



Natural Resources  
Canada

Ressources naturelles  
Canada

# Fenestration Manufacturers' Guide to Applying for ENERGY STAR<sup>®</sup> in Canada



## Contents

<b>Introduction .....</b>	<b>1</b>
<b>Applying for ENERGY STAR .....</b>	<b>1</b>
<b>Steps towards ENERGY STAR qualification.....</b>	<b>2</b>
<b>Step 1: Choose the product models for ENERGY STAR qualification .....</b>	<b>2</b>
<b>Step 2: Certify the product models .....</b>	<b>2</b>
<b>Step 3: Become an ENERGY STAR Participant in Canada.....</b>	<b>4</b>
<b>What is the cost? .....</b>	<b>5</b>
<b>Benefits of being a Participant .....</b>	<b>5</b>
<b>Requirements comparison table .....</b>	<b>6</b>
<b>Fenestration qualifying levels.....</b>	<b>7</b>
<b>Sample ENERGY STAR fenestration qualification labels.....</b>	<b>8</b>
<b>Contact information.....</b>	<b>9</b>

## Introduction

This guide provides an overview for fenestration manufacturers on how to apply to use the ENERGY STAR® symbol in Canada, including product testing and certification requirements. The guide is intended for informational purposes only.

Companies that want to qualify products for ENERGY STAR must contact Natural Resources Canada (NRCan) or consult a recognized certification organization for complete details. Manufacturers that want to use the ENERGY STAR symbol in the United States (U.S.) *must also apply* to the U.S. ENERGY STAR program.

ENERGY STAR is *the* international symbol for energy efficiency. Every day, consumers in Canada, the U.S. and many other countries use the ENERGY STAR symbol to identify products that perform at premium levels of energy efficiency without sacrificing appearance, features or quality. According to a recent national survey, consumer awareness of the ENERGY STAR symbol has increased dramatically in Canada. Almost 90 percent of respondents who had seen the ENERGY STAR symbol were aware that it represents energy efficiency, and 70 percent said they prefer to buy ENERGY STAR qualified products when possible.

The qualifying criteria and levels for ENERGY STAR were primarily developed for fenestration products installed in low-rise residential and small commercial buildings as defined by Part 9 of the *National Building Code of Canada*. Most fenestration products installed in high-rise residential units or for institutional and large commercial buildings are also eligible for qualification and labelling but may not be able to meet the levels for ENERGY STAR. Products that are not eligible for qualification and labelling are revolving doors, overhead doors, storm windows, storm doors, films, blinds and curtains as well as component parts such as doorlites, glazing units, extrusions and spacer bar systems.

To qualify for the ENERGY STAR symbol, fenestration products must be independently tested to ensure they meet strict technical specifications. Production processes, quality control procedures and thermal performance test results must also be certified by an approved certification organization. Once this has been done, the manufacturer is eligible to enrol as an ENERGY STAR Participant with NRCan, which administers and promotes ENERGY STAR in Canada. Participants and their registered product models are listed on the NRCan Web site. Participants also receive valuable marketing materials and are able to take part in joint marketing and networking activities with government, utilities and others organizations.

ENERGY STAR is a registered trademark of the U.S. Environmental Protection Agency and is administered and promoted in Canada by Natural Resources Canada.

## Applying for ENERGY STAR

All product models must be certified for their thermal performance to be eligible for ENERGY STAR.

To qualify for ENERGY STAR in Canada, all skylights must have a U-value of  $3.10 \text{ W/m}^2\cdot\text{K}$  ( $0.54 \text{ Btu/h}\cdot\text{sq. ft.}\cdot^\circ\text{F}$ ) or lower. All other fenestration products must have a U-value of  $2.00 \text{ W/m}^2\cdot\text{K}$  ( $0.35 \text{ Btu/h}\cdot\text{sq. ft.}\cdot^\circ\text{F}$ ) or lower. Windows and sliding glass doors must also have an airtightness rating of  $1.65 \text{ (m}^3/\text{h)/m}$  or  $1.5 \text{ L/s/m}^2$  or lower.

