THE STRAIGHT EDGE

HEALTHY HOMES: BREATHING BETTER AND SAVING MONEY WITH A HEAT RECOVERY VENTILATOR (HRV)

A four-year-old farted in my face.

And laughed.

As a parent of the aforementioned young child, this is perhaps a rite of passage – I'm now fair game for my kid's sense of humour.

Take a breath, tell me if you can smell it. The air, not the fart.

The air you are breathing at home is contributing to health issues now and to possibly major health problems or even death later. (Wow, that escalated quickly.) You may think that you're breathing clean air, but it can have literally hundreds of harmful chemicals and invisible organisms in it. After reading this article, you will understand the importance of improving the quality of the air in your home and also learn what action to take that will improve your life now and decades from now.

Indoor air quality (IAQ) is critical to health and to comfort. A variety of acute, seasonal, or chronic mental, respiratory, or other symptoms are partly or wholly a result of poor indoor air quality in your home. Poor air quality usually stems from indoor air pollution and leads to headaches, fatigue, irritation of the ears/nose/throat, concentration difficulty, dizziness, watery eyes, coughing fits, chronic sneezing, dry throat, and sinus congestion.

Indoor air pollution is usually caused by the accumulation of contaminants from various sources inside a home due to inadequate ventilation. Proper ventilation is the adequate supply and movement of outdoor fresh air into, through, and out of homes to help improve indoor air quality. It removes pollutants by replacing stale air with fresh, outside air. It turns out there's a fairly simple way to achieve this.

Some people can become sensitized to biological or chemical pollutants after repeated or high-level exposures. Serious health problems for you or for your family resulting from the current IAQ may present themselves later in life whether or not you currently have symptoms. For example, asbestos and radon lead to cancer only after years of exposure. Let's look at what indoor pollutants there are.

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THE POWER OF CONSISTENCY

Are you the kind of person who starts off strong but can't find the motivation to finish with the same focused effort? Do you find yourself beginning a massive project only to let it taper off and fade away in the background? Sometimes it seems like the things we do day to day don't have a large impact on the overall picture. However, small steps have the power to help us reach bigger goals, when you continue to consistently make these small actions.

Let me tell you a true story about a young woman named Angela. When she started on her book, she sat down to write every day. Often, she wouldn't get much accomplished. Some days she would just sit at her keyboard, writing what felt like nonsense. Other days the words flowed easily. On average she wrote between 250 and 300 words a day, not even a full-length article. One day she looked down and realized she'd written a total of 90,000 words. She was shocked! Her work added up and the first draft of her book was complete.

Although 200-250 words a day did not seem like a lot of progress, the fact was she consistently wrote every single day for a year, and that's what helped her accomplish her goal. And that kind of determination is the power of consistency. Think about it: is there something you can spend a small amount of time each day working on? If yes, a year from now, what will you have accomplished?

Being consistent allows us to work our creative muscles. When you're doing something every day, it becomes a habit that gets progressively easier. Regular practice helps us to optimize our skills over time. Consistency builds trust and helps others to believe in us, knowing that we'll show up. Whether it's a weekly blog post, monthly newsletter or follow-up calls with clients, you can make it happen. Consistent follow-through gives you the power to accomplish great things by sticking with them day in and day out.

Your challenge is to choose an ambitious goal that feels worthwhile, break it into manageable pieces or a regular routine, and follow through. Let us know what you choose, and how far your consistent effort takes you!

ICONIC BUILDING OF THE MONTH

Borgund Stave Church

Each month I select a building that captures my attention and holds me in adoring awe.

This building in Laerdal, Norway - a museum since 1868 - was one of over 1000 Church of Norway parish churches built by the Norse at the beginning of the 13th century but is one of only 28 stave churches currently still standing.

Originally dedicated to the Andrew the Apostle, the church is decorated with many carvings whose meanings are unknown due to their age and state of erosion. However, the stylistic dragon-heads rising from the roof ridges are similar to those on the prows of Norse ships.

