

# EASY\$ TIP SHEETS

## Energy Advice Saving Yukoners Money

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## ENERGY STAR® Qualified Windows

In many homes across the Yukon, windows account for 10 to 15 per cent of the total surface area exposed to outside temperatures, yet, even this small surface area can account for as much as 30 per cent of the heat loss in these homes. Windows are an ideal target for energy conservation measures and increased comfort for occupants.

Old windows can be the cause of significant energy loss in the home. Single-pane windows and double-pane windows with metal frames are poor insulators and perform poorly in keeping heat in or out of your home. Air leakage is likely to occur along the edges of operable windows, or between their frame and the wall, where seals and caulking are in poor condition. The best way to ensure you purchase the most energy-efficient window is to choose a window supplier that carries windows with the ENERGY STAR® label.

Windows with the ENERGY STAR® label have been certified by an independent agency for their quality and energy performance. They often incorporate low-e coatings, argon gas fill and better air tightness, all of which contribute to reduced heat loss.

### Goal and Summary

This Easy\$ sheet covers a wide range of options to reduce heat loss from windows in your home. You will learn how to plan your window purchases and learn about the characteristics of high efficiency windows.

For a complete list of ENERGY STAR® qualified windows available in Canada go to [www.energystar.gc.ca/energystar/index.html](http://www.energystar.gc.ca/energystar/index.html) and look under “Information for general consumers”.

## Planning your window purchase

While the cost of new windows is seldom recovered from the energy savings, the incremental cost for higher performance windows – like ENERGY STAR® qualified windows – is often recovered in a relatively short period of time. Entry doors, patio doors and skylights can also qualify for ENERGY STAR® labeling and further contribute to reduced energy costs.

If your budget doesn't allow you to change all your windows at once, plan to complete your window purchase in distinct phases. Some suggestions are:

- 1) Consider replacing north facing windows with ENERGY STAR® qualified windows first. These windows generally have the largest impact on your winter comfort and energy savings performance.
- 2) If overheating is a problem in summer, then consider installing awnings over south facing windows or planting deciduous trees to shade them.
- 3) If your existing windows are larger than you need, consider replacing them with smaller ENERGY STAR® qualified windows.
- 4) Install replacement ENERGY STAR® qualified windows where your family spends most of its time. Once you begin to enjoy the comfort, aesthetics and savings, you will see the benefit of purchasing the remaining windows.

Replacing old windows with ENERGY STAR® qualified windows can decrease the size of the heating system you need to effectively heat your home. For this reason, many renovation professionals recommend changing your windows before installing a new furnace or boiler. In many cases, you may be able to install a smaller, less expensive heating system.

ENERGY STAR® qualified windows (and doors) are divided into four classes based on climate zones (A, B, C and D). Zone A is designed for the mildest climate and Zone D for the coldest climate. Chose an ENERGY STAR® qualified window that is best for the climate zone you live in. Approximately the southern half of the Yukon is in Zone C and the northern half is in Zone D, as shown on the map below.



Map Credit: Natural Resources Canada – Office of Energy Efficiency <http://www.oee.nrcan.gc.ca/energystar/>

## Materials used in ENERGY STAR® qualified windows

### Double and triple-pane windows

Double and triple-pane windows reduce heat loss because they contain sealed air spaces, usually about half an inch wide, which work as additional insulators. The air spaces restrict air movement, slowing down heat loss through windows.

### Low-e (low-emissivity) windows

Low-e windows have a clear coating on the glass to keep heat outside during the summer and heat inside during the winter. This is a virtually invisible coating of a semi-conductor or metal oxide film that is applied directly to the glass or on plastic film between the two panes. Low-e windows also block a portion of the ultraviolet light that contributes to the fading of carpets, drapes and furniture.

Low-e coatings come in two varieties – hard coat or soft coat. Soft coats or sputter coats, primarily silver oxide, are the most effective at reflecting heat and generally insulate better than hard coats. By reducing heat build-up in the summer, soft coats can reduce the use of air conditioning. On the other hand, hard coats allow more solar heat to pass through the window, which can reduce space heating requirements on sunny winter days. Consulting window suppliers is the best way to determine which coating is best for your application.

Windows manufactured with low-e films typically cost about 10 per cent more than regular (clear) glass windows, but they will reduce energy loss by as much as 30 to 50 per cent. The energy savings alone should pay for that higher cost in less than 10 years.

### **Gas fills**

Gas fills are inert gases, such as argon or krypton, which manufacturers use to fill the space between the glass panes to reduce heat loss. Heat does not conduct through inert gases as easily as it does through air, making inert gases better insulators. Argon gas is commonly used because it is less expensive than krypton gas.

### **Low-conductivity spacers**

Low-conductivity spacers further improve the energy performance of low-e or gas-filled windows by as much as 20 per cent. A spacer is the material that separates the two panes when making an insulated glass unit. Low-conductivity spacers keep the inside glass warmer at the perimeter, reducing the likelihood of window condensation in cold weather.

### **Window frames**

Window frame construction and materials can have a big effect on energy performance, required maintenance and life span of windows. Common materials include:

#### *Aluminum frames*

which are strong, have a long life span and require little maintenance, however they require low-conductivity spacers to minimize heat loss and condensation at the perimeter.

#### *Combination frames*

which combine the features of aluminum-wood or vinyl-wood to offer superior exterior protection and an attractive interior design.

#### *Fibreglass frames*

which are not widely offered but are rated high in energy performance and strength, with little maintenance. Some designs are filled with foam insulation to further decrease heat loss.

#### *Vinyl frames*

which can offer improved thermal performance and freedom from maintenance.

#### *Wood frames*

which are strong, have insulating value and a long life span, but require maintenance for continued protection from the weather.

It is most important to ensure that your ENERGY STAR® labeled windows are installed by a qualified window professional. Even a high performance window will perform poorly if it is installed improperly.

When comparing windows of the same size, a fixed picture window will generally perform better than a window that opens. This is primarily due to the air leaks that occur along the opening edges of the window. However, bedrooms are required to have an opening window to allow house occupants to escape in an emergency such as a fire. A building inspector will be able to tell you the minimum opening size requirements for bedroom windows.

This Easy\$ tip sheet is provided by the Energy Solutions Centre.

If you have additional questions or comments, please contact the Energy Solutions Centre by:

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