



# **ENERGY STAR<sup>®</sup> Storm Window Certification Body (CB) Webinar**

**September 13, 2018**

**ENERGY STAR Residential and Products Programs**



# Specification Information

- Specification is posted on the Storm Windows partner resources page: [https://www.energystar.gov/products/storm\\_windows/partners](https://www.energystar.gov/products/storm_windows/partners)
- Specification Development materials are available on the Storm Window Product Development Web page at [www.energystar.gov/NewSpecs](http://www.energystar.gov/NewSpecs)
  - Follow link to *Version 1.0 is in Development* under ‘Exterior and Interior Storm Panels’

The screenshot shows the ENERGY STAR website interface. At the top, there is a navigation bar with links for 'ABOUT ENERGY STAR' and 'PARTNER RESOURCES'. Below this is the ENERGY STAR logo and the tagline 'The simple choice for energy efficiency.' The main navigation area features four categories: 'ENERGY EFFICIENT products', 'ENERGY SAVINGS at home', 'ENERGY EFFICIENT new homes', and 'ENERGY STRATEGIES FOR buildings & plants'. The breadcrumb trail indicates the current page is 'Home > Certified Products > Exterior and Interior Storm Windows (Panels) Version 1.0'. The page title is 'Exterior and Interior Storm Windows (Panels) Version 1.0' and the subtitle is 'Your source for energy efficient product information'. A navigation bar below the title lists 'All Certified Products', 'Appliances', 'Lighting', 'Office Equipment', 'Electronics', and 'Product Specifications Search'. The main content area contains the following text: 'The ENERGY STAR Version 1.0 specification for exterior and interior storm windows (also known as storm panels) is currently in development. Materials related to this revision process are provided below. Partners and other interested parties with questions or concerns regarding these materials or the revision process can contact Doug Anderson, EPA, at [windows@energystar.gov](mailto:windows@energystar.gov).' Below this is the title 'ENERGY STAR for Exterior and Interior Storm Windows – Final Draft Specification and Response to Comments – July 2018' and a list of documents for download: 'ENERGY STAR Storm Windows Final Draft Version 1 Cover Letter (PDF, 48 KB)', 'ENERGY STAR Storm Windows Final Draft Version 1 Specification (PDF, 351 KB)', and 'Response to Comments on Storm Windows Draft 2 Specification (PDF, 268 KB)'. At the bottom, there is a section for 'Stakeholder Comments on ENERGY STAR for Storm Windows – Draft 2 Specification and Additional Analysis - May 21, 2018' with a list of documents: 'AGC Glass Company North America, Inc. (PDF, 52 KB)', 'Andersen Corporation (PDF, 144 KB)', and 'Attachments Energy Rating Council (AERC) (PDF, 468 KB)'.



# Webinar Agenda

- Introductions
- Background
- Definitions
- Storm Window Labels
- Scope
- Certification and Verification
- Timeline and Application Process



