



BC Energy Efficiency Act - Regulatory Proposal for Window and Door Products

A number of regulations for window and door products are currently included in the Energy Efficiency Standards Regulation that can be viewed at:

http://www.qp.gov.bc.ca/statreg/reg/E/389_93.htm

A detailed backgrounder on current regulations can be viewed at:

http://www.empr.gov.bc.ca/EAED/EnergyEfficiency/Documents/IC08_04%20EE%20Standards%20Windows%20Doors%20Skylights%20260908.pdf

The standards under the *Energy Efficiency Act* are different than those recently updated under the ENERGY STAR program. ENERGY STAR is a voluntary program to promote higher levels of energy efficiency than regulated levels. The Provincial Sales Tax exemption for ENERGY STAR windows is scheduled to end on March 31, 2009.

This document provides an overview of proposed regulation changes for window and door products in British Columbia. These proposed changes will be submitted to the Minister of Energy, Mines and Petroleum Resources in late December 2008. Proposed changes are highlighted with **bold text** throughout this document.

Consultations

These proposed changes are a result of extensive industry consultations, including:

- An invitation for written comments on the regulatory implementation plan, sent on September 24, 2008 to about 200 industry players, predominantly in British Columbia. There were relatively few responses due to the availability of telephone consultations (see below).
- A Ministry chaired telephone consultation on October 8, 2008 with over 50 participants. The following issues were raised during the consultation:
 - temporary labels for windows;
 - indication of BC specific compliance on permanent labels;
 - possibility of a consistent label for all products in BC;
 - labelling of doors;
 - testing generic product lines;
 - exemption of pre-hangers;
 - requirement for glass lites in wooden doors;
 - clad wood doors;
 - status of regulation for aluminum windows;
 - aluminum windows and the renovation market for apartments;
 - breather tubes for windows at high elevations; and,
 - existing inventories on non-compliant products.



- Communications with individual industry players.
- A telephone consultation on October 24, 2008, specific to the issues for aluminum window manufacturers. The consultation highlighted the fact that aluminum “slider” windows would not comply with the regulated energy efficiency standards, but fixed, awning and casement type products could comply. In addition, a technical expert hired by the Aluminum Extruders Council was present on the call, Thomas Culp.
- Consultation of strata-building consumers, pertaining to their preferences for window replacement options in low-rise, apartment/condo buildings.
- A tour of two door pre-hanger plants in the greater-Victoria area on October 27, 2008, highlighting the complexities with product labelling and certification.
- A telephone consultation on October 29, highlighting preliminary Ministry conclusions from all consultations. These conclusions are highlighted in this paper.
- A final telephone consultation with Window and Door Manufacturers’ Association of BC, BC Hydro, Natural Resources Canada and the Building and Safety Policy Branch on this specific paper.
- A written comment period commenced November 27, 2008 through to December 24, 2008.

Conclusions

The following conclusions were drawn in response to consultations.

Window Labelling

- Permanent labels will be required (as per current regulation). **The label will need to indicate that the product has been tested under A440.2 or NFRC 100 (e.g., see example below from QAI) and that the product complies with the BC *Energy Efficiency Act*, but does not need to indicate the product model number.**
- **Permanent label information may appear on a label applied to the framing of the product or on the glass (by adhesive transparent label or etched into the glass surface).**
- This demonstrates that the thermal performance of the product has been verified by a Standards Council of Canada or National Fenestration Rating Council accredited organization as being compliant with the regulation, using the CSA A440.2 or NFRC 100 test procedures.
- Temporary labels are also required with the U-value listed in metric units. **No additional information is required.**
- **The U-value can be integrated into labels that provide other information,** such as compliance with CSA A440 physical testing and performance requirements.



- Two examples of acceptable labels are attached at the end of this document: the NFRC or ENERGY STAR label. These will not be specified by the regulation to enable flexibility for label evolution.
- **One label is required for each type of component integrated into an assembly, or for the overall average U-value.** For example, a 4 lite assembly with three fixed and one operable component would require two labels – one for the fixed lites and one for the operable.
- ENERGY STAR qualified products may not use the ENERGY STAR label in place of the specified permanent label described above.

