ENERGY STAR® Program Requirements for Residential Windows, Doors, and Skylights

Partner Commitments

Following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacture and labeling of ENERGY STAR qualified products. The ENERGY STAR Partner must adhere to the following partner commitments:

Qualifying Products

1. Comply with current ENERGY STAR Eligibility Criteria, which define performance requirements and test procedures for residential windows, doors, and skylights. A list of eligible products and their corresponding Eligibility Criteria can be found at www.energystar.gov/specifications.
2. **Prior to associating the ENERGY STAR name or mark with any product**, obtain certification from National Fenestration Rating Council (NFRC), a Certification Body recognized by EPA for residential windows, doors, and skylights. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform residential windows, doors, and skylight testing. A list of EPA-recognized laboratories and Certification Bodies can be found at www.energystar.gov/testingandverification.

Using the ENERGY STAR Name and Marks

3. Comply with current ENERGY STAR Identity Guidelines, which define how the ENERGY STAR name and marks may be used. Partner is responsible for adhering to these guidelines and ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance. The ENERGY STAR Identity Guidelines are available at www.energystar.gov/logouse.
4. Use the ENERGY STAR name and marks only in association with qualified products. Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is qualified and offered for sale in the U.S. and/or ENERGY STAR partner countries.
5. Provide clear and consistent labeling of ENERGY STAR qualified residential windows, doors, and skylights.

    5.1. The ENERGY STAR mark must be clearly displayed in product literature (i.e., spec sheets, catalogs, etc.), and on the manufacturer's website where information about ENERGY STAR qualified models is displayed.

    5.2. Partner may also use the Spine Label on product packaging.

    5.3. Partner shall adhere to the following product-specific commitments regarding use of the ENERGY STAR mark on qualified products:

        5.3.1. All qualified windows, doors, and skylights must display the Product Qualification Label in accordance with the Partner Requirements and Resource Guidelines for Manufacturers.

        5.3.2. ALL display units for qualified products must display the Display Unit Label.

        5.3.3. Components may not carry an ENERGY STAR mark or label.

Verifying Ongoing Product Qualification

6. Participate in third-party verification testing through National Fenestration Rating Council (NFRC), a Certification Body recognized by EPA for windows, doors, and skylights, as soon as the program (also

known as blind purchase) is implemented, providing full cooperation and timely responses. EPA/DOE may also, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at the government's request.

Providing Information to EPA

7. Cooperate with market assessment research completed by Drucker Research on behalf of American Architectural Manufacturers Association, and the Window and Door Manufacturers Association.
8. Report to EPA any attempts by recognized laboratories or Certification Bodies (CBs) to influence testing or certification results or to engage in discriminatory practices.
9. Notify EPA of a change in the designated responsible party or contacts within 30 days using the My ENERGY STAR Account tool (MESA) available at www.energystar.gov/mesa.

Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures, and should keep EPA informed on the progress of these efforts:

- Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.
- Consider energy efficiency improvements in company facilities and pursue benchmarking buildings through the ENERGY STAR Buildings program.
- Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes.
- Feature the ENERGY STAR mark(s) on Partner website and other promotional materials. If information concerning ENERGY STAR is provided on the Partner website as specified by the ENERGY STAR Web Linking Policy (available in the Partner Resources section of the ENERGY STAR website), EPA may provide links where appropriate to the Partner website.
- Ensure the power management feature is enabled on all ENERGY STAR qualified displays and computers in use in company facilities, particularly upon installation and after service is performed.
- Provide general information about the ENERGY STAR program to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified products.
- Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate, and communicate Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR website, etc. The plan may be as simple as providing a list of planned activities or milestones of which Partner would like EPA to be aware. For example, activities may include: (1) increasing the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrating the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) providing information to users (via the website and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products; and (4) building awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event.
- Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. The SmartWay Transport Partnership works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption,

greenhouse gases, and air pollution. For more information on SmartWay, visit www.epa.gov/smartway.

- Join EPA's Green Power Partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities. For more information on Green Power, visit www.epa.gov/greenpower.

ENERGY STAR® Product Specification
Residential Windows, Doors, and Skylights

Eligibility Criteria
Version 6.0

Following is the Version 6.0 ENERGY STAR product specification for Windows, Doors, and Skylights. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

1) **Definitions:** Below are the definitions of the relevant terms in this document. Most definitions are based on or pulled directly from the National Fenestration Rating Council (NFRC) 600 except where otherwise noted.