The wooden roof shingles, vertical wood boards (staves) on the walls, and various carvings were treated with a tar derived from charred pine - the source of the near-black finish. The timber structure was built on a stone foundation, and this has helped prevent moisture from rotting the building.

The interior is a small basilica layout with an apse (half-dome) at the end. It's mostly empty apart from some artifacts from the 16th - 18th centuries and one medieval soapstone font.

The church is a tourist attraction, and visitors may visit the interior.

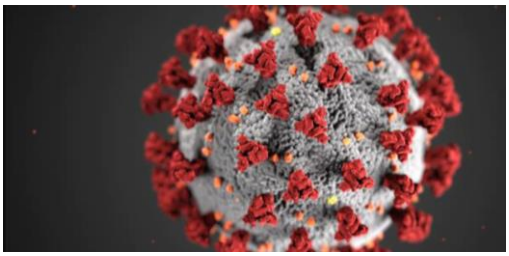
JUST HOW TOXIC IS YOUR HOME'S AIR?

The list of chemical indoor pollutants at home is STAGGERING. Chemical pollutants include vapours from paints, strippers, solvents (cosmetics); cleaners (general purpose or personal hygiene); formaldehyde (cabinetry and tobacco smoke); benzene and acetaldehyde (laundry); deodorizers; and disinfectants.

Oil lamps and natural gas-fired appliances like fireplaces, stoves (especially when frying), furnaces and water heaters emit nitrogen dioxide, carbon monoxide, sulfur dioxide, acrolein, hydrogen cyanide, soot, and volatile organic compounds (VOCs). Scented candles emissions are similar to those of diesel: known carcinogens such as alkenes, acetone, benzene, and toluene; and diesel-like soot.

Laundry, carpets, fabric, foam chair cushions, pillows and mattresses are constantly shedding microplastics but also attracting dust mites that produce allergens. Microparticles are rubbed off high-touch surfaces such as doorknobs and various handles and switches. Radon is a radioactive gas that comes from the breakdown of uranium in soil and rock, can accumulate to high levels, and become a risk to your health; it can't be seen, tasted or smelled, but noteworthy emissions are found in most parts of British Columbia.

Indoor pollution also includes biological contaminants (bioaerosols) such as mold, bacteria & viruses (from family or visitors), mites, dust, and dander (pets). Carbon dioxide from people can build up to unhealthy or unsafe levels without enough fresh air.



Don't forget about the outdoor pollution from air which enters through joints/cracks/holes in the walls/floors/ceilings and around windows and doors or through open windows and doors. In comes automobile exhaust, tire rubber dust, brake dust, exhaust from bathrooms and kitchens and laundry of adjacent buildings, microscopic insects, pollen, and wildfire smoke.

When you think about all that pollution, it's astonishing that we're not deathly sick all the time. It's like a villain's overcomplicated recipe for poison gas. Pollutant concentrations can remain in the air for long periods after some activities. The resulting health effects may be immediate or *occur only after years*; they may be short-term or become chronic. When the air quality in your home or office is so bad that it can affect the health of those inside, we call it 'sick building syndrome' or 'toxic building syndrome'.

But wait, there's *more*. A damp house is a breeding ground for bacteria and harmful organic matter, a haven for infectious illnesses that compromise your respiratory system. Excessive moisture can be generated by cooking, by laundry, by bathing, or by overcrowding (too many people breathing and perspiring).

How well do you think your home performs?

Take the
Home Performance Assessment™
https://www.resourcesfordesign.com/dc-mfhpa-opt-in-1

RENOVATING OR BUILDING A HOUSE?

STEP 1 – RATE YOUR HOUSE ON THE ULTRA PERFORMANCE SCALE

Renovating or rebuilding your aging, underperforming house is the perfect time to make your home LEGENDARY. Like a super high-performance car, a "Legend Home" is an ultra-performance home. You get superior comfort, precise climate control, super durability, and enhanced live-ability.