Figure 1 – sample permanent label



Aluminium Windows

- As noted, the Ministry conducted extensive consultations regarding aluminium-framed windows, as many of such products do not currently comply with the energy efficiency standard of 2.0 W/m²/K.
- Non compliant products include slider windows, storefront windows, curtain wall and window wall.
- One manufacturer has received achieved Energy Star qualification for double glazed fixed and triple-glazed aluminium casement products.
- Manufacturers are developing compliant “window wall” products.
- An alternative “Energy Rating” compliance path was considered for aluminium products (ER = 17 or higher). The ER path includes solar heat gain benefits. The Ministry received contradictory information on the merits of the ER path for promoting energy efficiency in coastal BC from the Aluminum Extruders Council, BC Hydro, WDMA-BC and leading BC based architects and engineers.
- Due to the lack of consensus on the merit of the ER path, the Ministry will maintain the U-value approach for setting energy efficiency standards.
- However, the Ministry will propose **an extended effective date and less stringent interim standard for aluminium and metal framed products** to accommodate retooling after extension consultations.
- The **proposed U-value maximum is 2.57 W/m²/K effective June 1, 2009 and 2.0 W/m²/K effective January 1, 2011.**



- The interim standard is equivalent to the ASHRAE 90.1 (2007) standard for metal framed curtain wall, window wall and storefront windows, with or without thermal break.

High Rise Fenestration Products

- The regulation does not currently apply to residential buildings with more than 5 stories or commercial buildings that have a floor space of more than 600 m² or a height of 4 stories or more.
- The rationale for this exemption is that glazing for these buildings is covered by the BC Building Code through the ASHRAE 90.1 (2004) standard.
- The BC Building Code applies to new construction and major renovations only. As such, replacement windows for high-rise buildings do not currently have any energy efficiency requirements.
- As a result of this gap, the Ministry is proposing **the following new standards for products that are not captured by the ASHRAE 90.1 standard**, effectively targeting replacement products, as new construction is captured by the BC Building Code standards.
- **The standard will apply to entire window assembly, not a centre of glass rating.**
- The proposed standards are aligned with the updated ASHRAE 90.1 (2007) standards, more stringent than the building code provisions that are based on the 2004 edition of ASHRAE 90.1.

	Maximum U-value (W/m²/K)	Effective Date
Metal framed curtain wall, window wall and storefront, with or without thermal break	2.57	January 1, 2011
Other metal framed windows	3.14	January 1, 2011
Windows with framing materials other than metal, with or without metal reinforcing or cladding	2.0	January 1, 2011

- This will ensure a level playing field between low-rise and high-rise buildings and between products for new construction and replacement products.
- The Ministry has completed independent cost-effectiveness studies for similar standards, available upon request.
- The Ministry will ensure that the standard is harmonized with future efficiency levels in the BC Building Code. A regulatory amendment may be proposed in the future to ensure alignment.



Exemptions from Window Regulations

- **Products or components that are not within the scope of A440.2 and NFRC 100**
- **Windows installed in heritage designated buildings by the provincial government or local governments**
- **Glazing replacements in an existing sash and frame**
- **Windows installed in high rise buildings that meet ASHRAE 90.1 (2004 or 2007) standard**
- Decorative windows
- Several stakeholders noted that “garden windows” would not comply with the 2.0 W/m²/K standard. Given the extended timeline for aluminium framed windows, an exemption will not be provided for such windows.

Door Slabs

- **A separate regulation will be established for door panels** (rather than listing it as part of item 41 in Schedule 1).
- The door panels must be insulated with products rated to a thermal resistance of RSI 0.875 (m² * K)/W using the test procedure ASTM C518.
- **A permanent label from a third party organization is required, indicating that the product complies with the BC Energy Efficiency Act.** This label can be painted over, provided it has a transparent layer that can be removed after painting.
- **An extended effective date** will ensure that third party verification programs are in place to demonstrate compliance.
- Temporary labels will not be required.
- Metal clad, wooden slabs are exempt from the regulation under the existing provisions exempting solid wood door panels.

Door Lites

- Door lites in all types of doors (including solid wood slabs and frames), must:
 - be multiple glazed with at least one low-E coating between glazing,
 - include a 90% argon gas fill level with a compatible edge sealant system, and,
 - **have thermally improved spacer bars made with any metal or non-metal materials (or a combination of the two) excluding non-thermally broken aluminium box spacer bars.**
- **Door lites will not require IGMA (Insulating Glass Manufacturers Alliance) certification.**
- Permanent labels indicating compliance with the BC *Energy Efficiency Act* will be required.



- **An extended effective date** will ensure that third party verification programs are in place to demonstrate compliance
- Door lites installed in pre-hung doors such as ENERGY STAR doors that are certified as less than or equal to 2.0 watts/m²/K are exempt from the prescriptive options.
- **Lites with breather tubes will not require argon fill.**
- A temporary label is not required.
- Door pre-hangers purchasing slabs and lites that are labelled compliant are essentially exempt from the regulation, but compliance checking may be conducted at pre-hanger operations, as some of the products are imported.

