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ENERGY EFFICIENT WINDOWS

Choosing the the Right Windows for Your Home

“The problem in choosing the right window is being able to understand the factors that influence how well a window insulates, and whether or not they are necessary for your particular application.”

We have been looking at double pane windows and are very confused by some of the terms used for rating their efficiency. The various sales people we have been talking to mentioned “U-factor”, solar heat gain coefficient, Low-e coatings, tinted glass, and some type of gas between the panels. Are all of these necessary for the windows to insulate? Some of these things are extra, and add to the cost of the windows.

Buying double pane windows can be a frustrating experience if you do not understand some of the basic terminology used to describe the insulating qualities of the windows. Insulated glass units are basically two, or three glass panels that are sandwiched together with a metal or plastic spacer in between. These windows come in wood, aluminum, plastic, or vinyl frames, and a variety of options that can increase the window’s insulating abilities.

The problem in choosing the right window is being able to understand the factors that influence how well a window insulates, and whether or not they are necessary for your particular application. To assist the consumer in determining the insulating qualities of a window are, the National Fenestration Rating Council (NFRC) has developed a labeling system that uses the following factors to determine how well a window (frame and glass) insulates; the *U-factor*, the *solar heat gain coefficient*, and the *visible light transmittance* of the window.

The U-factor of a window measures the rate of non-solar heat transferred from one side of the window assembly to the other. Heat transfer refers to the heat that is lost through the inside of the house in the winter, and the amount of non-solar heat that enters during the summer. A single pane of glass has a U-factor of 1.9. As the U-factor falls toward 0, the performance of the window increases. If you live in a cold climate, you would want a low U-factor (less than .5) and in a hot climate, you could go with a higher factor (about .75).

The solar heat gain coefficient, SHGC, measures the amount of solar heat that gets through the window assembly. A window with a single pane of glass has a SHGC of about .75, which means that 75% of the solar heat that hits the window, passes through it. A regular double pane window has a SHGC of about .6. The lower the number, the better the window is at reducing heat gain. A low SHGC can make a big difference in the cooling costs of a house during the summer. In hot climates, a SHGC of .4 or less is best.

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Visible light transmittance (VLT) is a measure of how much light comes through the window assembly. The higher the VLT number, the more light the window allows through. However, you have to be careful when considering this number because it takes into account the entire window frame and glass.

A single pane, aluminum window has a VLT of about .7, while a vinyl window may have a VLT of .6. The real difference in these numbers is that the frame of the vinyl window is larger and the glass area is smaller, thus reducing the amount of light that can enter.

Probably the most important option to increase a window's insulating ability is the *Low-e* coating that is applied to window glass. Low-e stands for "low emissivity", and refers to a microscopically thin, transparent coating that is placed between the panes of an insulated window. This coating has more effect on a window's insulating ability than any other.

A low-e coating can actually reflect heat, and prevent it from passing through a window. During the heat of the day, the coating reflects back to the outside any heat that strikes the window, keeping the glass panel relatively cool. On cold days, it reflects the inside heat back into the house, keeping the inside of the glass warm.

If you are concerned about reducing the amount of light that can pass through a window, there are special tints that can be applied to the glass. These tints only reduce the amount of light that can come through, they do not reflect heat or enhance the U-factor.

The final option you will want to consider is whether or not you want a gas fill between the glass panels. Many manufacturers are putting argon or krypton gas between the panels while others use air. While the gas filled windows perform about 10% better overall, their best advantage is that in colder climates, they reduce condensation.

Since all of these options can affect the overall cost of the window, it is important to consider which ones will meet your particular needs. Whatever options you choose, the small price you will pay for them will be returned not only in energy savings, but also in the increased comfort of your home.

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