

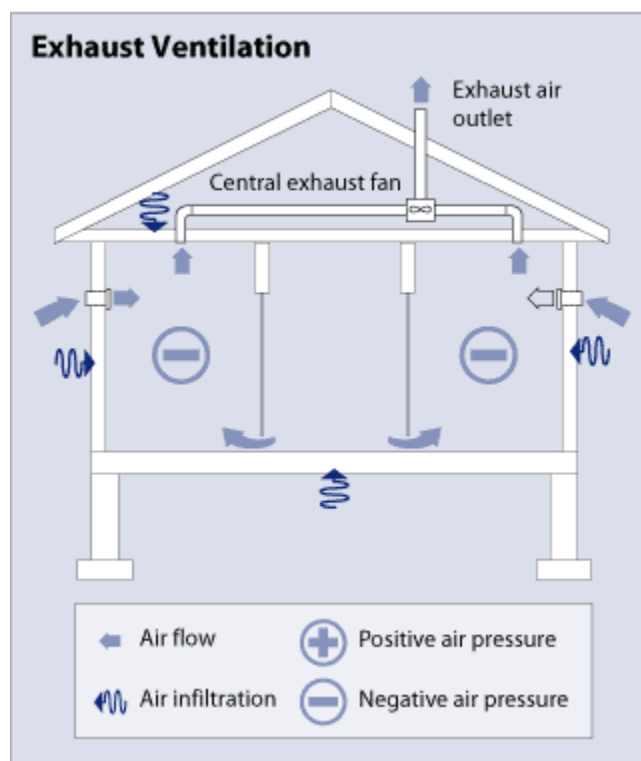
U.S. Department of Energy - Energy Efficiency and Renewable Energy Energy Savers

Whole-House Exhaust Ventilation Systems

Exhaust ventilation systems work by depressurizing the building. By reducing the inside air pressure below the outdoor air pressure, they extract indoor air from a house while make-up air infiltrates through leaks in the building shell and through intentional, passive vents.

Exhaust ventilation systems are most applicable in cold climates. In climates with warm humid summers, depressurization can draw moist air into building wall cavities, where it may condense and cause moisture damage.

Exhaust ventilation systems are relatively simple and inexpensive to install. Typically, an exhaust ventilation system is composed of a single fan connected to a centrally located, single exhaust point in the house. A preferable design option is to connect the fan to ducts from several rooms (preferably rooms where pollutants tend to be generated, such as bathrooms). Adjustable, passive vents through windows or walls can be installed in other rooms to introduce fresh air rather than rely on leaks in the building envelope. However, passive vents may be ineffective because larger pressure differences than those induced by the ventilation fan may be needed for them to work properly.



Spot ventilation exhaust fans installed in the bathroom but operated continuously represent an exhaust ventilation system in its simplest form.

One concern with exhaust ventilation systems is that they may draw pollutants, along with fresh air, into the house. For example, in addition to drawing in fresh outdoor air, they may draw in the following:

- Radon and molds from a crawl space
- Dust from an attic
- Fumes from an attached garage
- Flue gases from a fireplace or fossil-fuel-fired water heater and furnace.

This can especially be of concern when bath fans, range fans, and clothes dryers (which also depressurize the home while they operate) are run when an exhaust ventilation system is also operating.

Exhaust ventilation systems can also contribute to higher heating and cooling costs compared with [energy recovery ventilation systems](#) because exhaust systems do not temper or remove moisture from the make-up air before it enters the house.

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Reading List

- *Whole-House Ventilation* ([PDF 399 KB](#)). (December 2002). DOE/GO-102002-0778. U.S. Department of Energy.

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