For each of the four qualifying climate zones in Canada, there is a U-value compliance path and an Energy Rating (ER) compliance path. For more information, see the section entitled "Fenestration qualifying levels" on page 7.

To apply to use the ENERGY STAR symbol in Canada, a manufacturer must

- review the ENERGY STAR symbol guidelines, fenestration labelling and promotional guidelines, and the technical specifications
- register at least one qualifying product model with NRCan by using the Product Entry Form
- submit a signed Administrative Arrangement to NRCan
- submit a completed Commitment Form to NRCan

For more information on the ENERGY STAR initiative for fenestration products, see the Web site at [www.energystar.gc.ca/windows](http://www.energystar.gc.ca/windows). Click How To Participate at the bottom of the Web page to find the symbol, label and promotional guidelines, and to send a request for an application kit.

**Note:** To market fenestration product models as ENERGY STAR qualified in the U.S., manufacturers must apply to the U.S. ENERGY STAR program. See contact information at the end of this guide.

## Steps towards ENERGY STAR qualification

A manufacturer may need to take all or some of the following steps to become an ENERGY STAR Participant in Canada.

### ***Step 1: Choose the product models for ENERGY STAR qualification***

Manufacturers should carefully consider what models they want to promote as ENERGY STAR qualified in Canada. It is normally advantageous for a manufacturer to offer a “suite” of product models to give consumers a choice in purchasing an energy-efficient product. If design changes are planned to the models under consideration, or if a completely new product line is being developed, take the time to finalize the details before submitting the product for testing and certification. Product testing and certification requires a significant investment of time and money. You may want to choose and contact a certification agency (see Step 2) if you want to test or simulate a product before you begin the certification process.

### ***Step 2: Certify the product models***

Manufacturers must have their product models certified for their thermal performance by an accredited certification agency *before* the products can be registered for ENERGY STAR.

The certification process involves an initial plant audit and then on-going plant audits to verify that the product models are being produced the same way as the tested model was, and that adequate quality control procedures are in place. All certification and testing requirements are determined by the certification agency. Manufacturers may have to provide up-to-date drawings, a list of components and any test or simulation reports for each product line that is submitted for certification.

Certification of a product's *structural* performance for ENERGY STAR qualification is currently optional. However, to protect the integrity of their certification mark, many agencies require certification of all structural ratings (including the insulated glazing unit) before they will certify the thermal performance.

NRCAN does not certify products. However, data from the following accredited certification organizations are accepted for ENERGY STAR in Canada:

- CSA International (CSA)
- Intertek Testing Services
- National Fenestration Rating Council (NFRC)
- Quality Auditing Institute (QAI)

**Note:** Manufacturers planning to market product models in the U.S. as ENERGY STAR qualified must certify these products through NFRC.

### Initial plant audit

After you choose a certification agency, the agency will normally conduct an in-plant audit. This audit reviews the manufacturing process, verifies that appropriate quality control measures are in place, and makes recommendations to correct any gaps in quality control. The auditor may also confirm that you are still producing the same product as those in test reports you submit and may witness the fabrication of test samples. Audits are normally conducted in each factory location where the products being submitted for certification are made.

### Testing phase

This phase of the certification process normally takes the most time and may involve physical testing, thermal simulation, or both, depending on what testing and simulation has already been done on the product.

Assessing a product's structural performance requires the physical testing of product samples by an accredited test laboratory. Your certification agency can provide a list of accredited laboratories. Thermal simulations are done by computer by using the design specifications provided to an independent thermal simulator. Your certification agency can provide a list of approved simulation facilities. If your products have already been tested for structural performance under CSA A440 (a requirement for new construction under the *National Building Code of Canada*), you may be able to use the test results for the purposes of ENERGY STAR qualification.

For ENERGY STAR qualification in Canada, windows and sliding glass doors must also be tested by a laboratory for their airtightness. This testing is not currently a requirement for swinging doors and skylights. This testing may be completed as part of the certification process, or the manufacturer may already have test data that can be submitted directly to NRCAN on the Product Entry Form.