# Introductions

**Doug Anderson** – U.S. Environmental Protection Agency

**Kathleen Vokes** – U.S. Environmental Protection Agency

**Brian Krausz** – U.S. Environmental Protection Agency

**Quinn Wilson** – ICF

**Mary Beliveau** – ICF



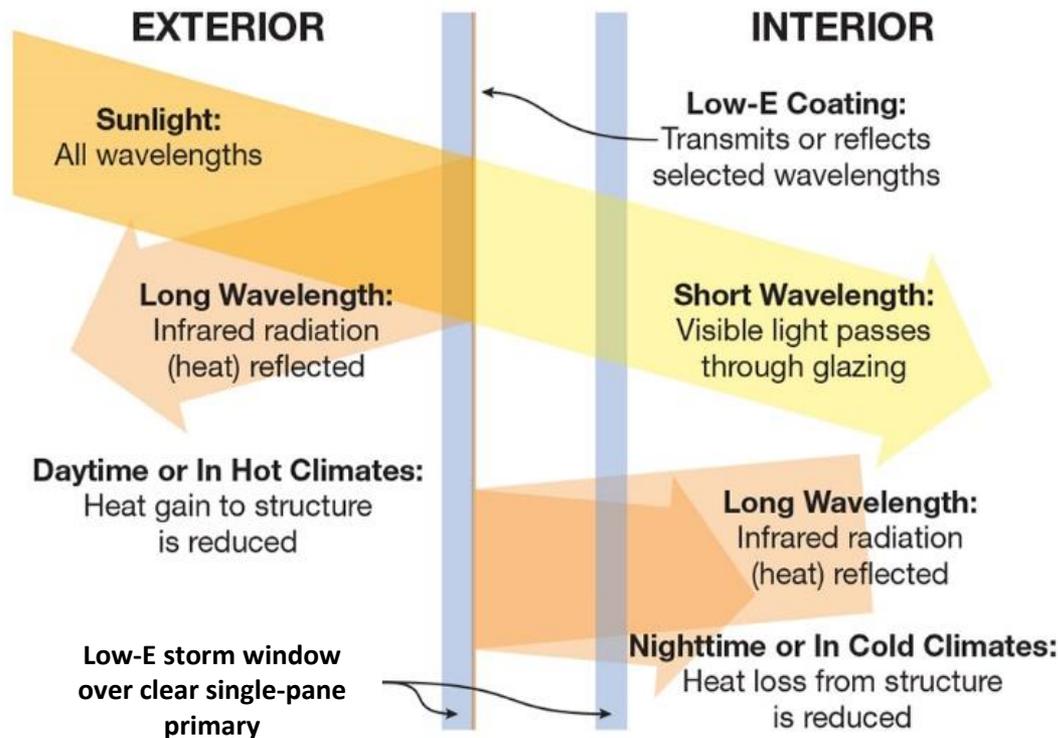
# Specification Development Process

- **Jan 2016 - Framework Document issued**
- **July 2017 - Draft 1 and Criteria Analysis Report released**
- **April 2018 - Draft 2 and Additional Analysis released**
- **July 2018 - Final Draft released**
- **September 2018 – Version 1.0 (Final) released**

All documents posted on the [specification development webpage](#)

# How Storm Windows Save Energy

## Low-E Coating Performance



- Low-Emissivity coatings reflect infrared radiation
- Additional air gap improves insulation by reducing convection-related heat loss
- Specialized “Solar Control” Low-E coatings can be used to reduce heat gain in cooling climates
- Installing storm windows can also reduce can air leakage by up to 90%



## Definitions

- **Exterior Storm Window**: A fenestration attachment product consisting of a frame component and one or more pieces of glazing, installed over the exterior of a primary window in a residential building.
- **Interior Storm Window**: A fenestration attachment product consisting of a frame component and one or more pieces of glazing, installed over the interior of a primary window in a residential building.
- **Primary 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 vertical installation in an external wall of a residential building.



## Definitions

- **Operator Type**: A designation used to distinguish between fenestration products based on how and whether the products open and close.
- **Operable product**: A product with panels that may be opened and shut to accommodate ventilation needs.
  - Vertical slider (double hung)
  - Horizontal Slider
  - Projection (casement, awning, hopper)
  - Combination (multiple types in one unit)
- **Non-operable product**: A product with panels that do not open (also called “fixed”).
- **Low-E Coating**: A microscopically thin metal or metallic oxide composition that is deposited directly on a glazing surface to reduce its thermal infrared emittance.

# Product Variations



*Interior Fixed Panel*



*Exterior Operable Panel*



*Exterior Fixed Panel*



## Definitions (Performance Metrics)

- **Emissivity**: The relative ability of a surface to reflect or emit heat by radiation. Emissivity ranges from 0 to 1.
- **Solar Transmittance (T<sub>sol</sub>)**: The ratio of transmitted radiant flux in the solar spectrum (300 nm to 2500 nm) to incident radiant flux in the solar spectrum.
- **Air Leakage**: A measure of the rate of air passing through a material or assembly in the presence of an applied pressure difference, expressed in units of cfm/ft<sup>2</sup> (L/s/m<sup>2</sup>).



