



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

Partner Commitments

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

9 **Qualifying Products**

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

18 **Using the ENERGY STAR Name and Marks**

- 19 3. Comply with current ENERGY STAR Identity Guidelines, which define how the ENERGY STAR name and
20 marks may be used. Partner is responsible for adhering to these guidelines and ensuring that its authorized
21 representatives, such as advertising agencies, dealers, and distributors, are also in compliance. The
22 ENERGY STAR Identity Guidelines are available at www.energystar.gov/logouse.
- 23 4. Use the ENERGY STAR name and marks only in association with qualified products. Partner may not refer
24 to itself as an ENERGY STAR Partner unless at least one product is qualified and offered for sale in the
25 U.S. and/or ENERGY STAR partner countries.
- 26 5. Provide clear and consistent labeling of ENERGY STAR certified residential windows, doors, and skylights.
- 27 5.1. The ENERGY STAR mark must be clearly displayed in product literature (i.e., spec sheets, catalogs,
28 etc.), and on the manufacturer's website where information about ENERGY STAR qualified models is
29 displayed.
- 30 5.2. Partner may also use the Spine Label on product packaging.
- 31 5.3. Partner shall adhere to the following product-specific commitments regarding use of the ENERGY
32 STAR mark on certified products:
- 33 5.3.1. All qualified windows, doors, and skylights must display the Product Certification Label in
34 accordance with the Partner Requirements and Resource Guidelines for Manufacturers.
- 35 5.3.2. ALL display units for certified products must display the Display Unit Label. See Labeling
36 Guidance for ENERGY STAR Windows, Doors, and Skylights for options.
- 37 5.3.3. Components may not carry an ENERGY STAR mark or label.

38 **Note:** EPA revised Section 5 to use the word 'certified' instead of 'qualified' to reflect EPA's current
39 requirements. Also, partners are directed to the Labeling Guidance for ENERGY STAR Windows, Doors,
40 and Skylights for information on acceptable labels for displays.

41 **Verifying Ongoing Product Qualification**

- 42 6. Participate in third-party verification testing through a Certification Body (CB) recognized by EPA for
43 windows, doors, and skylights as soon as a program is implemented, providing full cooperation and timely
44 responses. EPA/DOE may also, at its discretion, conduct tests on products that are referred to as ENERGY

45 STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at
46 the government's request.

47 **Providing Information to EPA**

48 7. Provide unit shipment data or other market indicators to EPA annually to assist with creation of ENERGY
49 STAR market penetration estimates, as follows:

50 7.1. Partner must submit the total number of ENERGY STAR qualified residential windows, doors, and
51 skylights shipped in the calendar year or an equivalent measurement as agreed to in advance by EPA
52 and Partner. Partner shall exclude shipments to organizations that rebrand and resell the shipments
53 (unaffiliated private labelers).

54 7.2. Partner must provide unit shipment data segmented by meaningful product characteristics (e.g., type,
55 capacity, presence of additional functions) as prescribed by EPA.

56 7.3. Partner must submit unit shipment data for each calendar year to EPA or an EPA authorized third
57 party, preferably in electronic format, no later than March 1 of the following year.

58 **Note:** EPA revised Section 7 to reflect changes to the unit shipment data submission requirement. All
59 partners will now submit unit shipment data using the standard unit shipment data submission process
60 managed by EPA annually. As an alternative, partners may use a pre-approved trade association to submit
61 aggregated unit shipment data.

62

63 8. Report to EPA any attempts by recognized laboratories or CBs to influence testing or certification results or
64 to engage in discriminatory practices.

65 9. Notify EPA of a change in the designated responsible party or contacts within 30 days using the My
66 ENERGY STAR Account tool (MESA) available at www.energystar.gov/mesa.