If your house is less than 30 years old but starting to need more work every year maybe your house is a "lemon". ***Most homes are.***

A "lemon" leaks heat in the winter and overheats in the summer. One of the big clues you've got a "lemon" home is it's becoming costlier to run and maintain. Another is your comfort is suffering more during really bad weather.

Think of it like a rusty old clunker car that didn't cost as much to buy but is getting expensive to keep on the road especially since you can't always rely on it to get you where you're going.

Daniel Clarke
Architect AIBC

My name is Daniel Clarke, and I provide education, tools, and advice for people who want to know what it's like to own and live in a climate-resilient ultra performance "Legend Home". Expensive renovations and even newly built homes usually underdeliver on performance. Owners assume they'll get a high-performance home, but by using inferior materials and typical, sub-par design they end up with a "lemon".

Does an ultra high-performance home cost more? Upfront it may slightly – or not at all – but when you factor in the total costs of running a lemon, the ultra high-performance home offers the better value.

I made this scorecard to help you start to view your house through the lens
This highlights some of the easy-to-check characteristics of iconic perf
Give yourself a score for your home. Next, rate on the spectrum how you th
rank. Then, call me to discuss.

PRE-RENOVATION HOME PERFORMANC

Give yourself full points for each statement that's TRUE, but ad

EXTERIOR

___ 1 pts You've never had stains forming from rainwater running dow siding materials meet or intersections with the roof.

___ 2 pts All of your windows start at least 3' above the floor.

___ 2 pts Most of your windows have a floor or roof overhang above.

___ 2 pts If you have a balcony, is it supported by posts.

___ 2 pts If you have a balcony or deck, is it covered with pavers or ce

___ 5 pts If you have a balcony or roof deck, is the railing screwed to th

___ ** If you don't have a balcony or roof deck, give yourself 4 pts.*

(continued on next page)

THE SIMPLE SOLUTION TO CLEAN, HEALTHY AIR

Increasing **ventilation** in your home reduces the levels of indoor pollutants and prevents the buildup of humidity.

So if more fresh air prevents the buildup of all those indoor pollutants and excessive moisture, *why isn't everyone doing it*? First, it's a lack of awareness. Most people don't realize how saturated with petroleum-derived compounds our lives have become, don't consider the amount of bioaerosols, don't understand how these all fill the air, and don't realize the magnitude of their health hazard.

The second reason is cost. Whether in winter or summer, the cost to heat or cool an entire house's volume of air several times an hour would be exorbitant. Too much mechanical ventilation dries out the air and can create drafts. Even if enough ventilation was provided to remove indoor pollutants, a typical house is leaky and still suffers from outdoor pollution.

What's the fix? Continuous mechanical ventilation from a **heat recovery ventilator** (**HRV**) combined with **airtight construction**. That sounds really boring, but it's actually amazing. Why? It runs all day, year-round, pulling old air out and pumping in fresh, filtered air to remove indoor contaminants continually. A HRV transfers heat from exhaust air to the incoming fresh air (the intake) in winter, so it (re)captures 85-90% of the heat you've paid for.

A typical HRV is the size of two large suitcases, only as loud as a refrigerator or quiet bathroom fan, and consumes about as much as a 100W light. Certain HRVs can also recapture the humidity to prevent dry air and ensure the indoor air "feels" comfortable.

In summer, a HRV system instead moves heat from the intake to the exhaust in a more roundabout manner, but the efficient cooling capability renders a separate A/C system unnecessary.

With a HRV system installed in your current or new house, you will breathe easier both literally and mentally as you can rest assured you've removed a big risk to your family's future health. You will be breathing clean air at a healthy and comfortable temperature and relative humidity. You may feel more energy, you will be free of pollutants that cause future health problems, and one or more current seasonal or chronic symptoms may disappear. Without a HRV system in your home, your children may develop health troubles before they're adults, or current symptoms may worsen. You may develop a number of symptoms - or more symptoms - as you age and as your health deteriorates.

