

GREEN TECH THE SERIES COLUMN FOR JULY 22, 2015
HEADLINE: BUILD TIGHT AND VENTILATE RIGHT

Last week, we looked at the wide range of envelope wraps for windows and doors, as well as gaps at the juncture of assembly, frame to foundation, for example. Starting next week, we will begin a series on how we accomplished the “build tight” concept in the spa. I realized when I designed the spa, as a small boutique business operation, that a conventional HRV system would be the starting point, given our entire spray foam envelope. In a home, if any level of energy upgrades is done, it’s almost a must, as well, since the occupancy is constant, unlike the spa.

A house has to breathe; your home needs fresh air. The best way to regulate indoor air quality (IAQ), if you have spent the money on controlling the loss of that expensive conditioned air, is a controlled ventilation system. You talk to the majority of energy auditors and they will agree with this statement. This concept, however, has mostly been lost on the general public, many of whom have expended their hard earned money trying to seal up their homes and are now finding out that there is a delicate balance between saving energy dollars and the overall health of the home’s inhabitants.

Traditionally, homes had a natural ventilation system; it’s called the stack effect, where air pressure from the outside ventilated up through the home because it just plain leaked around the doors and windows, up through the ceiling light fixtures, attic hatch and any number of other ceiling openings. One of the largest air exchangers in an older home was the wood burning fireplace; a great natural draft for moving air up and out. This also explains why open fireplaces are not a heat source. Older homes were, in fact, downright drafty and, in some cases, this caused air quality issues from external concerns, like the neighbour’s manure pile! This natural air flow was also unbalanced. It created very poor cross ventilation and some areas had very stagnant air flow.

I don’t remember children, when I was in school, having the respiratory infections and allergies we see in children today. In our rush to save on our heating bills, we are creating homes that lack the ability to provide fresh air. One study done by CMHC on homes in the far north, found that out of 1,000 children, nearly 300 had some form of respiratory issue. The people studied had been living, for a number of years, in homes that were sealed up tight. The study also recognized that the level of smokers in the far north is greater than in other areas of Canada and with such tight houses this could be another factor with respect to

the higher than average level of respiratory diseases there. Now, those of us in the southern portions of the country are moving to tighten up our homes. Could we learn something from our northern neighbours, who have lived in an air tight home for some years and are paying the price?

The National Building Code and section CSA F326 recommends, “residential mechanical ventilation” and, in fact, if your home is or will be built to the R2000, Greenhouse Certified, Energy Star or in, Western Canada, the Built-Green program, you must have such a system. For a number of years there was the argument that these systems wasted expensive heated air, yet recent studies show that less than 15% of the exchanged air is lost. Poor indoor air quality, mold and various allergies, are quickly becoming the topic of conversation for many parents.

In the current building code, it is a requirement that all new homes have a ventilation system, known as an HRV or “Heat Recovery Ventilation” system. This design takes air from the kitchen and bathrooms, replacing it with fresh air in the living room and bedroom and removing excess humidity and kitchen odours at the same time.

One question I have heard from some homeowners is, ‘How do we add in such a ventilation system when our basement is finished or we have limited access to our bathrooms and kitchens?’ The other concern is the cost of installing an HRV system. In a home where adding ducting is an issue, you can install an HRV in a simplified standard installation where the exhaust duct and the supply duct are fitted into the return air main duct. Provided they are separated the correct distance, this system is effective. However, nearly 75% of these that I see installed are not interlocked to the furnace fan, which has been a requirement of the National Building Code since 1995. Most of the new furnaces have multiple or variable speed fans, so this should not be an issue. The HRV must be properly balanced for air flow. Today, most systems are set for equal balance, although I do see some that bring in slightly more CFM than they exhaust. This is done to help reduce any depressurization and combustion spillage; a good thought. There is an on-going discussion with respect to the size of a home and the need to exchange the air. A large home with two occupants will not need as many air exchanges as a small home with an active family of 4 or 5, for example. Your heating/IAQ specialist should consider this when talking to you about an HRV.

The level of IAQ/mold problems in homes that our company is called in to investigate has risen three fold in the past few years. We spend up to 90% of our time indoors, it is time every homeowner took a long hard look at the quality of

the air they and their children are breathing.....300 out of 1000 children is a staggering figure, especially when you consider a retrofitted, simplified HRV system can be installed for around \$2000.00, provided the tech has reasonable access to your return duct.

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