Product Types

A. Window: An assembled unit consisting of a frame/sash component 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 of a Residential Building. Includes Transoms.

B. Door: A sliding or swinging entry system designed for and installed in a vertical wall separating conditioned and unconditioned space in a Residential Building. Includes Sidelites. ENERGY STAR recognizes three categories of Doors and Sidelites:

   i) Opaque: A Door or Sidelite with no glazing (per NFRC 100).

   ii) ≤ ½-Lite: A Door with ≤ 900 in^2 (0.581 m^2) of glazing or a Sidelite ≤ 281 in^2 (0.181m^2) of glazing (per NFRC 100). Includes ¼- and ½-lite Doors and Sidelites.

   iii) > ½-Lite: A Door with > 900 in^2 (0.581 m^2) of glazing or a Sidelite with > 281 in^2 (0.181m^2) of glazing (per NFRC 100). Includes ¾-lite and fully glazed Doors and Sidelites.

C. Skylight: A Window designed for sloped or horizontal application in the roof of a Residential Building, the primary purpose of which is to provide daylighting and/or ventilation.

Product Subcategories

D. Sliding Door: A Door that contains one or more manually operated panels that slide horizontally within a common frame.

E. Swinging Door: A Door system having, at a minimum, 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 with the NFRC product code FXSL.

G. Transom: A fenestration product with the NFRC product code FXTR.

H. Tubular Daylighting Device (TDD) or Tubular Skylight: A non-operable device primarily designed to transmit daylight from a roof surface of a Residential Building to an interior ceiling surface via a tubular conduit. The device consists of an exterior glazed weathering surface, a light transmitting tube with a reflective inside surface and an interior sealing device, such as a translucent ceiling panel. 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. 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: The heat transfer per time per area and per degree of temperature difference (Btu/h $ft^2 \cdot °F$). 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 infra-red radiation.

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 volume of air flowing per unit time per unit area (cfm/ft^2) through a fenestration system due to air pressure or temperature difference between the outdoor and indoor environment.

Other

M. Residential Building: A structure used primarily for living and sleeping that is zoned as residential and/or subject to Residential Building codes. For the purposes of ENERGY STAR, Residential Building refers to buildings that are three stories or less in height.

N. Insulating Glass Unit (IGU): A preassembled unit, comprising 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 American Architectural Manufacturers Association (AAMA)/Window & Door Manufacturers Association (WDMA)/Canadian Standards Association (CSA) 101/I.S.2/A440 testing standard.

2) **Scope:**

A. Included Products: Products that meet the definition of a residential Window, Door, or Skylight as specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B.

B. Excluded Products: Products that are assembled onsite, including but not limited to sash packs or sash kits; Windows, Doors, or Skylights that are intended for installation in non-Residential Buildings; Window, Door, or Skylight attachments that are not included in a product's NFRC-certified rating.

3) **Qualification Criteria:**

A. Energy Efficiency Requirements: To qualify for ENERGY STAR, products shall have NFRC-certified U-Factor and, where applicable, SHGC ratings at levels which meet or exceed the minimum qualification criteria specified in Tables 1-3. Windows and Skylights shall meet the criteria for a given ENERGY STAR Climate Zone. Doors shall meet the criteria for a given glazing level. Dynamic Glazing Products shall meet the criteria while in the minimum tinted state for Chromogenic Glazing products or the "fully open" position for Internal Shading Systems. All criteria have an effective date of January 1, 2015, unless otherwise noted.

Table 1: Energy Efficiency Requirements for Windows

Climate Zone	U-Factor[1]	SHGC[2]
Northern*	≤ 0.27	Any
North-Central	≤ 0.30	≤ 0.40
South-Central	≤ 0.30	≤ 0.25
Southern	≤ 0.40	≤ 0.25

* The effective date for the Northern Zone prescriptive criteria for windows is January 1, 2016.

Table 2: Energy Efficiency Requirements for Doors			
Glazing Level	**U-Factor[1]**	**SHGC[2]**	
Opaque	≤ 0.17	No Rating	
≤ ½-Lite	≤ 0.25	≤ 0.25	
> ½-Lite	≤ 0.30	Northern and North-Central	≤ 0.40
		South-Central and Southern	≤ 0.25

Table 3: Energy Efficiency Requirements for Skylights		
Climate Zone	**U-Factor[1]**	**SHGC[2]**
Northern	≤ 0.50	Any
North-Central	≤ 0.53	≤ 0.35
South-Central	≤ 0.53	≤ 0.28
Southern	≤ 0.60	≤ 0.28

[1] Btu/h $ft^{2}\cdot^{\circ}F$
[2] Solar Heat Gain Coefficient

B. Equivalent Energy Performance: To qualify for ENERGY STAR, Windows may also have NFRC-certified U-Factor and, where applicable, SHGC ratings at levels which meet or exceed the equivalent energy performance criteria specified in Table 4. These criteria allow Windows with energy performance equivalent to the prescriptive criteria to qualify in the Northern Zone. Equivalent performance criteria are not applicable to the North-Central, South-Central, or Southern Zones or to Doors or Skylights.

