What makes a window energy efficient?

Windows are an important consideration in the passive solar management of a home, potentially providing free heating, free cooling, and free lighting. Window manufacturers and installers strive to offer energy efficient window solutions that will save you dollars on your energy costs. Here's how they do it.



The Window Type

Window manufacturers have become very good at levelling the window type playing field to make all window types equal. And although many believe that certain window types offer better energy efficiency than others, it really depends on the brand you are looking at keep in mind, by their nature (non-operational) picture windows are certain to be the top performer every time.



The Frame & Sash

Windows are manufactured from a variety of different materials and thicknesses that will influence insulating properties, longevity and price.

Premium materials such as wood and various cladding options will improve thermal resistance and



Window glass is available in various tints and special coatings that can contribute to a window's energy efficiency by absorbing or reflecting the solar heat.

Low Emissivity Glass (Low-E/LoE) has a thin reflective layer of silver applied to its surface reducing the amount of heat that can flow

Professional installers are trained (by the manufacturer) to optimize each window to the full potential for energy efficiency.

They will ensure that the window is installed, insulated and caulked correctly using the proper tools and materials.

To ensure you are getting the best, look for companies that offer lifetime warranties on labour and materials.

contribute to a window's overall energy efficiency (particularly its U-factor). However, costs will often outweigh the possible energy-saving over the life of the window.

There are advantages and disadvantages to all types of frame materials, but typically vinyl, wood, fibreglass, and some composite frame materials provide greater thermal resistance than metal.

through. It reflects heat back to the source - the sun in the summer and back into the home in the winter. Low-E glass is available in several configurations to produce the desired balance between solar gain, light transmittance and UV blocking.

Tinted windows do not officially score points as an energy-efficient solution, as there is no passive solar heating gain in the winter.



The Glazing

Window glazing refers to the glass-framed within a window (IGU's - insulated glass units).

Dual (2 pane windows are the most common glazing configuration but triple and quadruple glazed windows are available from some manufacturers.

The more layers of glass, the higher the thermal insulation



The Gas

Inert odourless, colourless, non-toxic gases such as Argon, Krypton and Xenon are used to fill the spaces between glass multi-paned windows. These gases displace the air between the glazed windows making them less conductive than air and more effective in reducing heat transfer from one pane to another.

Argon is the more widely used gas, that is much less expensive than krypton.

Krypton is typically used for applications where the total glazing unit thickness must be minimized.

Xenon is very expensive compared to



The Spacer

Spacers separate glass panes from each other providing durability, gas retention and increased thermal performance (reduction of temperature transfer from one window pane to another).

There are many different spacer technologies available with all manufacturers claiming theirs is the best. However, it should be noted that windows are rated by the sum of all parts rather than individual components. There is no unbiased spacer testing being offered by reputable sources - When comparing



The Hardware

Hardware (handles, hinges, locks, cranks) do not directly affect the energy-efficiency of a window, in fact because most hardware components are made of metal and some require openings in the frame in order to function they actually have the potential to decrease the insulation value of a window.

Some more recent development that appear to have made a positive affect on energy efficiency include multi-locking mechanisms that provide an improved airtight fitting when closed.

Weatherstripping is another important component in operational windows which with a nice tight fit help to lock

