



**ENERGY STAR® Technical Specification for
Windows, Doors, and Skylights
Sold in Canada
Version 6.0
Draft Final**

This technical specification determines how a Fenestration Product (windows, doors, and skylights) sold in Canada are certified for the ENERGY STAR program. This specification is issued by Environment and Climate Change Canada (ECCC). ECCC has been authorized by the U.S. Environmental Protection Agency (EPA) to promote and administer the ENERGY STAR name and symbol in Canada. A Fenestration Product shall meet this specification to be promoted as ENERGY STAR certified in Canada by its manufacturer or authorized agent. Manufacturers must also sign a Fenestration Administrative Arrangement with ECCC.

1) Definitions

For the purposes of this specification, a Fenestration Product is a factory-assembled product as per the product types and sub-categories listed in this specification. A Fenestration Product is designed for installation in a low-rise building that is 3 stories or less in height and less than 600 square metres in area. When installed, a Fenestration Product separates conditioned space from unconditioned space (external wall or roof).

Fenestration Product Types

- A. Window: An assembled unit consisting of a frame/sash holding one or more pieces of glazing functioning to admit light and/or air into an enclosure and designed for a vertical installation in an external wall. Includes Transoms.
- B. Door: A sliding or swinging entry system designed for and installed in a vertical wall separating conditioned and unconditioned space. Includes Sidelites.
- C. Skylight: A Window designed for sloped or horizontal installation in a roof, the primary purpose of which is to provide daylighting and/or ventilation. Tubular Daylighting Devices (TDDs) are considered skylights.

Fenestration Product Subcategories

- D. Sliding Door: A door that contains one or more manually operating glass panels that slide horizontally within a common frame.
- E. Swinging or Folding Door: A door system that swings on a vertical axis, having a hinge attachment of any type between a leaf and jamb, mullion, or

edge of another leaf or having a single, fixed vertical axis about which the leaf rotates between open and closed positions.

- F. Sidelite: A Fenestration Product consisting of a glazed frame or a sash within a frame that is used as a companion product installed on one or both sides of a door.
- G. Transom: A Fenestration Product consisting of a glazed frame or a sash within a frame that is used as a companion product installed above a door or a window.
- H. Tubular Daylighting Device (TDD) or tubular skylight: A non-operable device primarily designed to transmit daylight from a roof surface to an interior ceiling surface via a tubular conduit. The device consists of an exterior glazed weathering surface, a light refractive tube with a reflective inside surface and an interior sealing device, such as a translucent ceiling panel. Tubular Daylighting Devices (TDDs) are considered skylights.
- I. Dynamic Glazing Product: Any Fenestration Product that has the fully reversible ability to change its performance properties, including U-factor, Solar Heat Gain Coefficient (SHGC), or Visual Transmittance (VT). This includes, but is not limited to, shading systems between the glazing layers and chromogenic glazing.
 - i. Chromogenic glazing: A broad class of changeable glazings that have means to reversibly vary their optical properties, including active materials (e.g., electrochromic and Suspended Particle Device/SPD) and passive materials (e.g., photochromic, thermochromic, etc.).
 - ii. Internal Shading System: Operable blinds or shades positioned between glass panes in a window, door, or skylight.

Performance Metrics

- J. U-Factor: Heat transmittance is the heat transfer per time per area per degree of temperature difference in $\text{W/m}^2\cdot\text{K}$ ($\text{Btu/h ft}^2\cdot^\circ\text{F}$). The U-factor multiplied by the interior-exterior temperature difference and by the projected fenestration product area yields the total heat transfer through the fenestration product due to conduction, convection, and long-wave infrared radiation. A U-factor in $\text{Btu/h ft}^2\cdot^\circ\text{F}$ multiplied by 5.678263 converts the value to $\text{W/m}^2\cdot\text{K}$. The U-factor in $\text{Btu/h ft}^2\cdot^\circ\text{F}$ shall conform with Table 1 before the conversion to $\text{W/m}^2\cdot\text{K}$.
- K. Solar Heat Gain Coefficient (SHGC): The ratio of the solar heat gain entering the space through the fenestration product to the incident solar radiation.
- L. Air leakage: the flow of air that passes through fenestration product in L/s/m^2 . Air leakage infiltration is the flow of air into the building envelope and

exfiltration is the flow of air out of the building envelope. An air leakage in cfm/ft^2 multiplied by 5.08 converts the value to $\text{L}/\text{s}/\text{m}^2$. The air leakage value in cfm/ft^2 shall conform with Table 1 before the conversion to $\text{L}/\text{s}/\text{m}^2$.

