energy saver

Consumer Guide to Home Ventilation

Ventilation refers to the exchange of indoor and outdoor air. Without proper ventilation, an otherwise insulated and airtight house will seal in harmful pollutants, such as carbon monoxide and moisture, that can damage a house.

Proper ventilation helps keep a home energy-efficient, safe, and healthy.

Why Ventilate?

Gases from combustion appliances, like stoves and fireplaces, can accumulate in a poorly ventilated home and threaten your health and safety. Excessive moisture in the home can also threaten your health, and can lead to mold growth, ruined insulation, and structural damage. Additionally, elevated levels of humidity can make cooling equipment work harder, leading to more costly energy bills.

The concept of ventilating a home applies air-moving devices and actions to the structure of an existing house or the design of a new one.

There are three types of home ventilation:

1. Natural ventilation is uncontrolled air movement from windows, doors, or cracks in the home. This used to be the most common ventilation method of allowing fresh outdoor air to replace indoor air in a home, and can still be found in most older homes.

2. Spot ventilation controls air movement by using localized exhaust fans to quickly remove pollutants and moisture at the source. Common household examples include range hoods over stoves and bathroom exhaust fans. Spot ventilation is typically used with one of the other ventilation types and can be used to improve the effectiveness of natural ventilation. If both spot and natural ventilation together do not meet your home's ventilation needs, then you should consider a whole-house ventilation plan.

CARBON MONOXIDE (CO) DETECTORS

Carbon monoxide detectors are highly recommended for homes with any fuel-burning appliances because they sound alarms when CO readings reach potentially dangerous levels. Detectors should be installed in bedrooms and in rooms with a direct connection to combustion appliances, such as kitchens, basements, and rooms with space heaters.

We recommend that you test your detectors on a monthly basis.

3. Whole-house ventilation systems provide controlled, uniform ventilation throughout the house. One or more fans and duct systems may be involved to remove stale air from the home and/or supply fresh air into the house. The systems may be exhaust-only (relying on leakage into the building for fresh air), supply-only (relying on air leakage from the building to remove stale air), or balanced systems that include both exhaust and fresh air intake components.

Combustion Appliances

Combustion appliances – appliances that burn natural gas, propane, oil, kerosene, or wood – are used in millions of homes and often prove more efficient and cost-effective than electric appliances.

Remember to carefully install and maintain combustion appliances for safe and efficient operation. Their exhaust gases must be directly vented outside. Otherwise they can leak or release combustion products, including deadly carbon monoxide (CO), a colorless, odorless, deadly gas produced as a byproduct of the combustion of fossil fuels, inside the house.

Avoiding Moisture Problems Means Good Ventilation

When moist air encounters a colder surface, some of the moisture will condense and become a liquid. This happens on the surface of an iced tea glass, which is why you need a coaster to avoid water damage to a wooden table. In a similar way, moisture condensing inside a wall or in the attic can lead to wood rot and the growth of mold. To avoid moisture problems and ensure good ventilation, follow these steps:

Stop air leaks

Home moisture issues often directly relate to uncontrolled air flow where warm, moist air comes into contact with cold surfaces, causing condensation. Seal all air-leakage spots between living spaces and other unconditioned parts of the house, such as attics, basements, and crawl spaces. Insulation alone cannot prevent moisture problems.

Control water

Minimize the chance of water entering your house by keeping the roof in good condition. Check caulking and flashing around windows, doors, tubs, and showers. Clear roof gutters of debris and drain moisture away from the house.

Ventilate indoor moisture

The materials used in building a new 2,000-square-foot home contain about six tons of water that are released, especially during the first year. Inhabitants of a home also generate moisture when they cook, shower, and do laundry. Just by breathing and perspiring, a typical family adds about three gallons of water per day to their indoor air. If a clothes dryer is not vented outside, or if the outdoor vent is closed off or clogged, all that moisture will enter the living space, too.

- Kitchen and bathroom vents should lead directly outside and never vent into the attic, where moisture can cause serious problems and raise potential health risks.
- Consider adding controlled ventilation after you air seal. It may be necessary to provide fresh air to avoid buildup of stale air and indoor air pollutants. Special air-to-air heat exchangers, or heat-recovery ventilators, can do this.
- Replace noisy vent fans with efficient, quiet ENERGY STAR® models.

Other ways to remove moisture from the home

- A dehumidifier can effectively reduce moisture levels (though it will increase your energy use).
- A humidifier can provide comfort during the winter months, but use it only in rooms that have sufficient air flow to ventilate the room properly and prevent moisture issues.

Condensation, even in the form of ice, can develop inside of drafty windows.

FURTHER READING

Energy Saver: Air Sealing
energy.gov/energysaver/weatherize/air-sealing-your-home

ENERGY STAR on Duct Sealing
energystar.gov/campaign/heating_cooling/duct_sealing

Home Ventilating Institute
hvi.org

Financial Incentives
Tax credits, incentives, and rebates may be available in your area. Please visit energystar.gov/about/federal_tax_credits for more information.