Table 4: Equivalent Energy Performance for Windows		
Climate Zone	**U-Factor[1]**	**SHGC[2]**
Northern*	= 0.28	≥ 0.32
	= 0.29	≥ 0.37
	= 0.30	≥ 0.42

***** The effective date for the Northern Zone equivalent energy performance criteria for windows is January 1, 2016.

[1] Btu/h $ft^{2}\cdot^{\circ}F$
[2] Solar Heat Gain Coefficient

C. Air Leakage Requirements: To qualify for ENERGY STAR, products shall have Air Leakage ratings at levels which meet or exceed the minimum qualification criteria specified in Table 5 and adhere to the labeling requirements laid out below.

Table 5: Air Leakage Requirements	
Product	**Air Leakage Rating**
Window, Sliding Door, or Skylight	≤ 0.3 cfm/ft^{2}
Swinging Door	≤ 0.5 cfm/ft^{2}

i) Windows, Sliding Doors, and Skylights shall demonstrate adherence to this requirement by either
(1) Displaying "≤ 0.3" in the Air Leakage portion of the NFRC temporary label.
OR
(2) Placing one of the following labels on the product:
(a) AAMA Gold Label
(b) Keystone Certifications, Inc. NAFS Structural Certification Label
(c) National Accreditation & Management Institute, Inc. (NAMI) NAFS Structural Certification Label
(d) WDMA Hallmark Certification Label

NOTE: The U.S. Environmental Protection Agency (EPA) may consider similar labels offered by other Certification Bodies on a case by case basis.

ii) Swinging Doors shall demonstrate adherence to this requirement by either:
(1) Displaying "≤ 0.5" in the Air Leakage portion of the NFRC temporary label.
OR

(2) Placing one of the following labels on the product:
   (a) AAMA Gold Label
   (b) Keystone Certifications, Inc. NAFS Structural Certification Label
   (c) NAMI NAFS Structural Certification Label
   (d) WDMA Hallmark Certification Label

NOTE: EPA may consider similar labels offered by other Certification Bodies on a case by case basis.

iii) Manufacturers shall test and/or add the necessary labeling as their products come up for NFRC re-certification.

D. Installation Instructions: To qualify for ENERGY STAR, products shall have installation instructions readily available online 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. EPA 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. 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, such as www.epa.gov/lead. (Inclusion of diagrams/pictures is preferred, but optional.)

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.

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: EPA 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, EPA cannot be held liable for defects or deficiencies resulting from the proper or improper application of installation instructions.

4) **Test Requirements:**

A. When testing residential Windows, Doors, and Skylights, the test methods shown in Table 6 shall be used to determine ENERGY STAR qualification:

Table 6: Test Methods for ENERGY STAR Qualification

ENERGY STAR Requirement	Test Method Reference
U-Factor	NFRC 100
SHGC	NFRC 200
Air Leakage	ASTM E283 in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440-11

B. All products containing IGUs shall have them certified according to NFRC procedures.

5) **Effective Date:** The ENERGY STAR Residential Windows, Doors, and Skylights Version 6.0 specification shall take effect on January 1, 2015, with the exception of the Northern Zone prescriptive and equivalent energy performance criteria for windows, which shall take effect on January 1, 2016. To qualify for ENERGY STAR, a product model 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.

6) **Future Criteria Revisions:** ENERGY STAR 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 the ENERGY STAR qualification is not automatically granted for the life of a product model.

ENERGY STAR Qualification Criteria for Residential Windows, Doors, and Skylights

Windows

Climate Zone	U-Factor[1]	SHGC[2]	
Northern*	≤ 0.27	Any	Prescriptive
	= 0.28	≥ 0.32	Equivalent Energy Performance
	= 0.29	≥ 0.37	
	= 0.30	≥ 0.42	
North-Central	≤ 0.30	≤ 0.40	
South-Central	≤ 0.30	≤ 0.25	
Southern	≤ 0.40	≤ 0.25	

Air Leakage ≤ 0.3 cfm/ft^2

[1] Btu/h ft^2·°F
[2] Solar Heat Gain Coefficient

* The effective date for the Northern Zone prescriptive and equivalent energy performance criteria for windows is January 1, 2016.

