



COLD CLIMATE HOUSING RESEARCH CENTER

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## **ENERGY FOCUS**

### **Money Savings and Efficient Windows**

**By Mike Musick**

A few days ago I received a phone call from a remodeling contractor who was very concerned that quite a number of Fairbanks residents were buying cheap slider type windows from one of the newer building supply stores. He suggested that we issue a consumer warning on this issue.

I shared his concern regarding sliding windows having lived in an old home with single pane double-hung windows with exterior storm windows. The windows were covered with ice until we learned to apply a shrink wrap clear plastic window kit. This solved the icing problem but still allowed a lot of heat to pass around the perimeter of the windows. This summer we replaced those windows with triple pane units with 2 low E coatings and argon gas in the two chambers. We did a fair amount of research prior to making this investment.

The first thing that I did was contact Richard Seifert at the Cooperative Extension Service and asked him for a copy of a 22 page publication that he had written about Windows as part of a Building in Alaska series. (HCM-04458) I quote directly from page 3:

Sliding windows, whether horizontal or vertical, tend to have the highest air leakage rate because positive closure and compression is more difficult. Turn/Tilt, casement, awning, and hopper windows tend to be more airtight, since more pressure can be placed on the weather-stripped joint. Any warping of the opening sash will also affect the air tightness of an operable window. Compressible weather-strip made of...EPDM compounds, are desirable for cold climates.

Charlie Deer, former owner of the Alaska Window Company, is cited by Seifert as a contributor to this publication. I asked Charlie about his take on sliders and he said that an inexpensive sliding PVC window sash can bow so much in very cold weather (think Fairbanks winter)...“that you can throw a cat through the crack!” He went on to say that “Fiberglass windows are now available in Fairbanks that don’t suffer from bowing as the (unreinforced) PVC windows do when subjected to differential temperatures. Eliminating bowing of the sash greatly enhance air tightness.”

The problem is the weather-stripping has to be loose enough to allow the window to slide. If warm, moist air leaks out through a crack the window will freeze shut. Keep a hammer ready for egress in the winter. Or buy an opening window with good, compressible weather-stripping and good quality hardware that locks the window closed in multiple locations. Also be aware that fixed windows are less expensive, have better resistance to heat flow or higher R-value and

are air tight. You only need operable windows for egress or to promote air flow in or out of the house.

I also talked to Dr. John Davies, Research Director at the Cold Climate Housing Research Center. John confirmed my understanding that consumers should buy the best possible window that they can afford. To support this observation Dr. Davies contacted eight different local suppliers and asked for costs and specifications of a variety of windows that are sold in Fairbanks. He came to the following conclusion: "The higher the R-value of a window the better the payback and the higher the fuel cost the quicker the payback." He also learned that cost is not the only indicator of quality. Some low performing windows cost more than better windows. Davies calculated the payback on an R-3 (pretty good) window versus an R-4 (good) window. At \$3.50 gallon oil an R-4 window saves enough energy to pay back the difference in cost of an R-3 window in 5 years. As the cost of oil goes up the payback time decreases. At \$4.00 oil the payback time is 4.4 years. At \$5.00 per gallon pay back is 3.5 years. When oil reaches \$7.00 the payback time is 2.5 years. The best locally manufactured windows have an R-value of 6.67. These (very good) windows will payback even more quickly.

You have probably heard about the contractor who installed new high R-value windows for a woman but never got paid. After a year of sending invoices and waiting patiently for payment the contractor finally contacted the woman who protested that he had told her that her new windows would pay for themselves in a year. That is why most window manufactures and installers like to collect 50% down and the rest upon completion.

To sum up, it is better to pay a little more for windows in the beginning than spending more on heating your home in the long term.

**Mike Musick is a longtime home builder in Fairbanks and an Outreach Consultant at the Cold Climate Housing Research Center.**