GREEN TECH THE SERIES COLUMN FOR DECEMBER 9, 2015
HEADLINE: ENERGY OUT THE WINDOW?

A couple of weeks ago, I wrote a column called “Thermal Bridging 101,” in which we looked at how wood frame and insulation reflects heat loss and how it can be improved. I answered a number or reader’s questions directly and was pleasantly surprised at the interest following publication. In nearly all inquiries windows and doors were mentioned, so, this week, we look at these openings.

Heat loss calculations seem to be one of those, “who understands that?” areas of home energy evaluation. I will give you a very generic idea of this method. Without doing a complete heat loss calculation, this will give a sample average benchmark. A home located in Southern Ontario, say near Windsor, that has 380 sq. ft. of window space in the walls and older windows with an R-1 factor, double glazed in wood frames, would lose approximately 62% of the total heat required for this home. If the windows were upgraded to an R-4 factor, which most new low-e gas filled insulated window are, the factor drops to about 45%. That said, it’s impossible to relate this to heat costs. The unknown factor is the type of heating, with natural gas the most cost efficient and electric heat the most expensive.

Windows today are rated in the “U” factor for energy efficiency. U-factor is a measure of the rate of heat flow through a window. This is the inverse of the “R” or RSI factor, which is how we rate the effectiveness of insulation. For example, a double paned conventional glass window in an aluminium frame would have an average rating of 0.85. A double paned low-e window in a wood or vinyl frame rates at a U of 0.40, as an average, and triple paned low-e krypton filled window in a wood frame metal clad would rate at 0.15. Another factor that is used to rate windows is the solar heat gain coefficient (SHGC). This measures how much heat enters the home through the glass. In both cases, the lower the number, the better the window from an energy efficiency perspective. Today, replacement or new windows should be, at minimum, Energy Star rated.

Another consideration is the thermal bridging of windows. Thermal bridging means that heat or cold moves through, not only the actual glass, but the window frame itself, allowing even more energy loss. A common number used is 1/3 of an average winter heat loss is through windows and doors, depending upon the material and condition of these openings. Window sashes and frames are made from a number of different kinds of materials, ranging from standard vinyl, which

are the least expensive, up to clad wood. The top of the line are fibreglass composition, which are commonly used in R2000 or Passive Haus home designs.

If you already have vinyl, wood or fibreglass frames and the glass goes foggy or gets condensation inside, these thermopane sections can usually be removed and replaced, saving the cost of an entire new window. There are two common methods to upgrade windows in an existing home, either within the existing frames or by removal of the entire window, using the rough opening to inset new replacement windows. While similar in effort; using existing frames does make the actual window area smaller than original.

Not everyone is in the position to replace the windows in an older home, however. With winter upon us, all-be-it they say it will be a milder than usual one, the situation can be temporarily improved. One time, interior plastic storm windows do work. In fact, they work very well if installed correctly. These come in a package with double sided, self-adhesive tape and enough thin plastic to cover the window size advertised on the package. The secret here is the tape. It must be "firmly" attached to the window trim, before peeling off the top layer and stretching the plastic over the window. Here, although it may look simple, an extra pair of hands really helps. Stick the bottom first, making sure it's stretched out. Next, do the sides and, finally, the top. Once applied, take a hair dryer and shrink the plastic until tight. Not too tight, just tight. Finally, using some bath caulking, which peels off when no longer needed, caulk the space between the window trim and the wall.

Drapes and blinds are also very effective and they have an added benefit, reduction of harmful UV rays that discolor flooring and furniture. Here, the list is long and there are many options to fit most pocketbooks. To reap the most benefit, fit the blinds or shades inside the window frame. Blinds, such as the honeycomb style, are usually the most effective. Some makes allow some light to pass through.

If you have existing drapes that are on the outside of the window and you use them for decorative use, install what is known as a "Pelmet" above the drapes. Blocking the top stops the warm air from entering from above and sneaking behind the drapes. Provided the curtains fit the wall, this actually makes this space a still air area.

Light into a home in the winter is important. However, managed light is even more important as this translates into reduced energy costs. Keep your north face windows covered as much as possible and open and close drapes and shades on

the other sides of the home. In doing so, you will see the difference in your energy bills immediately.

Hopefully, that answers some of the questions coming out of the Thermal Bridging 101 column, but if you have more questions, don't hesitate to email.

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