



Home comfort news  
for the customers of  
Atlas Air & W. Skerratt

# An Engineer's Opinion

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## Editorial

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President

## A breath of fresh air

Over a thousand years ago, Norse carpenters faced the challenge of long Scandinavian winters by building huts with thick sod walls and only two openings: a door and a hole in the roof. They called this hole the *vindr agua*—literally, the wind's eye—because it served as a portal for the wind to blow in and out. (Later, British carpenters adopted this term and modified it to "window".) The Norse builders' approach to ventilation was crude, but they had right idea: if you're going to live, cook, and keep warm in tight quarters, you're going to need fresh air.

Eventually, builders in the Middle Ages modified the original hole-in-the-hovel model of ventilation. They added glass windows that opened, chimneys that vented smoke, and they left a few gaps for air to find its way in and out of the house. Remarkably, from that point on, household ventilation didn't change much until roughly 25 years ago when the energy crisis hit. Faced with rising fuel costs, homeowners reached for their caulking guns and builders began to construct homes with energy efficiency in mind. Today most of us live in homes that have either been tightened up or were built tight to begin with.

The downside of tight houses is that they conserve the by-products of everyday living

along with the heat. This is something those Old Norse hut-dwellers would have understood, and they didn't have to worry about moisture from the bathroom or the innumerable household chemicals we have in our homes today. As modern tight-house dwellers, we *do* have to worry about these pollutants because they can damage our homes and our health. But we also have the same cold winters that drove people to tighten up their homes to begin with. Thus our dilemma: how do we get fresh air inside without wasting a lot of energy?

The answer is whole-house ventilation. Developed in the last 15 years or so, whole-house ventilation systems exchange stale indoor air with fresh outdoor air several times a day. The technology is designed to conserve as much energy as possible.

Good ventilation is an essential part of a healthy indoor environment, so we've devoted most of this issue of *An Engineer's Opinion* to the subject. For those of you anticipating the hot summer ahead, we've also included some information on our new, environmentally friendly air conditioners. As always, if you have any questions, please call.



### About An Engineer's Opinion

*An Engineer's Opinion* is published to assist homeowners in creating the healthiest, most comfortable environment in their homes at the most reasonable cost. If you have questions, criticism, or input, we want to hear them. Please call me personally at (905) 279-3440 or e-mail me at [rgrochmal@atlasair.ca](mailto:rgrochmal@atlasair.ca).

*Roger Grochmal*

# Airing it out: a guide to ventilation

**G**ood ventilation is the single best way to alleviate indoor air pollution, but you may be skeptical about the risk associated with exposure to indoor air pollution. This is understandable given that poor indoor air tends to cause general symptoms, like headaches, dizziness, and fatigue, which might easily be dismissed as the flu. But studies show that indoor air pollution poses a real and well-documented threat to your health; one recent survey demonstrated that 24% of people who thought they had the flu were actually suffering from carbon monoxide poisoning. Ventilation is a big topic, so we've assembled the most important things you need to know about venting your indoor air.

## What's in your air?

Not everyone is allergic to cat dander, but certain contaminants, like airborne chemicals, aren't good for anybody. Volatile organic compounds (VOCs) are particularly hazardous. These are gases, such as formaldehyde, which are given off by textiles, furniture, paint products, pesticides, and cigarettes, to name a few sources. Probably the most common and serious indoor air problem is excessive moisture. Humid air fosters the growth of a variety of nasty microscopic creatures, such as bacteria, viruses, dust mites, and worst of all, molds. Molds can trigger allergies, exacerbate asthma, cause other serious diseases with their natural toxins, and rot both your possessions and your home's structure.

## Kinds of ventilation

**Passive ventilation** occurs when air moves naturally in or out of the home through an open window or gaps in the building envelope. This kind of ventilation is local, occurring only in the areas of your home where the openings are. Because it depends on a pressure difference between the inside and outside of the house, passive ventilation is unreliable. An open window will bring in some fresh air, but it won't provide sufficient ventilation to remove contaminants that are continuously produced in the home.

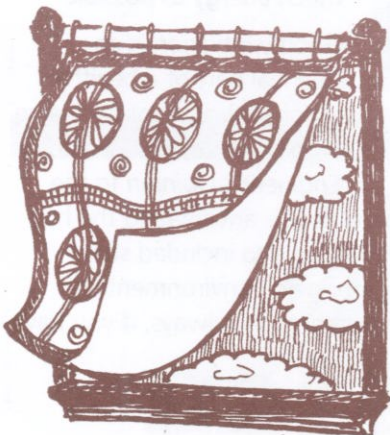
**Local mechanical ventilation** is provided by exhaust fans in specific rooms of your home, such as the kitchen or bathroom. Exhaust fans remove moisture and fumes directly from these areas. They don't recover any heat before they exhaust the air,

which is a concern in the winter. They also don't replace the air they exhaust with fresh outdoor air.

**Whole-house ventilation** works by exchanging the entire volume of indoor air with fresh outdoor air several times a day. To save energy in the winter, most of the heat is extracted before indoor air is exhausted outside. The fresh air coming in passes through the furnace's filter and is forcibly moved through the home by the furnace fan. Whole-house ventilators will exhaust airborne contaminants. The purity of the incoming air will depend on the kind of filter or other air-cleaning device you have installed.

## Whole-house ventilation products

Whole-house ventilators are generally available as heat-recovery ventilators (HRVs) or energy-recovery ventilators (ERVs). HRVs extract heat from the out-going air to conserve energy. The ERV is the HRV's summer counterpart. It has a humidity barrier that limits moisture coming into the house. Since an air conditioner's hardest job is to remove humidity before it cools the air, an ERV would reduce the load on a central air conditioning system. At Atlas, we offer the vanEE Gold Series of whole-house ventilators. These ventilators are fully convertible from HRV to ERV mode, an important feature because we have hot and cold seasons with swings in humidity. The ERV core keeps out humidity in the summer, but this core can be exchanged for an HRV core in the winter to allow accumulated indoor moisture to vent outside.