67 **Performance for Special Distinction**

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

- 71
- 72 ▪ Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of
73 ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.
- 74 ▪ Consider energy efficiency improvements in company facilities and pursue benchmarking buildings through
75 the ENERGY STAR Buildings program.
- 76 ▪ Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement
77 specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for
78 periodic updates and coordination. Circulate general ENERGY STAR qualified product information to
79 employees for use when purchasing products for their homes.
- 80 ▪ Feature the ENERGY STAR mark(s) on Partner website and other promotional materials. If information
81 concerning ENERGY STAR is provided on the Partner website as specified by the ENERGY STAR Web
82 Linking Policy (available in the Partner Resources section of the ENERGY STAR website), EPA may
83 provide links where appropriate to the Partner website.
- 84 ▪ Ensure the power management feature is enabled on all ENERGY STAR qualified displays and computers
85 in use in company facilities, particularly upon installation and after service is performed.
- 86 ▪ Provide general information about the ENERGY STAR program to employees whose jobs are relevant to
87 the development, marketing, sales, and service of current ENERGY STAR qualified products.
- 88 ▪ Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program
89 requirements listed above. By doing so, EPA may be able to coordinate, and communicate Partner's
90 activities, provide an EPA representative, or include news about the event in the ENERGY STAR
91 newsletter, on the ENERGY STAR website, etc. The plan may be as simple as providing a list of planned
92 activities or milestones of which Partner would like EPA to be aware. For example, activities may include:
93 (1) increasing the availability of ENERGY STAR qualified products by converting the entire product line

- 94 within two years to meet ENERGY STAR guidelines; (2) demonstrating the economic and environmental
95 benefits of energy efficiency through special in-store displays twice a year; (3) providing information to users
96 (via the website and user's manual) about energy-saving features and operating characteristics of ENERGY
97 STAR qualified products; and (4) building awareness of the ENERGY STAR Partnership and brand identity
98 by collaborating with EPA on one print advertorial and one live press event.
- 99 ▪ Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's
100 shipping operations. The SmartWay Transport Partnership works with freight carriers, shippers, and other
101 stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air
102 pollution. For more information on SmartWay, visit www.epa.gov/smartway.
 - 103 ▪ Join EPA's Green Power Partnership. EPA's Green Power Partnership encourages organizations to buy
104 green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based
105 electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies,
106 small and medium businesses, government institutions as well as a growing number of colleges and
107 universities. For more information on Green Power, visit www.epa.gov/greenpower.



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

Eligibility Criteria Final Draft Version 7.0

6 Following is the **Final Draft** Version 7.0 ENERGY STAR product specification for Windows, Doors, and
7 Skylights. A product shall meet all the identified criteria if it is to earn the ENERGY STAR.

8
9 1) **DEFINITIONS:** Below are the definitions of the relevant terms in this document. Most definitions are based
10 on or pulled directly from the National Fenestration Rating Council (NFRC) 600 except where otherwise
11 noted.

12 **Product Types**

- 13
14
15 A. Window: An assembled unit consisting of a frame/sash component holding one or more pieces of
16 glazing functioning to admit light and/or air into an enclosure and designed for a vertical installation in
17 an external wall of a Residential Building. Includes Transoms.
- 18
19 B. Door: A sliding or swinging entry system designed for and installed in a vertical wall separating
20 conditioned and unconditioned space in a Residential Building. Includes Sidelites. ENERGY STAR
21 recognizes three categories of Doors and Sidelites:
- 22
23 i) Opaque: A Door or Sidelite with no glazing (per NFRC 100).
- 24
25 ii) ≤ ½-Lite: A Door with ≤ 900 in² (0.581 m²) of glazing or a Sidelite ≤ 281 in² (0.181m²) of glazing (per
26 NFRC 100). Includes ¼- and ½-lite Doors and Sidelites.
- 27
28 iii) > ½-Lite: A Door with > 900 in² (0.581 m²) of glazing or a Sidelite with > 281 in² (0.181m²) of glazing
29 (per NFRC 100). Includes ¾-lite and fully glazed Doors and Sidelites.
- 30
31 C. Skylight: A Window designed for sloped or horizontal application in the roof of a Residential Building,
32 the primary purpose of which is to provide daylighting and/or ventilation.