After receiving and reviewing the test and simulation results, the manufacturer gives permission for the results to be forwarded to the certification organization.

Canadian certification agencies normally require testing to one or more of the following standard specifications:

- CSA A440.0-00 *Windows*
- CGSB 82.1-M89 *Sliding Doors*
- CGSB 82.5-M88 *Insulated Steel Door*
- CSA A440.2-04 *Energy Performance of Windows and Other Fenestration Systems\**
- CSA A453.0-95 *Energy Performance Evaluation of Swinging Doors*

\*NRCAN does not accept data tested to the 1998 version or earlier versions of this standard.

Testing to the harmonized structural standard specification AAMA/WDMA/CSA 101/I.S.2/A440-05 may also be accepted for purposes of ENERGY STAR qualification. This harmonized standard covers all fenestration products.

For the U.S. NFRC certification program, testing and simulation to the following standards is required:

- NFRC 100\* *Procedure For Determining Fenestration Product U-factors*
- NFRC 200\* *Procedure For Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*

\*NRCan does not accept data tested to the 1997 version or earlier versions of these standards.

NFRC certification also requires validation testing to ensure that the thermal simulations are accurate. A test laboratory must validate the simulated U-value rating using a “guarded hot box” test.

For the purposes of ENERGY STAR qualification, an ER is normally calculated for all product models if a valid airtightness value is submitted. This process allows NFRC-certified products to use either the U-value or ER compliance path. The only exception is skylights, because the ER formula does not currently apply to sloped glazing.

### **Final phase**

The certification agency compiles and reviews the test and simulation results received from the test laboratory and thermal simulator. After the agency’s fees are paid and all other requirements have been satisfied, certification will be granted.

Some agencies may complete an ENERGY STAR Product Entry Form and submit it on behalf of their clients, either before or after final certification has been granted. Early submission of the form is acceptable if NRCan is informed of any changes to the client’s certification application.

### **Ongoing certification requirements**

Some certification agencies require mandatory labelling of each model of a certified product using the agency’s official certification mark. This may be a temporary or permanent label. Manufacturers should be aware of these labelling requirements, which are separate from the requirements for using the ENERGY STAR symbol, before signing a contract with the certification agency.

In addition, the certification agency will require periodic in-plant audits after certification is granted to monitor production processes and quality control measures. Any significant changes to the product or to production processes will require re-certification.

## **Step 3: Become an ENERGY STAR Participant in Canada**

To complete the process, the manufacturer must forward a signed Administrative Arrangement, a completed Commitment Form and one or more Product Entry Forms to NRCan. In some cases, the certification agency will submit the Product Entry Forms on behalf of its client.

After these documents have been reviewed and accepted, you are notified of your acceptance into the ENERGY STAR program in Canada. Your company name is posted on the NRCan Web site, along with the submitted data on all registered product models. The registration process takes 2 to 4 weeks.

**Note:** If the manufacturer sells its products under a brand name other than the name of the manufacturer (sometimes referred to as a private label brand), these models must also be registered with NRCan under the private label brand name in order for them to be ENERGY STAR qualified.

## **What is the cost?**

There is no cost to participate in the ENERGY STAR program in Canada. However, the various certification agencies, testing laboratories and simulation facilities will charge the manufacturer for their services.

The initial cost to fully certify one product line, including all testing, simulations and audits, ranges from \$20,000 to \$25,000. Annual certification costs are typically about \$3,500 per product line per year. Certification costs can be significantly lower if existing test and simulation results are accepted by the certification agency.

## **Benefits of being a Participant**

Participants benefit from being a part of a government-backed initiative that promotes energy efficiency to Canadians in a simple and straightforward manner. The symbol is used on many energy-efficient products and new homes in Canada, the U.S. and internationally. This helps to give ENERGY STAR a high level of market exposure, and the symbol is gaining brand recognition with consumers every year. A number of rebate and incentive programs across Canada also use ENERGY STAR as a basis for their own energy efficiency programs.