## What you need to know about negative pressure

Recently we had a customer who called us because he was worried about a "combustion" smell in his home. Concerned that the fumes were coming from the furnace, he came to us prepared to replace it. When we went to his home, we inspected the furnace and performed a blower-door test, which lets us track where air flows in a house.

To the homeowner's surprise, the combustion smell wasn't coming from his furnace at all, but from his garage. Like many other energy-conscious homeowners, this man had sealed up leaks around his home, but had overlooked the door to his garage. As a result, the oil and solvent fumes from his recently undercoated car were leaking in through the spaces around the garage door.

Every house contains appliances that exhaust indoor air, such as clothes dryers, water heaters, fireplaces, and standard furnaces. When these appliances operate, they create negative pressure (a vacuum) in the house. A loose house compensates for this by drawing air in through gaps around doors and windows. But as a house becomes more tightly sealed, its sources of replacement air become limited. Under very negative pressure, the combustion gases from a standard furnace or gas-fired water heater might back-draft into the house. Negative pressure is

a problem that most often occurs when people finish their basements, because most air-hungry appliances are located in the basement where they would have had access to air leaking in from basement sill plates prior to the finishing.

When a professional ventilation contractor installs an HRV or ERV, he should balance the system so that enough air is drawn in to compensate for the volume going out. If you already have whole-house ventilation, it's a

good idea to ask your contractor how the air balance will be affected before you undertake a big renovation, particularly in the basement.

It's worth noting that high-efficiency furnaces have a closed combustion system and no chimney, which means that even in a house with negative pressure, the furnace won't back-draft dangerous combustion fumes, such as carbon monoxide.

## The limits of ventilation

Good ventilation can go a long way towards improving indoor air, but it can't completely solve every air quality problem. Many people set out to improve their indoor air quality because they have a specific complaint, such as a persistent moldy smell, or an allergy that only seems to flare up in the house. Before you shop for ventilation, it's important to try to discover the source of the problem and reduce it as much as possible.

For example, a strong moldy smell in the basement usually indicates a moisture problem. In this case, ventilation would only help to control the symptom. To fix the problem you would need to figure out where the moisture is coming from, such as a cracked foundation or poor site drainage. Since these are serious problems that could lead to expensive repairs if untreated, it would be a bad idea to simply mask the symptoms with ventilation.

People with allergies should find out what they are allergic to. Once you have this information, try to control the allergens at their source.

## The bottom line

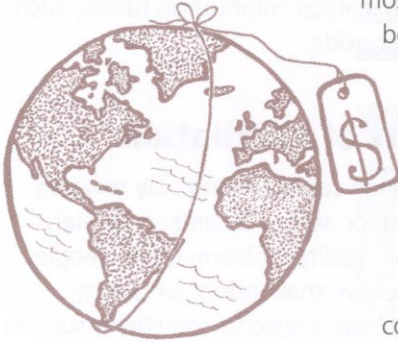
Ventilation will replenish the oxygen in your home and relieve the build-up of many harmful contaminants. But to truly solve a specific air quality problem, you may have to make some choices, such as asking a smoker to step outside or getting rid of your favourite woolly blanket. If you think you have an air quality problem and you're not sure what to do about it, call us. We can help.



## The latest in environmentally-friendly air conditioners

A few years ago, the refrigerants used in automobile air conditioners, refrigerators, and freezers were phased out because of their harmful effects on the Earth's ozone layer. R-22, the refrigerant used in most residential air conditioners, is also due to be phased out within the next 8-13 years or so. It is less harmful than other refrigerants but it still contains chlorine, the principal element responsible for damaging the ozone layer. R410a, an alternative refrigerant that does not contain chlorine, is replacing R-22.

For years, Carrier worked to design an air conditioner that could use R410a because it cannot be used in conventional air conditioners.



In the spring 2000 issue of *An Engineer's Opinion* we wrote "Cooling technology doesn't have to cost the earth" in which we introduced Carrier's first successful line of air conditioners that use Puron®, Carrier's label for R410a. Carrier has recently added a second model to its new line-up, the 38TPA.

Today, other manufacturers are working to develop R410a-compatible air conditioners. One of our favourites is the Ruud Achiever Prozone® (you can read more about it below). By 2015, most new air conditioners will be produced with R410a. This is good news for the environment, and since the new generation of air conditioners is more quiet and efficient, this is also good news for you.

## The Ruud Achiever Prozone® air conditioners deliver comfort and value

Ruud has long been one of our favourite suppliers because they have always produced air conditioners that are efficient, quiet, reliable, and very cost effective. This year, they've introduced their new Achiever Prozone® R410a-compatible air conditioner to Canada. The Achiever Prozone® delivers the same quality and value that we've come to expect from Ruud.

The Achiever Prozone® air conditioner is efficient at 12 SEER. It has an evaporator coil with a special valve that meters the refrigerant used by the compressor. This helps to prolong

the life of the air conditioner. When you purchase the Achiever Prozone® you get a 10-year manufacturer's parts warranty on the compressor and a full 5-year manufacturer's warranty on all other parts in the unit. You'll also get the Atlas 60+ labour warranty when you purchase our Blue Plan maintenance contract. As always, you can expect the famous Atlas system evaluation and installation to ensure that you get the most cooling to the areas of your home where you need it the most.

**Save \$100 per Ton**  
when you purchase a  
**RUUD Achiever Prozone®**

Offer expires May 31, 2002.  
This offer may not be combined  
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