33 **Product Subcategories**

- 34
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36 D. Sliding Glass Door: A Door that contains one or more manually operated glass panels that slide
37 horizontally within a common frame, categorized with the NFRC product code DDSG.
- 38
39 E. Swinging Door: A Door system having a hinge attachment of any type between a leaf and jamb, mullion,
40 or edge of another leaf or having a single, fixed vertical axis about which the leaf rotates between open
41 and closed positions. Swinging Doors include NFRC codes EDSL and DDFR.
- 42
43 F. Sidelite: A fenestration product with the NFRC product code FXSL.
- 44
45 G. Transom: A fenestration product with the NFRC product code FXTR.
- 46
47 H. Tubular Daylighting Device (TDD) or Tubular Skylight: A non-operable device primarily designed to
48 transmit daylight from a roof surface of a Residential Building to an interior ceiling surface via a tubular
49 conduit. The device consists of an exterior glazed weathering surface, a light transmitting tube with a
50 reflective inside surface and an interior sealing device, such as a translucent ceiling panel. TDDs are
51 considered Skylights.
- 52
53 I. Dynamic Glazing Product: Any fenestration product that has the fully reversible ability to change its
54 performance properties, including U-Factor, Solar Heat Gain Coefficient (SHGC), or Visual
55 Transmittance. This includes, but is not limited to, shading systems between the glazing layers and
56 Chromogenic Glazing.
- 57
58 i) Chromogenic Glazing: A broad class of changeable glazings that have means to reversibly vary
59 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 ft²·°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/ft²) 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 certification, with the exception of products listed in Section 2.B. Products that are covered under other ENERGY STAR product specifications are not eligible for certification under this specification. The list of specifications currently in effect can be found at www.energystar.gov/specifications.
- 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) **CERTIFICATION CRITERIA:**

- A. Energy Efficiency Requirements: Products shall have NFRC-certified U-Factor and, where applicable, SHGC ratings at levels which meet or exceed the minimum criteria specified in Tables 1 through 3. Windows, sliding glass doors, and skylights shall meet the criteria for a given ENERGY STAR Climate Zone. Swinging 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.

Table 1: Energy Efficiency Requirements for Windows

Climate Zone	U-Factor	SHGC
Northern	≤ 0.22	≥ 0.17
North-Central	≤ 0.25	≤ 0.40
South-Central	≤ 0.28	≤ 0.23
Southern	≤ 0.32	≤ 0.23

Note: EPA received stakeholder feedback requesting that the North-Central zone U-factor requirement be eased to allow greater selection of products and other feedback that indicated the current requirement is acceptable as is. EPA made an adjustment to the North-Central zone U-factor criterion moving it from ≤ 0.24 to ≤ 0.25 . This modest adjustment allows some additional products to qualify, but results in only a small loss in energy savings. EPA is not adjusting the Northern zone criterion as U-factor trade-offs at $U=0.25$ and $U=0.26$ already meet the proposed criteria for Version 7.0.

Table 2: Energy Efficiency Requirements for Doors

Glazing Level	U-Factor	SHGC	
Opaque	≤ 0.17	No Rating	
$\leq \frac{1}{2}$ -Lite	≤ 0.23	≤ 0.23	
$> \frac{1}{2}$ -Lite	≤ 0.25	Northern and North-Central	≤ 0.40
	≤ 0.28	South-Central and Southern	≤ 0.23

Note: EPA received stakeholder feedback from several commenters requesting that the $> \frac{1}{2}$ -Lite door U-factor criteria for the South-Central and Southern zones be made less stringent to allow greater selection among certified products. EPA is made an adjustment to the $> \frac{1}{2}$ -Lite South-Central and Southern zone U-factor requirements, moving them from ≤ 0.25 to ≤ 0.28 . This allows greater product selection with only a small reduction in savings since additional gains in SHGC were also implemented as part of this revision.

Table 3: Energy Efficiency Requirements for Skylights

Climate Zone	U-Factor	SHGC
Northern	≤ 0.45	Any
North-Central South-Central Southern	≤ 0.50	≤ 0.25

- B. Equivalent Energy Performance: Windows may also have NFRC-certified U-Factor and 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 be certified for 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	$= 0.23$	≥ 0.35
	$= 0.24$	≥ 0.35
	$= 0.25$	≥ 0.40
	$= 0.26$	≥ 0.40

- C. Air Leakage Requirements: Products shall have Air Leakage ratings at levels which meet or exceed the minimum 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

153 (1) Displaying “≤ 0.3” in the Air Leakage portion of the NFRC temporary label.

154 OR

155 (2) Placing one of the following labels on the product:

156 (a) AAMA Gold Label

157 (b) Keystone Certifications, Inc. NAFS Structural Certification Label

158 (c) National Accreditation & Management Institute, Inc. (NAMI) NAFS Structural Certification
159 Label

160 (d) WDMA Hallmark Certification Label

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

163
164 ii) Swinging Doors shall demonstrate adherence to this requirement by either:

165 (1) Displaying “≤ 0.5” in the Air Leakage portion of the NFRC temporary label.

166 OR

167
168 (2) Placing one of the following labels on the product:

169 (a) AAMA Gold Label

170 (b) Keystone Certifications, Inc. NAFS Structural Certification Label

171 (c) NAMI NAFS Structural Certification Label

172 (d) WDMA Hallmark Certification Label

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

175
176 iii) Manufacturers shall test and/or add the necessary labeling as their products come up for NFRC re-
177 certification.

