



# ENERGY STAR<sup>®</sup> qualified windows and doors

## overview

*Understand the benefits of ENERGY STAR<sup>®</sup> qualified windows and doors, so you can enjoy a more comfortable home and save energy.*

## Windows

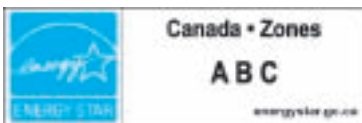
In many homes across British Columbia, windows frequently account for 10 per cent to 15 per cent of the total surface area exposed to outside temperatures, yet, even this small surface area can account for as much as 30 per cent of the heat loss in your home. Windows are an ideal target for energy conservation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

Old windows can be areas of significant energy loss in the home. Single-pane windows and old 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 identify the most energy-efficient window is the ENERGY STAR label.

## How to identify ENERGY STAR qualified windows

Look for an ENERGY STAR label like the one below. This is your guarantee of superior energy performance.



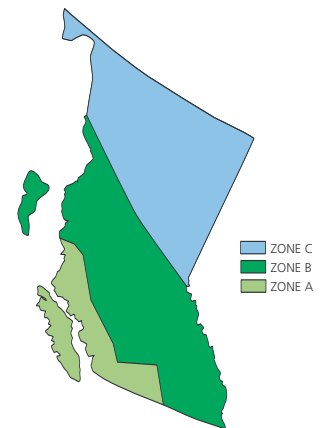
Windows that have an ENERGY STAR label have been certified by an independent agency for

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.

Check [www.energystar.gc.ca/windows](http://www.energystar.gc.ca/windows) for a complete list of ENERGY STAR qualified windows available in Canada.

**Climate Zones** divide ENERGY STAR qualified windows (and doors) into three zones (A, B, C) in British Columbia – refer to the map.

Zone A is the mildest climate and Zone C is the coldest climate. Choose an ENERGY STAR qualified window that is best for the climate zone you live in.



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

## Materials used in ENERGY STAR qualified windows

**Double and triple-pane windows** do not reduce heat loss because of additional glass. They are designed with a sealed air space, usually half an inch wide, which works as an additional insulator. This space restricts air movement, slowing down heat loss through windows.

**Low-e (low-emissivity) 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 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 coat 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 double glazed windows, but they will reduce energy loss by as much as 30 per cent to 50 per cent. The energy savings alone should pay for that higher cost in less than 10 years.

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

**Low-conductivity spacers** improve the energy performance of low-e, 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 frame** construction and materials can have a big effect on energy performance, required maintenance and life span of windows. Common materials include:

- *Aluminum frames* – 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* – combine the features of aluminum-wood or vinyl-wood to offer superior exterior protection and an attractive interior design.
- *Fibreglass frames* – 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* – can offer improved thermal performance and freedom from maintenance.
- *Wood frames* – have a good strength, insulating value and life span, but require maintenance for continued protection from the weather.

*When comparing two windows of the same size, a fixed picture window will always perform better than a window that opens. This is primarily due to the air leaks that occur along the opening edges of the window.*

## Other components to look for in ENERGY STAR qualified windows

Windows and doors are ENERGY STAR qualified by their U-value or their Energy Rating (ER).

**U-values** indicate how well a window keeps heat in your home. A low U-value means less heat is transferred through the window. It is defined as a reciprocal of the R-value ( $U = 1 / R$ ), where the R-value measures a windows resistance to heat flow.

Zone	Maximum U-Value (W/m <sup>2</sup> K – Metric)
A	2.00
B	1.80
C	1.60
D	1.40

**Energy Ratings (ER)** provide a measure of a window's overall energy performance. ER measures heat gain and loss through the window frame and the glass. A higher ER number means the window generally will lose less heat.

*MOST IMPORTANT ensure your ENERGY STAR labelled windows are installed by a qualified window professional. Even a high performance window will perform poorly if installed improperly.*

## Planning your window purchase

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) Install south and west facing windows first. These windows generally have the largest impact on your comfort and energy savings performance.
- 2) Install new windows where your family spends most of their time. Once you begin to enjoy the comfort, aesthetics and savings, you will see the benefit of purchasing the remaining windows.