Testing by SCC and NFRC accredited agencies, Engineers and Architects

- The following are designated for the purpose of testing manufactured fenestration products described in item 37 of Schedule 1 (windows):
 - all Standards Council of Canada agencies
 - all agencies accredited by the National Fenestration Rating Council as independent certification and inspection agencies in relation to those products;
 - professional engineers; and,
 - architects authorized to practice in British Columbia.
- A proposed amendment would **limit the purview of engineers and architects to products tested under Section 7(15) of the regulation**, the flexibility provision for windows for structural support or heritage preservation purposes.
- Engineers and architects shall attest that U-values were obtained using the most recent editions of the CSA A440.2 or NFRC100 standards.

Effective Dates

- Windows and skylights (fibreglass and vinyl): January 1, 2009.
- **Door slabs and lites: June 1, 2009.**
- **Aluminium and metal framed windows: June 1, 2009.**
- **Windows for high-rise buildings not captured by ASHRAE 90.1: January 1, 2011.**
- Wood framed windows: January 1, 2011.



Temporary Labels for Windows and Doors

Qualified for highlighted area.
Répond aux exigences pour les régions indiquées.

Canada



ENERGY STAR

1 800 387-2000
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■ = Qualified/Admissible

U-value / Valeur-U		Solar Heat Gain Coefficient Coefficient de gain de chaleur solaire	
1.48 (W/m ² ·K)	0.26 (Btu/h·ft ² ·°F) (Btu/h·pi ² ·°F)	0.27	
Visual Transmittance Transmission visible		Energy Rating Rendement énergétique	
0.51		22	
Air Tightness Étanchéité à l'air		CSA A440.0 A3 B5 C3 F2	
0.55 m³/h·m			

COMPANY NAME
PRODUCT DESCRIPTION OR MODEL NUMBER

NOM DE LA COMPAGNIE ET LOGO
DESCRIPTION DU PRODUIT OU CODE DE MODÈLE

CERTIFICATION AGENCY LOGO
AND ADDITIONAL INFORMATION

LOGO DE AGENCE D'HOMOLOGATION
ET INFORMATION ADDITIONNELLE

World's Best Window Co.
Millennium 2000+
Vinyl-Clad Wood Frame
Double Glazing • Argon Fill • Low E
Product Type: **Vertical Slider**


ENERGY PERFORMANCE RATINGS

U-Factor 0.35 (U.S./I-P)	2.0 (Metric/SI)	Solar Heat Gain Coefficient 0.32
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ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance 0.51	Air Leakage 0.2 (U.S./I-P) 1.0 (Metric/SI)
Condensation Resistance 51	—

Manufacturer stipulates that these ratings conform to applicable procedures for determining whole product performance. ratings are determined for a fixed set of environmental conditions and a specific product size. does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information.




ENERGY PERFORMANCE RATINGS

PRODUCT DESCRIPTION	U-Factor/Solar Heat Gain Coefficient (SHGC)			
	1/4 Lite < 0.265 m ² (4.10 sq ft)	1/2 Lite < 0.581 m ² (6.27 sq ft)	3/4 Lite < 0.710 m ² (7.61 sq ft)	Full Lite > 0.710 m ² (7.61 sq ft)
2" - /air/0.75	0.96 (0.17) / 0.03	1.53 (0.27) / 0.19	N / A	N / A
2" - /air/0.75 grids	0.96 (0.17) / 0.03	1.53 (0.27) / 0.17	N / A	N / A
3" - /air/0.31 deco	0.96 (0.17) / 0.03	1.36 (0.24) / 0.16	1.59 (0.28) / 0.24	1.70 (0.30) / 0.29
2/0.204(2)/air/0.75	0.96 (0.17) / 0.03	1.36 (0.24) / 0.19	1.64 (0.29) / 0.28	1.76 (0.31) / 0.33
2/0.204(2)/air/0.75 grids	0.96 (0.17) / 0.03	1.36 (0.24) / 0.15	1.64 (0.29) / 0.25	1.76 (0.31) / 0.30
Flush or embedded	0.79 (0.14) / 0.01			


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 specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information.
www.nfrc.org

Qualified for highlighted area.
Répond aux exigences pour les régions indiquées.

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■ = Qualified/Admissible



Summary of Proposed Regulations

Proposed changes to Energy Efficiency Standards Regulation¹ are indicated in **underlined bold**.

Section 4: Persons and agencies designated to test and verify

(1) Every testing agency accredited by the Standards Council of Canada as a certification organization and having a verification program recognized by the minister is designated to test and verify any energy device the agency is accredited to certify.

(1.1) The following are designated for the purpose of testing manufactured fenestration products described in **items 37, 41, 42 and 43** of Schedule 1:

- (a) all agencies accredited by the National Fenestration Rating Council as independent certification and inspection agencies in relation to those products;
- (b) professional engineers **for the purpose of compliance with Section 7(15) only**;
- (c) architects authorized to practice in British Columbia **for the purpose of compliance with Section 7(15) only**.