178
179
180 D. Installation Instructions: Products shall have installation instructions readily available online or packaged
181 with the product. This information does not need to be included on product labels. Electronic versions of
182 instructions may be provided on the website of a retailer, manufacturer, and/or industry association.
183 Retailers, manufacturers, and industry associations may include in these instructions whatever
184 disclaimers they feel are necessary to limit their liability. EPA understands that the manufacturer cannot
185 write installation instructions for every situation and that generic instructions covering the most common
186 situations are acceptable to fulfill this requirement. The installation instructions shall include:

187
188 i) A list of hardware and tools required for installation, including those provided by the manufacturer
189 and those not provided by the manufacturer.

190
191 ii) Diagrams/pictures and descriptions of the product or a typical product of similar type and parts
192 provided by the manufacturer.

193
194 iii) General guidance on safely removing old products and preparing the frame for installation.
195 Guidance should direct consumers to relevant content on proper management of lead paint, such
196 as www.epa.gov/lead. (Inclusion of diagrams/pictures is preferred, but optional.)

197
198 iv) General information on proper disposal or recycling of products being removed.

199
200 v) Detailed flashing instructions including diagrams/pictures or reference to the applicable flashing
201 manufacturer’s instructions, as applicable to the product.

202
203 vi) Instructions on properly shimming the product to achieve an installation that is flush, level, and
204 plumb. (Inclusion of diagrams/pictures is preferred, but optional.)

205
206 vii) Guidance on sealing and weatherproofing to prevent air and water infiltration at the product-wall
207 interface. (Inclusion of diagrams/pictures is preferred, but optional.)

208
209 viii) Variations of the above based on whether the job is a pocket installation, rough opening installation
210 with exterior sheathing intact, and/or rough opening installation with exterior sheathing removed, as
211 applicable to the product.

212
213 Disclaimer: EPA makes no warranties, expressed or implied, nor assumes any legal liability or
214 responsibility for the accuracy, completeness, or usefulness of the contents of installation instructions,

215 or any portion thereof. Further, EPA cannot be held liable for defects or deficiencies resulting from the
216 proper or improper application of installation instructions.

217
218 4) **TESTING:**

- 219
220 A. When testing residential Windows, Doors, and Skylights, the test methods shown in Table 6 shall be
221 used to determine ENERGY STAR certification:

222
223 **Table 6: Test Methods for ENERGY STAR Certification**

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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

- 225
226 B. All products containing IGUs shall have them certified according to NFRC procedures.
227
228 C. U-factor recertification shall occur every 5 years. Air leakage recertification shall occur every 10 years.

229 **Note:** EPA is proposing to align with the National Fenestration Rating Council's current policy to require
230 product U-factor recertification every 5 years and air leakage recertification every 10 years. This
231 requirement will now be independent of the NFRC requirements. EPA is adding this requirement to preserve
232 the current ENERGY STAR certification scheme and data quality requirements.

- 233
234
235 5) **EFFECTIVE DATE:** The ENERGY STAR Version 7.0 Residential Windows, Doors, and Skylight's
236 specification shall take effect **TBD**. To meet the ENERGY STAR criteria, a product model shall meet the
237 ENERGY STAR specification in effect on the model's date of manufacture. The date of manufacture is
238 specific to each unit and is the date on which a unit is considered to be completely assembled.
239

240 **Note:** EPA is proposing that the ENERGY STAR Version 7.0 Residential Windows, Doors, and Skylight's
241 specification will take effect 12 months after the criteria are finalized.

- 242
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244
245 6) **CONSIDERATIONS FOR FUTURE REVISIONS:** ENERGY STAR reserves the right to change the
246 specification should technological and/or market changes affect its usefulness to consumers, industry, or the
247 environment. In keeping with current policy, revisions to the specification are arrived at through stakeholder
248 discussions. In the event of a specification revision, please note that the ENERGY STAR certification is not
249 automatically granted for the life of a product model.
250

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

Windows

Climate Zone	U-Factor ¹	SHGC ²	
Northern	≤ 0.22	≥ 0.17	Prescriptive
	= 0.23	≥ 0.35	Equivalent Energy Performance
	= 0.24	≥ 0.35	
	= 0.25	≥ 0.40	
	= 0.26	≥ 0.40	
North-Central	≤ 0.25	≤ 0.40	
South-Central	≤ 0.28	≤ 0.23	
Southern	≤ 0.32	≤ 0.23	