- M. Decimal Precision: If necessary, values will be rounded using the arithmetic method prior to any calculation and to the decimal precision defined in Table 1.

Table 1: Decimal Precision

Value	Decimal Precision
Air leakage (infiltration)	1
Air leakage (exfiltration)	1
U-factor	2
SHGC	2

- N. Insulating Glass Unit (IGU): A preassembled unit, consisting of lites of glass, which are sealed at the edges and separated by dehydrated space(s).
- O. North American Fenestration Standard (NAFS): The common name for the following testing standard: AAMA/WDMA/CSA 101/I.S.2/A440. This document is jointly published by the American Architectural Manufacturers Association (AAMA), Window and Door Manufacturers Association (WDMA), and the Canadian Standards Association (CSA).
- P. Private labeller: A company that markets under its own name window, door, or skylight models manufactured by a different company under its own name.
- Q. Standards Council of Canada (SCC): a Canadian federal Crown corporation that accredits standards writing organizations, test laboratories, certification agencies, quality management and environmental management registration bodies.
- R. National Fenestration Rating Council (NFRC): is an independent non-profit organization that develops energy performance standards for fenestration products and provides independent third-party verification of energy performance and other related ratings for fenestration products.

2) Scope

- A. Included Products: Fenestration Products as specified herein are eligible for ENERGY STAR certification, with the exception of products listed in Section 2.B.
- B. Excluded Products: Fenestration Products that are normally assembled onsite, including but not limited to sash packs or sash kits; products that are intended

for installation in non-residential buildings; and fenestration attachments that are not included in a product’s certified energy performance rating.

3) Criteria for ENERGY STAR Certification

- A. Energy Efficiency Requirements: Window and door models shall meet the requirements in Table 2. Skylights shall meet the requirements in Table 3. Dynamic glazing products shall meet the requirements while in the minimum tinted state for chromogenic glazing products or the “fully open” position for internal shading systems.

Table 2: U-factor Criteria for Windows and Doors

Product	Maximum U-factor W/m ² ·K	Maximum U-factor Btu/h·ft ² ·F
Windows and Doors	1.05	0.18

Table 3: U-factor Criteria for Skylights

Product	Maximum U-factor W/m ² ·K	Maximum U-factor Btu/h·ft ² ·F
Skylights	2.10	0.37

- B. Air Leakage Requirements: Fenestration models must have an air infiltration rate and an air exfiltration rate less than or equal to 1.5 L/s/m².

4) Test and Certification Requirements

- A. All models shall be certified using the following standards, for determining U-factor and SHGC:

CSA A440.2-22/A440.3-22 Fenestration Energy Performance

or

ANSI/NFRC 100 Procedure for Determining Fenestration Product U-factors and ANSI/NFRC 200 Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

**The version/year required for certification is determined by NFRC.*

To be eligible for registration into the ENERGY STAR product list, certification must be obtained within the last 5 years.

- B. All models shall be tested in accordance with the following standard, in order to determine air leakage (infiltration) and air leakage (exfiltration):

AAMA/WDMA/CSA 101/I.S.2/A440-17 North American Fenestration Standard/Specification for windows, doors, and skylights (NAFS)-17 and its Canadian Supplement A440S1-19

or

AAMA/WDMA/CSA 101/I.S.2/A440-22 North American Fenestration

Standard/Specification for windows, doors, and skylights (NAFS)-22 and its Canadian Supplement A440SI-25.

or

AAMA/WDMA/CSA 101/I.S.2/A440-22 North American Fenestration Standard/Specification for windows, doors, and skylights (NAFS)-26 and its Canadian Supplement A440SI-TBD

To be eligible for registration into the ENERGY STAR product list, the test results must be obtained within the last 10 years.

Note: certification to NAFS is not a requirement.