Doors

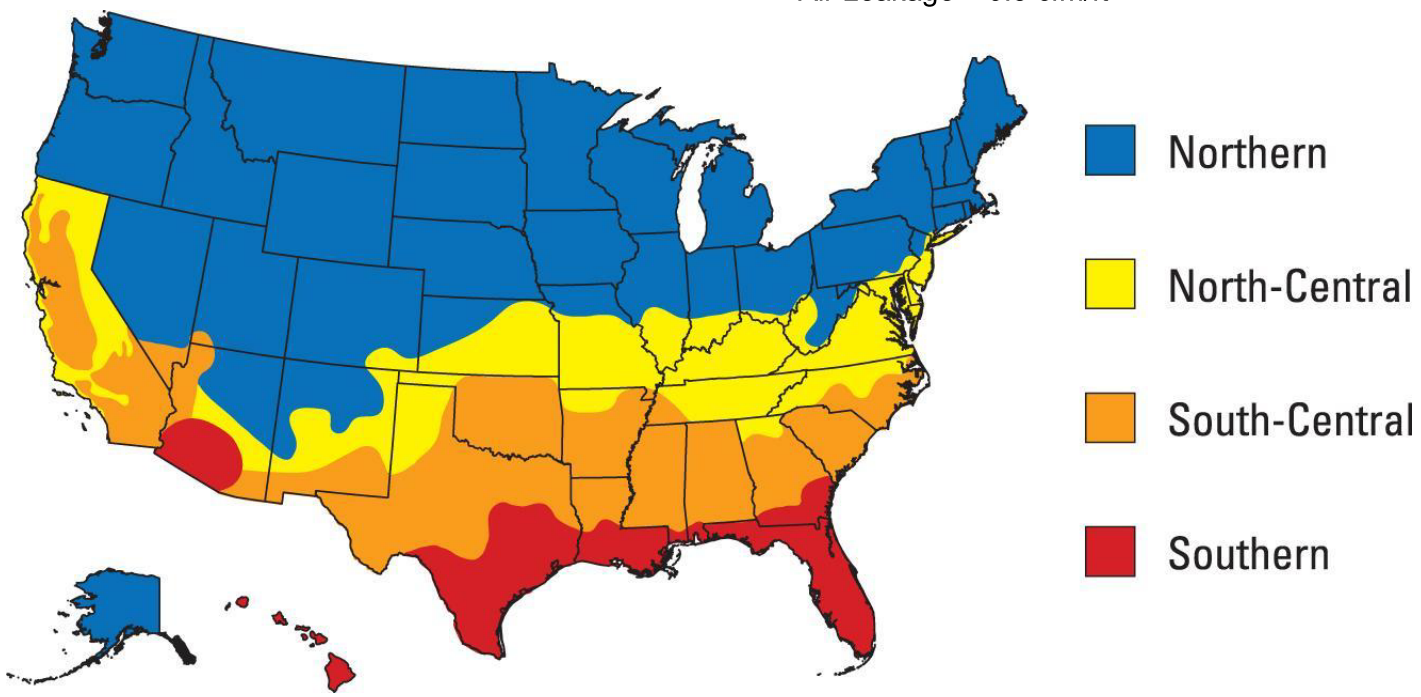
Glazing Level	U-Factor[1]	SHGC[2]	
Opaque	≤ 0.17	No Rating	
≤ ½-Lite	≤ 0.25	≤ 0.25	
> ½-Lite	≤ 0.30	Northern North-Central	≤ 0.40
		Southern South-Central	≤ 0.25

Air Leakage for Sliding Doors ≤ 0.3 cfm/ft^2
Air Leakage for Swinging Doors ≤ 0.5 cfm/ft^2

Skylights

Climate Zone	U-Factor[1]	SHGC[2]
Northern	≤ 0.50	Any
North-Central	≤ 0.53	≤ 0.35
South-Central	≤ 0.53	≤ 0.28
Southern	≤ 0.60	≤ 0.28

Air Leakage ≤ 0.3 cfm/ft^2



Note: A complete list of ENERGY STAR Climate Zones by state and county or, where applicable, zip code is available at https://www.energystar.gov/index.cfm?fuseaction=windows_doors.search_climate.