To incorporate a HRV effectively, you will need to consult a ventilation professional to ensure that the system provides the correct ventilation. My Deep Blue Design™ process optimizes the integration of this system and others into the design of your house. For a HRV system to function well, you also need to ensure your house's walls/floors/roof/windows are airtight; I can advise on this as well..

Do you know someone who would benefit from a HRV system?

Tell them to book a

Diagnosis Session

https://www.resourcesfordesign.com/dc-expert2-opt-in-1

BUILDER'S BOX Monthly Tip for Builders

Why the Airtightness Targets in the Step Code Are A Big Deal

BC Housing's Guide to Achieving Airtight Buildings notes "…experience has shown that the majority of air leaks occur at joints and interfaces between these air barrier elements."

Airtightness is important for several reasons, but from a quality construction standpoint, energy efficiency is really NOT the biggest reason. The biggest threat to a building is moisture in the walls and roof – either rainwater leaking in or interior vapour moving out and condensing – and the biggest mover of vapour is AIR MOVEMENT.

A couple nail holes through the air barrier lets through **as much moisture** as an **entire 4'x8' sheet** of gypsum board with no poly behind it. A single 1-1/2"x1-1/2" hole (or 1/16" x 36" gap) lets in 100x as much as the whole sheet of gypsum board. Or: one nail hole per sheet of drywall is the same as leaving off the poly for half the house.

4'x8' hole cut in poly and replaced with a sheet of gypsum board

Two small nail holes through the poly

One 1.5" x 1.5" hole through the poly

One big cup of water

=

One big cup of water

10 gallon HWT

PASSIVE WISDOM – Monthly Insights from my interviews with Passive House Pros

Erik Olofsson's uncle was into prefabricated, panelized construction in Sweden. A treehugger himself, Erik discovered Passive House, made the connection and founded **Erik Olofsson Construction Inc.** to focus on high-quality builds.

Frustrations with clients? **"Passive House fatigue" can derail a project if certification isn't in the contract. A client may fold if they have to sacrifice too much. Once Passive House is off the table, then everything is open to cost-cutting and there's no longer any assurance of high performance for either energy efficiency or occupant comfort.**

Are luxury homes and Passive House mutually exclusive? **Practically speaking, a luxury house can be designed to Passive House. They're not *ideologically* compatible though; one couple rattling around in a 6000 sq.ft. house kind of defeats the spirit of the Passive House movement – efficient resource usage.**

Any pursuits beyond Passive House? **Erik loves mass timber and feels we need to be keeping track of carbon. "It's a climate imperative; we've gotta do it."**

Daniel Clarke Architect is a Vancouver-based architecture firm specializing in **ultra high-performance,** luxury, net-zero and Passive House climate-resilient homes and multi-family residential buildings in British Columbia. My PURPOSE and my PASSION are to design buildings which **create physically and psychologically healthy spaces, use resources efficiently, and are timelessly elegant**. While each project has its own, unique personality, I believe every project must respect and should restore natural systems and habitat.

My experience spans over two decades in the architectural industry in Western Canada serving a diversity of clients. I'm a Certified Passive House Designer (CPHD) and member of the Homebuilders Association of Vancouver (HAVAN) and the Canadian Home Builders' Association (CHBA).

You can find me on my YouTube channel:

CAN YOU FIND ALL OF THE SKYSCRAPERS?

CLUES
Easy today – just find the name..

Burj Khalifa
Shanghai
Ping An
Lotte World
One World
Tianjin
Citic
Taipei
Petronas
Lakhta
Wuhan

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P	V	R	I	U	V	S	L	H	L	I	N	Y	D	E

AGE STRONG.

LIVE WELL.