

GREEN TECH THE SERIES COLUMN FOR MARCH 16, 2016
HEADLINE: UNDERSTANDING WINDOW TERMINOLOGY

New home builders are required to use Energy Star windows and some of the custom builders offer higher rated windows or a greater “U” value. For a homeowner who is looking to upgrade their windows, the window manufacturers have created, not only more durable products, but glazing options tailored for specific climate. Price points have improved and last year around this time the Canadian government changed the Energy Star zone rating system to where other than the lower west coast and Victoria Island, the most densely populated areas are all in zone two.

Energy Star windows must meet specific efficiency levels; this was developed by using heat degree days, a measure of annual average temperatures. The Energy Star rating on the window “indicates how well the window, door or skylight insulates against the cold and how well it uses the suns heat to supplement the heating system of a home or building” according to a recent NRCan study. Windows and doors are rated on their “U” factor or their Energy Rating (ER). The U factor is a measure of heat loss, the lower the number the slower the heat loss. The ER rating blends three factors, the U rating, potential solar gain and air leakage. Here the higher the ratings number the better. U value is described as the escape of BTU (British Thermal Units) per square foot, per hour, per degree of heat. We have grown up with the “R” factor as a benchmark and these more recent ratings can be confusing. In simple terms, the higher the “U” factor the lower the “R” value. Unfortunately, there is no conversion method to rate the ER rating. The majority of insulated windows today are Energy Star rated.

Buying replacement windows can be a daunting task and the terminology used by the window manufacturers confusing. I will explain some of the more common terms. Air infiltration is the amount of air that passes between the frame and sash; it’s measured in cubic feet per minute, per square foot of window area. Sash is the common term for the window assembly set into the frame.

Argon and its higher priced relative Krypton are odorless, colorless gasses that are inert, nontoxic and nonreactive and occur naturally in the atmosphere. They are used to infill the space between the two layers of glass for a double pane window, which are the most common thermal pane window. Krypton is more commonly used in triple glazed windows, as the glass space is often thinner. Filling the space between the glass with one of these gasses minimizes the

convection currents within the space, reducing the heat transfer between the outside and interior of your home. The most important thing is keeping the gas in. This is where design, type of materials and the overall assembly of the window is, in fact, the most important factor in any window.

Low-E or in long term, Low-emissivity coatings, reduce the energy transfer through the glass thermal pane unit. This helps achieve a higher level of energy performance for the window and is one of the most common additions to the assembly of a window. A Low-E film helps reject the solar heat entering the home without darkening the glass, significantly improving comfort in the home.

By far one of the most important parts of the assembly of a window is the low conductance spacer and this is often ignored when buying windows. The spacer separates the glass in an insulated unit and it serves a number of functions. The spacer must accommodate the stress caused by thermal expansion and pressure differentials from summer to winter. It provides a base for the gas tight seal, simply keeping the gas inside the double glazed insulated frame. The spacer acts as a moisture barrier and an insulating barrier that prevents the passage of moisture into the window and prevents fogging. The term “broken seal” is what happens when this spacer fails and allows water vapor into the glass cavity. These spacers can be a blend of numerous sealants and often a metal frame, usually aluminum. Higher end windows often use a warm edge spacer made of fiberglass, as this reduces the heat transfer near the edge of the insulated glass.

Modern windows with a good assembly, Low-E and argon gas will make your home more comfortable. The warmer glass surface will help reduce condensation. However, if you have altered the level of air exchange in the home with the addition of new windows, you may see this condensation when the temperatures start to drop. This is an air exchange issue, not the fault of the windows. One side benefit is the reduction of harmful ultraviolet rays that lead to fading.

If you step up to some of the high performance windows, triple glazed, Krypton gas and superior frame assembly, we know that this can have an effect on the sizing of your heating and air conditioning system. If you are considering new windows and a new furnace, maybe worthwhile doing the windows and have a heat loss calculation done at the same time to see what size of furnace you may need once the windows are installed.

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