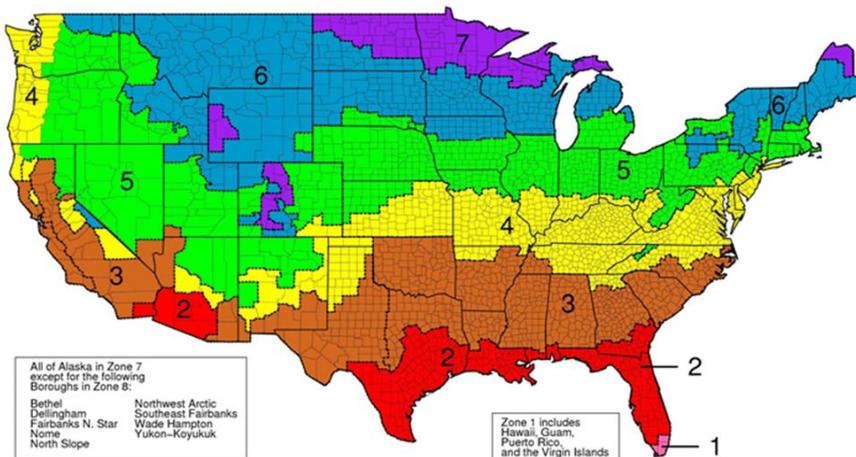
## Definitions

- **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 fewer in height.
- **Weep Hole**: Small openings in the frame of an exterior storm window that allow water to drain out from between the storm window and the primary window.
- **Thermal Break**: Low-conductivity materials such as wood, plastic or other non-metal material placed between two conductive materials to limit heat flow; in the context of storm windows, thermal breaks are used with metal frame windows.

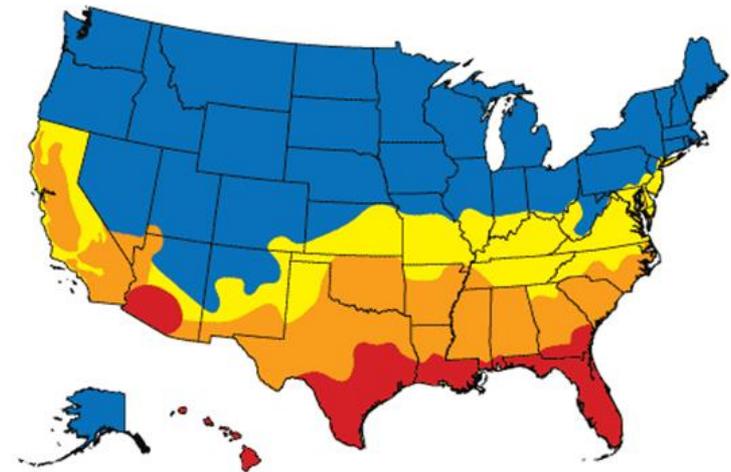
# Definitions

**Climate Zone:** Geographic regions that share general climatic conditions, such as a range of heating degree days and cooling degree days. The climate zones referenced are defined in the ENERGY STAR Windows, Doors and Skylights Program. These zones are based on the International Energy Conservation Code (IECC), with some modifications.

