

Air Sealing and Mechanical Ventilation: A Quick Guide for Homeowners

A **home performance upgrade** makes your home more comfortable while helping reduce your energy bills. An upgrade prevents air and energy leaks and ensures that heating and cooling equipment is efficient, that ducts are free of leaks, and that your water heater and other home appliances are working efficiently. **Air sealing** and **mechanical ventilation** are two key components in achieving energy savings and ensuring that the air in your home is fresh and clean.

This quick guide explains the basics of air sealing and mechanical ventilation and why they are important. Much of the information in this guide is adapted from *Retrofit Techniques & Technologies: Air Sealing*, published by the U.S. Department of Energy.

AIR SEALING

What is air sealing?

Home performance contractors use air sealing to reduce leakiness in the home. Small air leaks throughout the home add up to the equivalent of leaving a window open all day, all year long. These leaks allow cold air to escape (and hot air to enter) during the summer and hot air to escape (and cold air to enter) during the winter.

Up to 30% of the energy—and money—spent heating and cooling air can be lost through these leaks.

Contractors use caulking, expanding foam, tapes, and other materials to reduce leaks and tighten the home.

Key spots for air sealing include the attic floor and kneewalls, recessed lighting fixtures, windows and doors, and any other place air has a chance to exit or enter the home.

What are the benefits of air sealing?

The main benefits of air sealing include:

- improved home comfort and air quality due to reduced air drafts, allergens, and pollutants
- lower utility bills due to reduced demand on heating and cooling equipment
- lower carbon footprint

How does my contractor know how leaky my house is?

Home performance contractors use a special fan called a **blower door** to measure **infiltration**, or how leaky your home is. Your contractor will complete the following steps during the blower door test:

- Close all exterior windows and doors (except the door in which the blower tool will be mounted)
- Open interior doors
- Close all fireplace dampers or wood stove air intakes

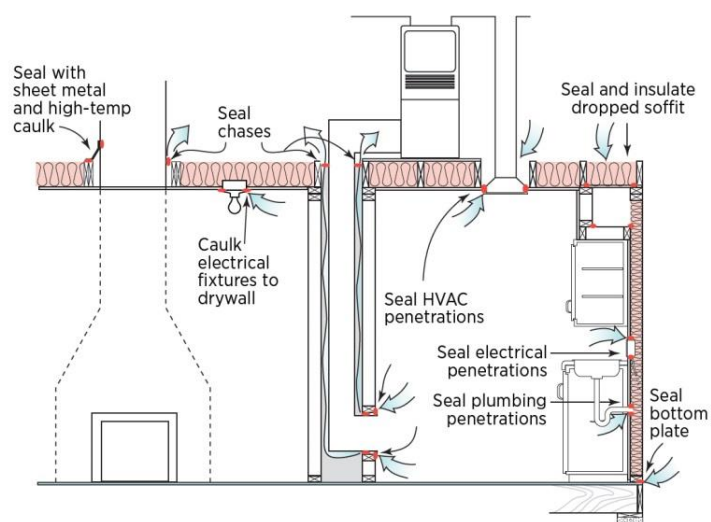
- Mount the blower door tool to an exterior door
- Turn on the blower door fan
- Record the blower door test results

How much air sealing should be performed?

Even brand new homes with extensive air sealing still leak a little bit. There's no such thing as a house with no leaks. But how leaky is too leaky?

To maximize your home's energy performance, your contractor should perform as much air sealing as possible, and use mechanical ventilation to ensure good healthy indoor quality.

In the SMUD Home Performance Program, a home must be below a certain leakage level in order to receive a rebate. This level is unique to your home based on your home's living space area, ceiling height, number of bedrooms, number of stories, and local climate. The bigger your home, the greater the allowable infiltration.



Key locations for performing air sealing (source: U.S. Department of Energy, 2010)



Blower door diagnostic tool mounted to exterior door

The formula used to determine this maximum allowable leakage is calculated automatically in the **Job Reporting Template** that your contractor uses to report information about your home to SMUD for quality assurance and rebate processing.

MECHANICAL VENTILATION

What is mechanical ventilation?

Mechanical ventilation systems are electric-powered fans that supply fresh air from the outside into the home. Spot ventilation, using exhaust fans in the kitchen and bathroom, removes water vapor and pollutants from the home, and is an important part of a home ventilation strategy. However, spot ventilation does not distribute fresh air throughout the home. Balanced ventilation systems, like air-to-air exchangers or energy recovery ventilators, both supply and exhaust air.

What are the benefits of mechanical ventilation?

The main benefits of mechanical ventilation include:

- improved indoor air quality due to reduced allergen, pollution, and moisture presence
- improved comfort due to proper flow of air into the home

How does my contractor know how much mechanical ventilation to install?

Adequate mechanical ventilation is calculated in the Job Reporting Template based on your home's square footage and number of bedrooms. The bigger your home, the more mechanical ventilation is needed to ensure good air quality.

Will mechanical ventilation undo the benefits of air sealing?

No. Properly installed and sealed mechanical ventilation will not undermine the energy and comfort benefits of air sealing. Air sealing and mechanical ventilation work together to save energy and money, improve comfort, and improve indoor air quality.

THE SMUD HOME PERFORMANCE PROGRAM

How do I choose a qualified contractor?

SMUD provides a list of Home Performance Program contractors at hpp.smud.org. All contractors on this list are qualified to earn energy upgrade rebates for your home.

What rebates available for air sealing and mechanical ventilation?

Air sealing and air quality rebate. \$350-\$600, based on the area of the home. This rebate is available for any home that does not already have proper mechanical ventilation installed. The contractor must reduce the home's infiltration by *at least* 20%, and must properly install adequate mechanical ventilation, as determined by ASHRAE standards.

Air sealing rebate. \$150-\$400, based on the area of the home. The contractor must seal the home to below the maximum allowable infiltration for your home. A home must be *leakier* than this standard during the test-in in order to qualify for this rebate. Most homes start off tighter than this standard, and thus are not eligible for the smaller rebate.

FOR MORE INFORMATION

For more information about energy efficiency incentives available through SMUD, visit:

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For more information about air sealing and mechanical ventilation:

<http://www.eere.energy.gov/>
<http://www.energystar.gov/>

Contractors:
Staple your business card here