



Can a Home Be Too Tight?

Yes. We are about to explain that it's important to seal up your house as well as you can, and then mechanically move unwanted air out... It makes sense. Honest. Read on.

Sometime during your crusade to seal those energy robbing cracks and holes in your home (probably when you are on your hands and knees reaching into a crawl space), you're bound to start asking yourself, "Isn't air flow important for a healthy home? Can I take this whole thing to the extreme?" The answer is yes and probably not.

Proper air flow in your home prevents pollutants, such as dust and mold (often a byproduct of an improperly ventilated home) from reaching unhealthy levels. In addition, for safety reasons, you need to make sure that all combustion equipment (range hood, boiler, water heater, clothes dryer, space heater, fireplace or wood stove) is properly vented. That's because if these appliances don't get enough air, they are prone to back-drafting—a situation that causes pollutants and, potentially, carbon monoxide to build up in your home. Another side effect of improperly vented appliances is that they can introduce substantial amounts of moisture into your home.

Here's the good news. If you live in an older home, chances are that your zeal for caulking, filling, insulating and foaming will abate long before you manage to seal your home to unhealthy levels. There are simply too many sources of infiltration, some of which are nearly impossible to reach in an existing home.

If you live in an older home, you probably don't need to be worried about hermetically sealing your home into an unhealthy state. However, if you have lingering concerns or if there are signs of airflow problems (such as moisture build-up or stale air), it's a good idea to have an energy audit performed on your home. Ask the auditor to point out potential trouble spots, so you can make a list of actionable items for you or a contractor to address.

Are there cases where a home may be deemed to be too tight? The answer is, maybe. People often attribute indoor pollution (e.g., dust mites, tobacco smoke, pollution caused by combustion heating) and moisture problems (rotting wood within walls, condensation on windows and doors) to the home being over insulated and over-sealed. But this isn't always a safe assumption. These problems could well exist in a home with moderate air leakage. In fact, sealing air leaks in this situation could actually make the problems worse. The first goal should be to reduce the indoor pollution by installing a whole-house ventilation system capable of providing healthy indoor air. If your home has indoor pollution problems, we recommend having a professional assessment as your next step toward healthy living.

Mechanical Ventilation Systems Belong in Every Home

Whatever the status of air leakage in your home; mechanical ventilation systems can play a significant role in promoting air flow and reducing odor and moisture in your home. Simply stated, every home should have both kitchen and bathroom fans to effectively dispatch moisture and odors. The American Society of Heating, Refrigeration and Air-Conditioning Engineering (ASHRAE) does recommend that kitchens have an intermittent exhaust capacity of 100 cfm, and bathrooms 50 cfm.

While kitchen and bathroom fans are effective at keeping pollutants at bay where they work, they do hardly anything in to bring fresh air into your home (something they weren't designed to do). That's why for home-wide comfort and energy efficiency, you can't do better than installing a Heat Recovery Ventilator (HRV) or Energy Recovery Ventilator (ERV). In simple terms, an HRV has two separate channels, whereas an ERV (designed for moist climates or those with cold winters) exchanges moisture within a single chamber. An HRV or ERV will recover up to 85% of the energy from outbound air, so your heating or cooling system will have to work less. When combined with the effective sealing of air leaks, these systems remove stale, moist air from every room in your home and replace them with fresh filtered air. Unlike exhaust only fans, HRVs and ERVs exchange an equal amount of inbound and outbound air. This is important, because the vacuum caused by "outbound only" fans may draw cold or moist air, or even radon gas, into your home through cracks and pores. In addition, installing an HRV or ERV will bring in fresh, filtered air at a rate you determine and exhaust stale air, moisture and pollutants while recovering up to 85% of your heating or cooling energy.

Living by the Numbers

ASHRAE recommends a minimum ventilation rate of 15 cubic feet per minute (cfm) per person (or .35 air changes per hour), whichever is greater. That means introducing fresh or filtered air equal to just under one-third of the total volume of air in your home every 60 minutes or more than 8 complete air exchanges per day. To put this rate of exchange into perspective, an older home without insulation or weather-stripping might have as many as 8 air exchanges per hour. If that air is replaced during heating or cooling season, that's a lot of energy consumption.

How do you find out how your home's ventilation rate stacks up? *The easiest and most accurate way is to have an energy audit performed in your home which includes a blower door test. A blower door will help you determine the air leakage problems you face in your home and help you determine the costs and benefits of sealing air leaks.* For example, if your reading is over 3000 cfm, it is likely that a thorough job of air sealing will yield significant energy savings. On the other hand, if your reading is less than 1500 cfm, your house is relatively tight and an air sealing project may not be your most effective initial step.