check for gaps or air escaping at the joints. If the ducts are insulated, make sure the insulation is vapor sealed and securely taped. Consult a duct-sealing contractor and make sure that mastic or UL-approved duct sealing tape is being used (common "duct tape" does not hold up on ducts and should not be used). Also ensure that the ducts are insulated with R-5 duct insulation (Arkansas Energy Code) and carefully vapor sealed.

This Fact Sheet was developed for Energy Efficiency Arkansas (EEA), a partnership between the Arkansas Energy Office and Arkansas's investor-owned electric and gas utilities and electric cooperatives, to provide Arkansans with unbiased information about cost effective energy efficient practices, improvements and technologies. For further information go to www.EnergyEfficiencyArkansas.org.