*Installing new windows can decrease the size of the heating system you need to effectively heat your home.*

*Many renovation professionals recommend changing your windows before installing a new furnace or boiler. In many cases, you will be able to install a smaller heating system, which lowers the heating system cost and prevents purchasing an oversized furnace.*

## How to save energy from your existing windows

Sometimes replacing all your old windows is not an option. There are alternate solutions that can help reduce energy loss.

**Window coverings** – like blinds and curtains – will help reduce heat loss through windows particularly at night. However, they must not inhibit the air movement on the surface of the window. If air movement is restricted, condensation may form, causing the window to 'sweat'.

**Install storm windows** on the inside or outside of the existing window. Greater insulation is achieved from the still air space created between the two windows, reducing window heat loss. This will not, however, eliminate all the drafts from the frame or seal the window as tightly as a new unit would. Storm windows can be permanent, seasonal or temporary.

## ENERGY STAR qualified doors

In addition to their obvious function of providing entry to or from the home, doors function as part of the shell of the home. Replacing a door just for the energy benefit is rarely recommended because the area of the door is small and the cost of replacement is high. But when you've decided to replace an exterior door for any other reason, it pays to consider its thermal features.

**Insulated doors** are the recommended choice to improve comfort and thermal performance. Insulated doors are usually made of foam and wood, covered with metal; however, fiberglass or vinyl doors are becoming more readily



available and can offer superior thermal performance and wood-like finishes. Door frames are usually wood, clad with metal or vinyl and integrated with the door into an installation unit.

**Patio doors** perform much like an insulated glass window unit. As the glass area is large, always use as many thermal performance features as possible, such as low-e coating, gas fills and thermal spacers, to increase the insulation value of the unit.

**Storm doors**, when properly designed and installed, will provide an extra degree of thermal efficiency as well as added protection from wind and rain. They can also provide summer ventilation with screen inserts.

ENERGY STAR qualified doors have minimum energy ratings that specify their insulating and air leakage performance.

## Draftproofing existing windows and doors

Draftproofing can be a cost-effective measure you can take. Sealing holes and gaps will improve comfort, can reduce moisture problems, save money and provide a quieter indoor environment.

There are a wide variety of materials available for draftproofing doors. The two main types of draftproofing materials are weatherstripping and caulking.

Homeowners need to be aware that by reducing air infiltration significantly, you must maintain indoor air quality and meet ventilation requirements. A mechanical ventilation system may be needed to ensure adequate ventilation and combustion air for heating appliances. If you have any concerns, consult a professional HVAC contractor. They can perform tests and professionally assess your ventilation requirements.

## Weatherstripping

Weatherstripping is used to block air leakage around doors and movable windows. It is designed to work under compression and comes in a variety of shapes: flat, tube or V shaped.

When choosing a weatherstripping product, consider the size of the gap, durability, ease of installation and appearance of the product itself. Look for products that are flexible and spring-back to their original shape quickly. Avoid products that make it difficult to operate the window or door.



## Caulking

Caulking or sealant is another common product to reduce air leakage around doors and non-opening windows. These products are not permanent and will have to be maintained and replaced over time as they begin to deteriorate.

Caulking is available for interior and exterior applications and should be used only for the application they have been developed for. Using an exterior sealant for an interior application can lead to dangerous gases mixing with the air in the living space and could, in extreme cases, lead to explosions.

You can find more information on different types of weatherstripping and caulking materials, please visit [www.bchydro.com](http://www.bchydro.com).

## Installation

This is a general guide only. Please ensure that all installations meet your requirements, manufacturer's instructions and all applicable codes, standards and regulations. BC Hydro is not responsible for installations.

*For more Power Smart information call:*

Lower Mainland . . . . . 604 431-9463

Elsewhere in B.C. . . . . 1 877 431-9463

**[www.bchydro.com](http://www.bchydro.com)**

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