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ENERGY FOCUS

Windows a Big Part of Passive Solar Design, Energy Savings

By Adam Wasch, Energy Outreach Consultant at CCHRC

This is the third of a series of columns exploring how solar energy can be used at home to reduce your energy costs.

A central feature of passive solar design, windows, powerfully affect how your home feels and uses energy. For existing homes, maximizing efficiency generally means installing modern replacement windows that use multiple methods for retaining heat.

Low-emissivity (Low-E) windows permit solar heat to enter a house, but block indoor radiant heat from exiting. Low-E coatings cost about 10 percent to 15 percent more than standard windows, but can reduce radiant heat loss by as much as 50 percent. In Fairbanks, most of us are much more concerned with retaining heat in the winter than cooling our homes in the summer, so this Low-E coating is placed on inside of the pane.

Loss of heat through the windows can also be minimized by the use of multiple panes and space between the panes filled with argon or krypton gas. Both the space and the gas slow the heat transfer from the house.

Certain window styles retain a home's heat better than others. For example, typical "slider" windows close less tightly than hinged windows and leak a lot of air. Metal-framed windows conduct a lot of heat out of a house, whereas wood, vinyl, and fiberglass perform better. You don't have to take a contractor's word for a window's efficiency or feel helpless in the home improvement isle. Look for a label issued by the National Fenestration Rating Council (NFRC). Try using the word fenestration at your next book club meeting.

NFRC labels windows according to the window's overall thermal performance (U-factor), heat transmission from sunlight (Solar Heat Gain Coefficient), air leakage (AL), and condensation resistance (CR). Lower numbers are better for the U-factor and air leakage ratings, while higher numbers are better for the coefficient and condensation measures. A solar heat gain coefficient of greater than 0.6 and a U-factor of 0.25 or less is desirable. A window's U-factor is the single most important rating.

The Energy Star label is also useful for assessing a window's efficiency, but even Energy Star's northern climate zone designation does not necessarily mean the window will perform well here. Currently, few

national made windows are tested and labeled for use in the extreme cold that Fairbanks experiences. However, there are several manufacturers in Alaska that are building windows that perform very well in our cold climate. CCHRC's new product testing lab is pursuing ways to identify the windows that perform best here, but in the meantime it is important to consider the energy efficiency of a window in addition to its initial cost. A higher quality window will save you energy and reduce your heating costs. Efficient windows may also qualify for rebates and tax benefits.

The most efficient window will do little good if it is installed improperly. Windows should prevent air leakage through and around them by sealing tightly within their frames and to the building structure. Preserving the integrity of your home's vapor barrier, insulation, and exterior finish is critical when installing windows.

For more information on windows, visit NFRC's website at http://www.nfrc.org and the Efficient Windows Collaborative at http://www.efficientwindows.org/.

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