

Ottawa Renovates

COMPLIMENTARY



2017 GUIDE

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Select A High-Performance Window For Your Home

Traditionally, a window was simply an opening in a wall, roof or door that allowed light, sound and air to enter and people to see out.

Today, windows are complex architectural features of our homes that provide:

- Protection against wind, rain and snow;
- Passive light diffusion in rooms to reduce the need for electric light;
- Insulation in the exterior envelope (winter & summer);
- A visual connection to the exterior;
- Ventilation when required;
- Solar heat gain in the winter to reduce heating costs;
- Decrease in summer heat gain to lower air conditioning costs;
- Egress in some cases;
- Protection against bugs and intruders.

The intent of this article is to help readers better understand windows and to ask their contractor the right questions when replacing windows.

BENEFITS OF A HIGH-PERFORMANCE WINDOW

- Energy and cost savings – reduces cost of heating and cooling;
- Reduce greenhouse gas emissions through better energy efficiency;
- Lower cost of heating, ventilation and air conditioning (HVAC) equipment costs by reducing HVAC sizes;
- Improve thermal comfort – interior glass surface maintains a higher temperature;
- Reduce condensation – warmer interior glass surface reduces frost and condensation;
- Exterior noise reduction;
- Help maintain a constant temperature in a room.

COMPONENTS OF HIGH-PERFORMANCE WINDOWS

A good quality window must be designed, insulated and assembled to allow for light, views and in many cases ventilation while sealing out the weather. It must shed heavy rain without leaking and block powerful winds. If it is an operable window, it must open and close easily and resist intruders when locked. The exterior frame should be maintenance-free.

To handle all these tasks effectively, the typical window has many parts and a surprisingly complex construction:

- Low conduction frame and sash;
- Multiple glazing (double or triple);
- Low emissivity coatings;
- Inert gas between glass panes (argon, krypton);
- Insulated edge spacer between glass panes;
- Compression seal between frame and sash;
- Weather stripping;
- High-quality hardware

COST OF HIGH-PERFORMANCE WINDOWS

Window cost is generally based on the type and quality of frames, exterior finishes, hardware, glass, weather stripping, sealants, shapes, style, bug screen and the like.

The demand for coloured windows, both exterior and interior, is a current design trend. Custom colours and multiple frame styles have also affected costs.

If your window manufacturer is in the US, the exchange rate of the Canadian/US dollar and other related costs will affect prices in Canada.

Most manufacturers do not make all the components of a window. They source the majority of components and then assemble the window and have it tested, similar to a car manufacturer. Manufacturers that are fully integrated for glass, wood, aluminum or PVC will be able to reduce costs and have better control over quality.

The wide variation in component costs will determine the quality and performance of the final product. It is important to understand that glass represents approximately 40% of the window costs and that the quality of the sealed units is the most critical aspect of the design when it comes to window performance and longevity.

IMPORTANT ENERGY EFFICIENT TERMINOLOGY OF A WINDOW

U-FACTOR: Measures how well a window can keep heat from escaping from the inside of a home. U-Factor is measured as a range of 0.20 to 1.20. BTU/hr x ft² x °F. The lower the U-Factor, the better the product insulates. “Center of glass U-Factor” refers to the glass portion of the window and not the product as a whole; again, look for lower numbers when checking the Center of glass U-Factor.

SHGC: The Solar Heat Gain Coefficient is the ability of the glass to absorb energy from the sun. High SHGC helps reduce energy consumption in the winter but could cause overheating in summer. Low SHGC helps to reduce cooling costs. It is obviously important to determine which window should have low or high SHGC. The range for SHGC is 0.25-0.80. In general, look for lower numbers.

C.R.: Condensation resistance measures how well a window resists the formation of condensation on the inside surface. Range 0-100. The higher the CR, the less build-up of condensation the window allows.

VISIBLE TRANSMISSION: Measures how well the glazing is designed to effectively light your home with daylight. This may be reduced by low emission coatings. Range 0-1. Look for a higher numbers.

AIR LEAKAGE: Measures how much air will enter a room through a locked window. Ranges 0.1-0.3. Look for lower numbers.

ER: Energy Rating is a value given to a window based on the unit performance levels under winter conditions and takes into account the balance between heat lost (U value), air leakage and solar heat gain (SHGC). Ranges from 0-0.50. The higher the number, the more energy efficient the window is.

CLIMATIC ZONES

Canada is divided into three climatic zones (1, 2 & 3), which can help you find the energy-efficient product that is best suited to where you live. Zone 1 is the warmest and zone 3 is the coldest. Ottawa is in zone 2. If you choose a window for zone 3 then you can expect better energy performance.

If all this seems too technical for you, just ask your contractor to supply and install ENERGY STAR-certified windows for your climate zone. For better energy performance, choose a window for a colder climate zone.

ENERGY STAR enables consumers to easily identify windows with superior energy performances.

More information is available at these websites.

www.nrca.gc.ca

www.energystar.gov

Roy Nandram is President of RND Construction Ltd.

WINDOW LABELS, CERTIFICATIONS AND PERFORMANCE RATINGS

		Canada - Zone 1 2 3 energystar.nrcan-rncan.qc.ca ER/RE = 38	
DO NOT REMOVE UNTIL FINAL INSPECTION / NE PAS RETIRER AVANT L'INSPECTION FINALE			
		Battant-Fixe DAL-M-46-00005-00001 Battant/Battant Fixe 4600 B/BF-8070-arg-CI-arg-8070-Grills/Carr.:None/Au DAL-M-46-00005-00001	
ÉVALUATION DES PROPRIÉTÉS ÉNERGÉTIQUES ENERGY PERFORMANCE RATING			
Valeur-U U-Factor 0.19 <small>(US/I-P)</small>		Coefficient de gain de chaleur solaire Solar Heat Gain Coefficient 0.38	
1.08 <small>(w/m²*k)</small>			
ÉVALUATION SUPPLÉMENTAIRE DES PROPRIÉTÉS ADDITIONAL PERFORMANCE RATINGS			
Transmission Visible Visible Transmittance 0.47		Infiltration d'air Air Leakage 0 0.35 <small>(US/I-P)</small> <small>(m³/h/m)</small>	
Résistance à la Condensation Condensation Resistance ---			
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. specific product size. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>			
<small>Selon le fabricant, ces cotes sont conformes aux procédures applicables du NFRC servant à établir le rendement global du produit. Les cotes du NFRC sont établies selon les conditions environnementales et des dimensions de produits spécifiques. NFRC ne recommande aucun produit et ne garantit aucun produit dans leurs applications et recommandations d'installations. Consultez la littérature du fabricant pour de l'information sur le rendement de tout autre produit. www.nfrc.org</small>			
ID			902-01515-10-1

Canadian-made windows generally have a CSA-A440.2-14 label, while American-made windows use NFRC label (National Fenestrations Rating Council). NFRC window labeling has been harmonized for use in Canada. These labels may show the rating of energy performance, air leakage, water tightness, wind resistance, forced entry resistance and screen strength/ease of operation.

The CSA-A440.2 standards allow for several levels of performance:

- Air tightness (A) – A1-A3
- Water tightness (B) – B1-B7
- Wind load resistance (C) - C1-C5
- Forced entry resistance (F) – min F10
- Screen strength/ease of operation (S/E)
- Energy rating (ER) 0-0.50

Sealed glass units should be manufactured by a IGMAC-certified glass manufacturer under the CGSB 12.8 Standard (Insulating Glass Manufacturers Association of Canada)

Labels allow you to take a deeper look into various energy factors so you can determine which product best fits your needs. In each of the above, the higher the number the better the performance.

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