Participants are expected to respect the technical specifications for fenestration products, use the ENERGY STAR symbol and name according to the guidelines set out by NRCan, train their staff about ENERGY STAR and include ENERGY STAR in their promotions and on their Web sites. Participants are also expected to complete an annual survey that allows NRCan to collect statistics on the success of the initiative and to receive comments on possible changes or improvements.

## Requirements comparison table

Item	ENERGY STAR in Canada	Certification organizations			
		CSA	Intertek	NFRC	QAI
<b>Scope</b>	Windows, sliding glass doors, swinging doors, skylights.	Windows, sliding glass doors.	Windows, sliding glass doors, swinging doors.	Windows, sliding glass doors, swinging doors, skylights.	Windows, sliding glass doors, swinging doors.
<b>Structural performance</b>	Airtightness test only required for windows and sliding glass doors.	Full structural certification required.	Full structural certification optional.	Not applicable.	Full structural certification optional.
<b>Thermal performance</b>	Certification and testing or simulation required.	Certification and testing or simulation optional.	Certification and testing or simulation optional.	Certification required. Validation testing of simulations required.	Certification and testing or simulation optional.
<b>Insulating glass unit</b>	No certification or testing required.	IGMA <sup>1</sup> certification required.	IGMA certification required.	Valid test report only. No certification required.	IGMA or QAI certification required.
<b>Acceptance of test results from extruders and system designers for certification purposes</b>	No specific requirement. Model data accepted if certified.	Testing and audits required for each manufacturing location.	Testing and audits required for each manufacturing location.	Test reports may be accepted. Audits required for each location.	Testing and audits required for each manufacturing location.
<b>Retesting</b>	Retesting may be required if there are changes to a standard or product model.	Retesting may be required if there are changes to a standard or product model.	Retesting may be required if there are changes to a standard or product model.	Retesting is mandatory every four years. Retesting may also be required if there are changes to a standard or a product model.	Retesting may be required if there are changes to a standard or product model.
<b>Temporary label</b>	Qualification label recommended.	Certification label required.	Certification label required.	Certification label required.	Certification label required.
<b>Permanent label</b>	Not required.	Required.	Required.	Required.	Required.
<b>Product model registration</b>	Required by ENERGY STAR in Canada.	Manufacturer must complete and submit NRCAN Product Entry Form.	Agency will submit NRCAN Product Entry Form on behalf of manufacturer upon request.	Manufacturer must submit NRCAN Product Entry Form.	Agency will submit NRCAN Product Entry Form on behalf of manufacturer upon request.

<sup>1</sup> Insulating Glass Manufacturers Alliance



## Fenestration qualifying levels

The technical specifications for ENERGY STAR qualification of fenestration products vary from one part of Canada to another based on climate conditions: the colder the climate, the more stringent the requirements. The tables below outline the ENERGY STAR qualifying levels for each of four climate zones, with Zone A being the warmest and Zone D the coldest. (See the climate zone map next page.)

### Windows and doors

Zone	Heating degree-day range	U-VALUE PATH		OR	ENERGY RATING PATH	
		Maximum W/m <sup>2</sup> •K (Btu/h•sq. ft.°F)	SHGC*		Minimum ER (dimensionless) (Maximum U-value 2.00 W/m <sup>2</sup> •K or 0.35 Btu/h•sq. ft.°F)	
					Windows with sashes and doors	Windows without sashes
A	≤ 3500	2.00 (0.35)	Any	or	17	27
B	> 3500 to ≤ 5500	1.80 (0.32)	Any	or	21	31
C	> 5500 to ≤ 8000	1.60 (0.28)	Any	or	25	35
D	> 8000	1.40 (0.25)	Any	or	29	39