Swinging and Sliding Glass Doors

Glazing Level	U-Factor ¹	SHGC ²
Opaque	≤ 0.17	No Rating
≤ ½-Lite	≤ 0.23	≤ 0.23
> ½-Lite	≤ 0.25	Northern & North-Central
	≤ 0.28	Southern & South-Central

264 Air Leakage for Sliding Doors ≤ 0.3 cfm/ft²

265 Air Leakage for Swinging Doors ≤ 0.5 cfm/ft²

266

267

Skylights

Climate Zone	U-Factor ¹	SHGC ²
Northern	≤ 0.45	Any
North-Central		
South-Central	≤ 0.50	≤ 0.25
Southern		

268 Air Leakage ≤ 0.3 cfm/ft²

257 Air Leakage for windows and sliding glass doors ≤ 0.3 cfm/ft²

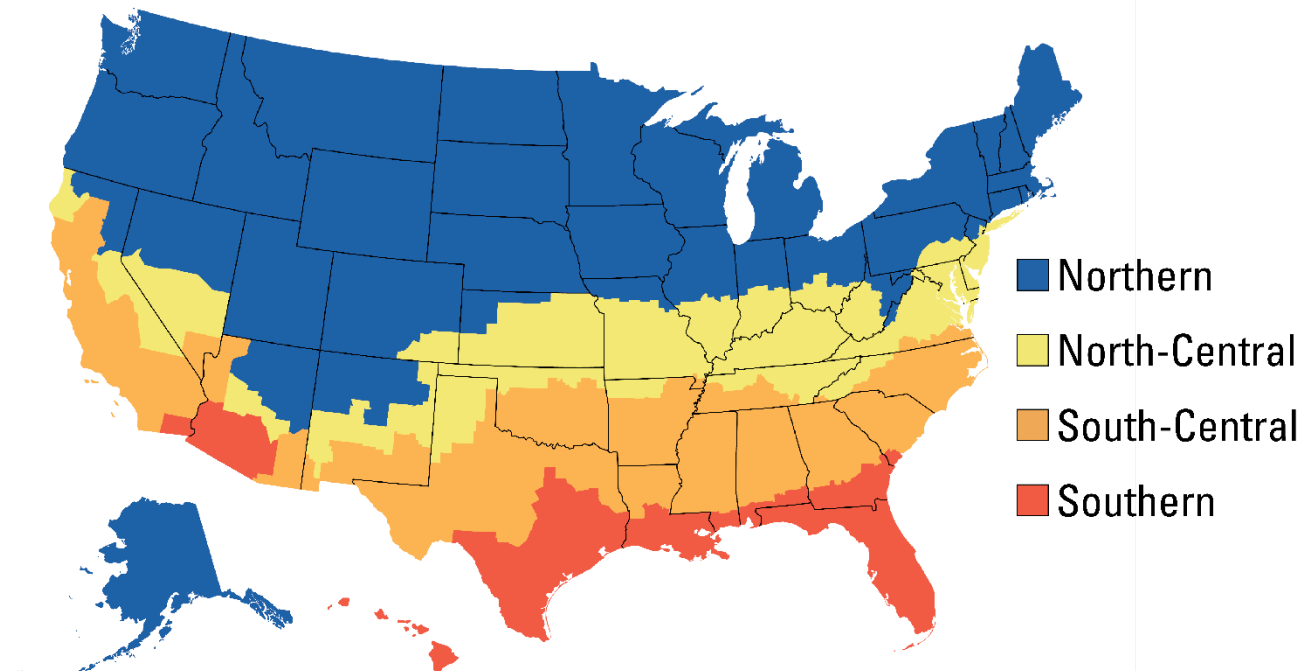
258 ¹ Btu/h ft²·°F

259 ² Solar Heat Gain Coefficient

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261

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270

271 **Note:** A complete list of ENERGY STAR Climate Zones by state and county or, where applicable, zip code is available at
272 www.energystar.gov/products/building_products/residential_windows_doors_and_skylights/climate_zone/search.

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Note: The ENERGY STAR Climate Zone map has changed to reflect various counties across the U.S. moving into a different International Energy Conservation Code (IECC) zones as a result of changing climate patterns. Please see the Criteria Analysis Report for more information.

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