- C. All Insulating Glass Units shall be certified using the following standard:

ASTM E2190-19 Standard Specification for Insulating Glass Unit Performance and Evaluation

or

CAN/CGSB 12.8-17 (R2022) Insulating Glass Units Standard

- D. The model selected for testing or simulation shall be representative of that which is intended to be marketed and labeled as ENERGY STAR.
- E. Certification for energy performance must be done by an organization accredited by the SCC for the scope of the product being certified, or, by NFRC.
- F. Testing to NAFS to determine air leakage (infiltration and exfiltration) must be done by an organization accredited by the SCC, or other signatories to the Asia Pacific Laboratory Accreditation Cooperation (APLAC) and/or the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement for the scope of the product being tested.

5) **Model Registration and Labelling**

- A. Product models must be registered with ECCC using the designated submission form to be labelled and considered ENERGY STAR certified in Canada.
- B. Product models registered with ECCC for ENERGY STAR must be labelled in accordance with the current [Guidelines for the labelling and promotion of ENERGY STAR® certified fenestration products sold in Canada](#) to be considered ENERGY STAR certified in Canada.
- C. Disclaimer: The ENERGY STAR Canada program only qualifies Fenestration Products based on U-Value and Air Tightness. Additional ratings, including those required by NAFS, is not evaluated. The ENERGY STAR program is a voluntary program meant to improve the energy performance of fenestration

products on the Canadian market and is not an alternative to meeting local code compliance requirements.

6) **Installation Instructions**

Products shall have installation instructions readily available online and/or packaged with the product. This information does not need to be included on product labels. Electronic versions of instructions may be provided on the website of a retailer, manufacturer, and/or industry association. Retailers, manufacturers, and industry associations may include in these instructions whatever disclaimers they feel are necessary to limit their liability. ECCC understands that the manufacturer cannot write installation instructions for every situation and that generic instructions covering the most common situations are acceptable to fulfill this requirement.

Manufacturers are responsible for providing information that either differs from CSA A440.4-19 (R2024) Window, Door, and Skylight Installation, or is specific to their product. For any information not provided in the installation instructions, following CSA A440.4 is considered best practice.

The installation instructions shall include:

- i) A list of hardware and tools required for installation, including those provided by the manufacturer and those not provided by the manufacturer.
- ii) Diagrams/pictures and descriptions of the product or a typical product of similar type and parts provided by the manufacturer.
- iii) General guidance on safely removing old products and preparing the frame for installation. Guidance should direct consumers to relevant content on proper management of lead paint and asbestos, such as the guidance issued by Health Canada (<https://www.canada.ca/en/health-canada/services/home-safety/lead-based-paint.html>).

Consideration: Older homes may contain lead-based paint, which may be disturbed when replacing windows or performing renovations. Consult state, provincial or local authorities for safe handling, disposal, or abatement requirements. For more information in Canada, go to Health Canada <https://www.canada.ca/en/health-canada/services/home-safety/lead-based-paint.html>.

- iv) General information on proper disposal or recycling of products being removed.

- v) Detailed flashing instructions including diagrams/pictures or reference to the applicable flashing manufacturer's instructions, as applicable to the product, or reference installation procedures detailed in CSA A440.4.
- vi) Instructions on properly shimming the product to achieve an installation that is flush, level, and plumb. (Inclusion of diagrams/pictures is preferred, but optional.)
- vii) Guidance on sealing and weatherproofing to prevent air and water infiltration at the product-wall interface. (Inclusion of diagrams/pictures is preferred, but optional.)
- viii) Variations of the above based on whether the job is a pocket installation, rough opening installation with exterior sheathing intact, and/or rough opening installation with exterior sheathing removed, as applicable to the product.

Disclaimer: ECCC makes no warranties, expressed or implied, nor assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of the contents of installation instructions, or any portion thereof. Further, ECCC cannot be held liable for defects or deficiencies resulting from the proper or improper application of installation instructions.

7) **Effective Date**

The effective date for Version 6.0 is January 1, 2029 and supersedes all previous versions. Models shall meet the ENERGY STAR specification in effect on the model's date of manufacture. The date of manufacture is specific to each unit and is the date on which a unit is considered to be completely assembled.

8) **Future Criteria Revisions**

ECCC reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through industry discussions. In the event of a specification revision, please note that ENERGY STAR certification is not automatically granted for the life of a product model.