\* Solar heat gain coefficient

### Skylights

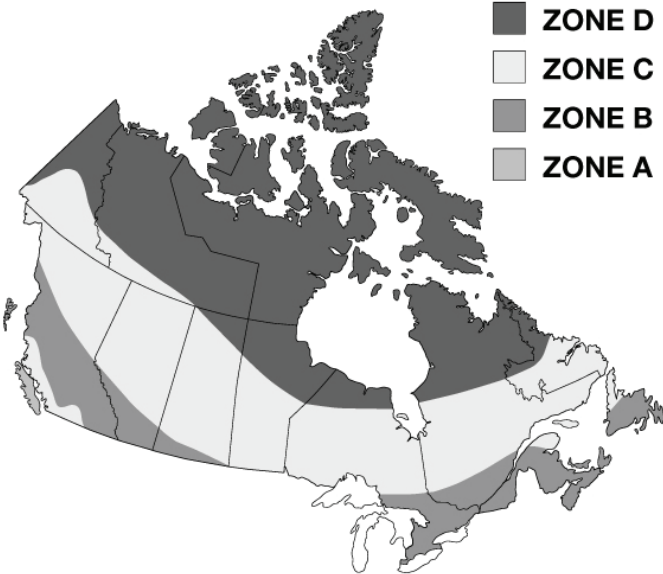
Zone	Heating degree-day range	Maximum U-value* W/m <sup>2</sup> •K (Btu/h•sq. ft.°F)	SHGC**
A	≤ 3500	3.10 (0.54)	Any
B	> 3500 to ≤ 5500	2.80 (0.50)	Any
C	> 5500 to ≤ 8000	2.60 (0.46)	Any
D	> 8000	2.38 (0.42)	Any

\* Skylights must be tested or simulated for their thermal performance in a sloped position of at least 20 degrees.

\*\* Solar heat gain coefficient

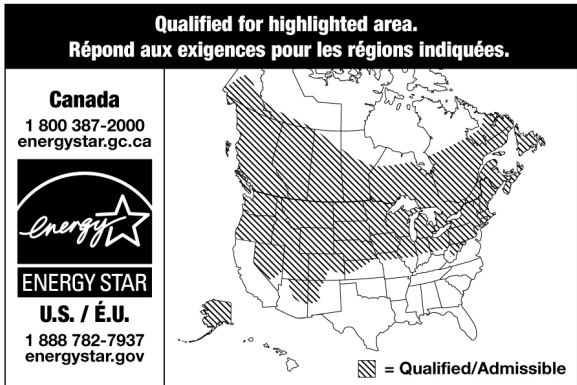
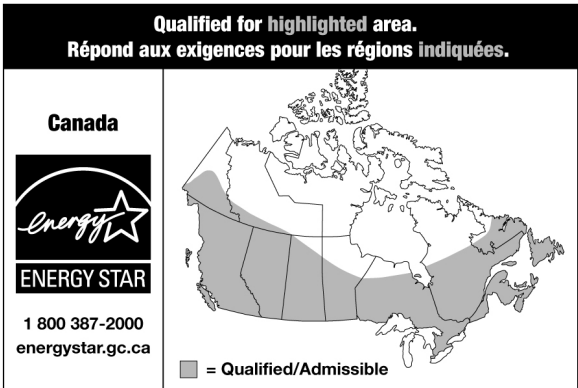
Windows and sliding glass doors must have an air leakage rate of less than or equal to 1.65 (m<sup>3</sup>/h)/m. Skylights and swinging doors are not required to meet an air leakage requirement at this time.

**ENERGY STAR climate zone map for Canada**



**Sample ENERGY STAR fenestration qualification labels**

The following samples show the various types of labels and some of the designs available for ENERGY STAR qualified fenestration products. In these samples, the product qualifies for ENERGY STAR in Zones A, B and C. The Canada/U.S. sample label also includes the U.S. ENERGY STAR Northern Zone.



## Contact information

### ENERGY STAR in Canada:

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### Certification organizations

#### *CSA International*

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**Consultants**

The following consultants are available to help fenestration manufacturers prepare their application for the Canadian ENERGY STAR initiative.

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