



Improve Indoor Air Quality with Active Ventilation

Builder Guide



DESCRIPTION

An active ventilation system is installed in a home to continuously exhaust stale air and bring in fresh outdoor air. Active ventilation allows for tight house construction and improves occupant comfort. Without active ventilation, air-tight construction can cause accumulation of odors, humidity problems, and even building related illnesses.

Many builders don't understand why it's better to seal a house tight, then bring in outdoor air. The answer is **Control**. In a typical home, fresh air enters the house through cracks, unsealed joints and penetrations, intermittently depending on the severity of the weather. Too much fresh air enters the house in cold weather - causing uncomfortable drafts and high heating bills. Not enough infiltration occurs in mild weather, resulting in poor indoor air quality. Typical HVAC systems only re-circulate stale air. They heat or cool the air to a comfortable temperature, but indoor pollutants, moisture, and odors can still accumulate. Active ventilation along with tight construction reduces these pollutants, and can make a house both comfortable and energy efficient.

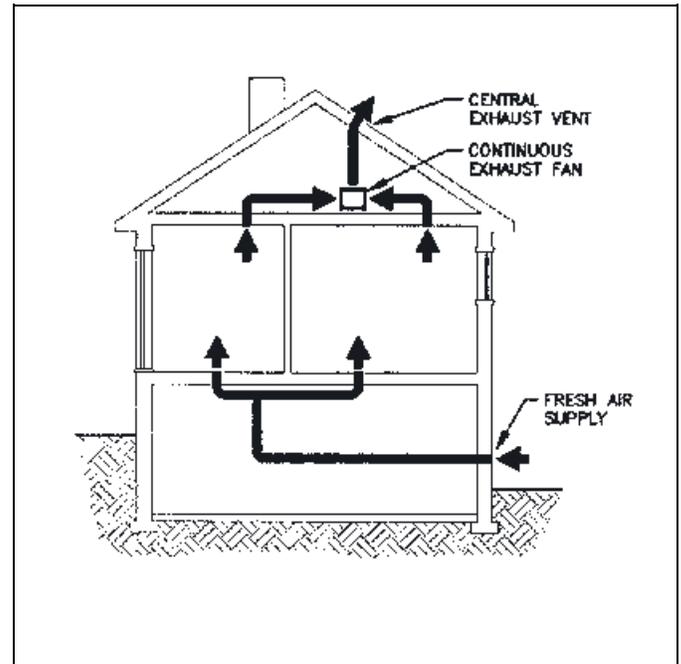
Two general types of active ventilation are available: Continuous Exhaust and Heat Recovery Ventilation. Active ventilation systems typically use central fans to pull outside air into and/or out of a house. Heat Recovery Ventilation (HRV) systems incorporate a heat exchanger for additional energy savings. HRV's can either be dry (sensible) or moisture (latent) exchanging (Total Energy Recovery) devices.



BENEFITS

Look for a comfortable, energy efficient house with active ventilation to increase customer satisfaction, reduce callbacks, and increase referrals. This can

Active Ventilation



only increase your business and your profits.

Active ventilation improves health.

Stale air can make people sick. It can be responsible for symptoms such as headaches, drowsiness, and respiratory problems. Rather than counting on "accidental" ventilation, which is weather dependent, active ventilation assures occupants always receive a continuous flow of healthy fresh air.

Active ventilation improves comfort.

The most common comfort complaints are related to drafts. Active ventilation systems combined with tight construction minimize uncomfortable drafts. Occupants experience a steady stream of clean fresh air evenly distributed throughout the house. And fresh air is easier to breathe.

Active ventilation reduces odors.

Active ventilation systems exhaust stale air and built up odors. Outdoor air is then drawn into the house to continually maintain a fresh indoor environment.

❑ Active ventilation is affordable.

Continuous exhaust ventilation systems often replace several existing bathroom fans with a single central fan. These central systems can cost the same or little more than conventional bathroom exhaust fans. Heat recovery systems cost much more, but offer additional energy savings and comfort in cold and humid climates.

❑ Active ventilation assures homes meet industry standards.

The American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) published a ventilation standard for acceptable indoor air quality, Standard 62-1989. It requires 0.35 air changes per hour (ACH) or 15 cfm (cubic feet per minute) per person of fresh air for residences during all occupied hours. Active ventilation is the only way to guarantee this ventilation rate, even in leaky buildings.



INTEGRATION

❑ Climate determines which ventilation systems are most effective.

Houses in cold climates benefit most from heat recovery since the temperature difference is higher between the outdoor and indoor air. The duration of the heating season is also an important factor. The heating and cooling season in temperate and hot/dry climates are too short or mild to justify heat recovery. A continuous exhaust system is best in these climates. In hot/humid climates, the primary concern is humidity control; Energy Recovery Ventilators (ERV's) are best suited for hot/humid climates, because they reduce the humidity of the incoming fresh air.

Ventilation Systems and Your Climate

Climate	Continuous Exhaust	Heat Recovery	
		Sensible	Total Energy
Cold		✓	
Temperate	✓		
Hot/dry	✓		
Hot/humid			✓

❑ Air-tight construction and active ventilation must be integrated.

A tight building envelope (measured infiltration less than 0.35 ACH) and Active Ventilation must be

integrated. Neither is effective without the other. See fact sheet on "Preventing Air Leakage" for details.

❑ Inefficient combustion heating appliances are incompatible with some ventilation systems.

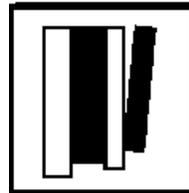
Inefficient atmospheric vented heating appliances can be back-drafted by exhaust-only ventilation systems. Continuous exhaust (CE) systems with a fresh air supply duct are designed to ensure this does not occur. If CE ventilation is used without a fresh air supply duct, only direct vented furnaces and hot-water heaters should be used.

❑ Installation requires coordination between contractors.

The HVAC contractor usually has the lead role in the installation of active ventilation systems, but electrical and plumbing contractors may need to be involved in ventilation system installation as well. For instance, most HRV's can generate condensate, which requires a drain connection.

❑ Fresh air intake should be carefully placed to avoid contamination.

If the fresh air intake is positioned near a pollutant source such as a chimney, a vent stack, a dryer vent, or a busy street, the air supply will not be fresh. Careful placement of the fresh air intake is critical for a properly designed ventilation system.



RESOURCES

- ❑ Understanding Ventilation (John Bower), 1995. The Healthy House Institute, Bloomington, IN. Available at 1-800-346-0104.
- ❑ Energy Efficient Florida Home Building (Florida Solar Energy Center), 1992. Available at 407-638-1000.
- ❑ Builder's Manual (Canadian Home Builder's Association - R2000), 1994. Ottawa, Ontario. Available at 1-800-346-0104.
- ❑ Moisture Control Handbook: Principles and Practices for Residential and Small Commercial Buildings (Lstiburek and Carmody), 1993. Van Nostrand Reinhold, New York. Available at 1-800-346-0104.