Section 5: Labels

(3) For the purposes of section 2 (1) (b) of the Act, every manufactured fenestration product described in item 37 of Schedule 1 of this regulation, other than those specifically excluded in Column 1 of item 37 of that schedule, must have affixed to the indoor side of the glazing a temporary label indicating **the verified heat transfer rate (U-value/U-factor) of the window assembly expressed in metric units. One label is required for each type of component integrated into an assembly, or for the overall average U-value of the assembly. The U-value can be integrated into labels that provide other information**

Section 7 Prescribed Efficiency Standards

(15) For **items 37 and 43** of Schedule 1, for manufactured fenestration products to which the requirements of Columns 2 and 3 apply but that

- (a) are designed for a specific building for structural support purposes or heritage preservation purposes, and
- (b) fall outside the scope of existing certification programs,

¹ http://www.qp.gov.bc.ca/statreg/reg/E/389_93.htm



the actual size of the product may be used for the simulations and the average overall U-value of all fenestration in the building may be used for evaluation.

Schedule 1

	Energy Device	Test Procedure	Energy Performance Standard	Effective Date
37	<p>Manufactured fenestration products, including sliding glass doors, skylights and windows, that separate heated space from non-heated space, except</p> <p>(a) windows in residential buildings of 5 storeys or more,</p> <p>(b) windows in non-residential buildings with more than 600m² floor space,</p> <p>(c) decorative windows that have stained glass panels, iron inserts or blinds, contained in a sealed insulating glass unit,</p> <p><u>(d) windows installed in heritage designated buildings by the provincial government or local governments, and</u></p> <p><u>(e) glazing replacements in an existing sash and frame</u></p>	<p>Subject to section 7 (15), CSA A440.2-04</p> <p>Energy Performance of Windows and Other Fenestration Systems or NFRC 100-2004</p> <p>Procedure for Determining Fenestration Product U-Factors</p>	<p><u>Except for skylights and solid metal framed windows and sliding glass doors:</u> maximum U-value = 2.0 W/(m² • K)</p> <p>For skylights: maximum U-value = 3.10 W/(m² • K)</p> <hr/> <p><u>For solid metal windows and sliding glass doors:</u> maximum U-value = 2.57 W/(m² • K)</p> <hr/> <p><u>For solid metal windows and sliding glass doors:</u> maximum U-value = 2.0 W/(m² • K)</p>	<p>Jan. 1, 2009 for manufactured fenestration products other than solid wood framed windows, sliding glass doors or skylights.</p> <p>Jan. 1, 2011 for solid wood framed windows, sliding glass doors and skylights.</p> <hr/> <p><u>June 1, 2009</u></p> <hr/> <p><u>January 1, 2011</u></p>



41	<p><u>Glass lites for installation in manufactured door slabs</u>, sidelites and transoms, that separate heated space from non-heated space, <u>except:</u></p> <p><u>(a) lites installed in pre-hung door assemblies that have a maximum U-value = 2.0 W/(m² • K) tested with NFRC 100-2004 Procedure for Determining Fenestration Product U-Factors, and</u></p> <p><u>(b) decorative lites that have stained glass panels, iron inserts or blinds, contained in a sealed insulating glass unit.</u></p>		<p>The glass lites must be multiple glazed with at least one low-E coating between glazing, a 90% argon gas fill level with a compatible edge sealant system and have <u>thermally improved spacer bars made with any metal or non-metal materials (or a combination of the two) excluding non-thermally broken aluminium box spacer bars</u></p> <p><u>Glass lites with breather or capillary tubes are not required to have a 90% argon gas fill level</u></p>	<u>June 1, 2009</u>
42	<p><u>Door slabs, excluding solid wood door slabs</u></p>	<p><u>ASTM C518 - 04 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus</u></p>	<p>The door panels must be insulated with products rated to a thermal resistance of RSI 0.875 m²K/W or higher</p>	<u>June 1, 2009</u>



43 <u>Manufactured fenestration products, including sliding glass doors, skylights and windows, that separate heated space from non-heated space in residential buildings of 5 storeys or more or non-residential buildings with more than 600m² floor space, except:</u> <u>(a) products installed in buildings that are compliant with ASHRAE 90.1 (2004 or 2007) Energy Standard for Buildings Except Low-Rise Residential Buildings, and</u> <u>(b) glazing replacements in an existing sash and frame</u>	<u>Metal framed curtain wall, window wall and storefront, with or without thermal break</u>	<u>2.57 W/(m² • K)</u>	<u>January 1, 2011</u>
	<u>Other metal framed windows</u>	<u>3.14 W/(m² • K)</u>	<u>January 1, 2011</u>
	<u>Windows with framing materials other than metal, with or without metal reinforcing or cladding</u>	<u>2.0 W/(m² • K)</u>	<u>January 1, 2011</u>