

ASK THE INSPECTOR COLUMN FOR DECEMBER 2, 2015  
HEADLINE: DOES YOUR HOME HANDLE 45. C CHANGES?

At a recent home inspection, the clients were purchasing their first Canadian home. They had numerous good questions and one came up about the quality of homes here in Canada. They were originally from Israel where homes are not built to handle high degrees of temperature change.

When you look at the real temperature most of our homes handle, it is in fact quite amazing. If you keep the inside of your home at 20.C and it's minus 25.C outside on a typical winter night, in fact it's keeping you comfortable with a 45.C difference. Canadian building standards for cold weather homes are actually one of the best in the world.

When we have a cold snap, which is surely coming, homes change. Exposed materials slowly shrink as the temperature lowers. Most wood homes, up until the early 80's, had their 2X4 frame exposed on both the inside and the outside, with insulation between. Air barrier plastic was still in the early stages. If we get a quick drop as sometimes happens, this wood shrinkage happens more quickly and it's actually quite common to hear such a home creak and groan. The roof is, in fact, a triangle and, with so much exposed to the weather, the top of the truss and wood sheathing is cooler, while the bottom of the truss is warmer, allowing more air movement. This quick change in temperature puts considerable stress on the joints, metal plates and fasteners. In the dead of winter, I often get e-mails about noises. In fact, they can be quite loud, described often by the phrase, "It sounds like a gunshot" and it really can have a singular loud cracking noise. In 99% of the cases, there is little to worry about and, once the temperature warms up, the wood takes on moisture and returns to its normal state. Vinyl siding is well documented to make loud noises, often repeated loud cracks.

The internal systems like water pipes and heating ducts also are affected by the cold and contract and expand to a greater degree. Hence, they too, can have some noise to them that you don't hear at other times of the year. Most of these noises are noticed because the systems are attached to the frame of the home by hangers or attached to the building; their sound transfers easily.

Another area where weather makes its affects known in the interior of the home, as well as in the occupants, is in regard to the level of humidity. An average household contributes around 2-3 gallons of water into the air every day. During the winter and, especially during a cold spell, air movement into the home from the outside is cold. At 0.C, air only holds about a third of the moisture it is capable

of holding at 20.C. When this air enters the home and warms up, it takes on moisture even though no moisture has been added. The home exchanges the air through leakage, stack effect and by opening and closing doors. Dry air not only affects the occupants, it dries out furniture, wood flooring and most especially anything that is made of wood. It is well documented that, once relative humidity goes below 30 percent, the comfort level in a home decreases. Skin dries out and eyes become itchy. Once it drops to 20%, static electricity will happen and anyone with allergies will notice a difference. Keeping humidity levels in a home between 30% and 60% is the range for overall comfort and occupancy health.

The use of a humidifier in a Canadian home during the winter is almost a must and it does have benefits. It will, not only make the home more comfortable, but it will have a small, positive effect on the heating bill. Once air dries out, most home occupants will increase the temperature, whereas a home with humidified air does not require as much heat. In our home, a portable humidifier will add about 4-5 gallons a day of water to the air. While we are an open concept design, with the outside temperature currently dropping, the humidity levels are in a comfortable range. Individual room humidifiers are also effective, especially in a bedroom.

There are humidifiers that can be mounted on the ducting at the furnace and they, too, can be effective, provided they are closely maintained. Unfortunately, the foam drum style have a checkered history for operation, I have seen dozens of these over the years with leaking floats, dried up foam drums and contaminated water. The cascade type uses a cartridge that is replaced and they are, in my opinion, the better unit. That said, proper maintenance and monthly inspections in the winter make all the difference, no matter which type are used.

Comfort levels during the winter all comes down to controlling the air leakage in the home, sealing it up not only reduces the heating costs, it improves the overall comfort levels. Adding humidity to the home by means of a humidifier can add considerably to winter comfort and winter is coming.

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