IECC Climate Zones (8)



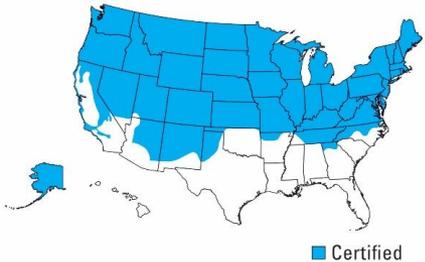
ENERGY STAR Climate Zones for Windows, Doors and Skylights (4)



# ENERGY STAR Storm Window Labels

- Low-E storm windows are cost-effective in all IECC or ENERGY STAR Zones.
- High SHGC products (“high gain”) should be used in heating climates
- Low SHGC products (“solar control”) should be used in cooling climates
- The benefit is about the same in Zone 4 (NC Zone) so either type may be used

ENERGY STAR® Certified Storm Window  
Certified in Highlighted Regions



■ Certified



Learn More at:  
[www.energystar.gov/stormwindows](http://www.energystar.gov/stormwindows)

**Label 1: North/North-Central Zone**

ENERGY STAR® Certified Storm Window  
Certified in Highlighted Regions



■ Certified



Learn More at:  
[www.energystar.gov/stormwindows](http://www.energystar.gov/stormwindows)

**Label 2: North-Central/South-Central/South Zone**



# Scope

- **Included Products**: Products that meet the definition of exterior and interior storm windows that are intended for use in residential buildings as specified herein and are eligible for ENERGY STAR certification, with the exception of products listed under excluded products.
- **Excluded Products**: Products described below are ineligible for ENERGY STAR certification.
  - Exterior storm windows without **weep holes** or other features that allow moisture to drain from between the storm window and primary window.
  - Storm windows that are intended for non-residential buildings.
  - Storm doors.
  - Partial components of an exterior or interior storm window.



# Certification Criteria

- **Energy Efficiency Requirements:** For ENERGY STAR certification, product glazing must have Emissivity and Solar Transmissions ratings confirmed by an EPA-approved third-party laboratory at levels which meet or exceed the certification criteria for a given climate zone.

ENERGY STAR Climate Zone	Emissivity	Solar Transmission
Northern	$\leq 0.22$	$> 0.55$
North-Central (IECC Zone 4)	$\leq 0.22$	Any
South-Central	$\leq 0.22$	$\leq 0.55$
Southern	$\leq 0.22$	$\leq 0.55$

- **Air Leakage Requirements:** For ENERGY STAR certification, products must have Air Leakage ratings at levels which meet or exceed the certification criteria.

Product	Air Leakage Rating
Exterior Storm Window	$\leq 1.5$ cfm/ft <sup>2</sup>
Interior Storm Window	$\leq 0.5$ cfm/ft <sup>2</sup>



# General Requirements

**Installation Instructions:** For ENERGY STAR certification, storm window partners must provide installation instructions either online (with a Web address on the package) or packaged with the product. **Certification Bodies are responsible for verifying that partners provide this information.** The electronic versions of instructions may be provided on the Web site of the retailer, manufacturer and/or industry association. The instructions must include the following:

- 1) A list of hardware and tools required for installation.
- 2) Diagrams and descriptions of product installation.
- 3) Guidance on proper installation distance from the primary window.
- 4) Guidance on the need for **thermal breaks** when installed over metal frame primary windows.
- 5) Guidance on properly sealed installation.
- 6) Guidance on safe removal and recycling of existing storm windows, if applicable.
- 7) Information on the applicability of the storm window operator type to the primary window operator type, especially with respect to any emergency egress requirements.
- 8) Provide a reference to the safety requirements defined in local building codes.



# Performance Metrics

The test methods shown below are used to determine the ENERGY STAR certification for exterior and interior storm windows.

ENERGY STAR Requirement	Test Method Reference
Emissivity	National Fenestration Rating Council (NFRC) 301
Solar Transmittance (Tsol)	NFRC 300
Air Leakage	Attachments Energy Rating Council (AERC) 1.2 in accordance with ASTM E283

Emissivity and Solar Transmittance results will be provided in a test report from a laboratory participating in the Lawrence Berkeley National Laboratory (LBNL) Inter-Laboratory Comparison (ILC). EPA-recognized laboratories will confirm (with a hand-held device) that the provided product sample(s) match the glazing sample provided for certification. EPA-recognized Laboratories are responsible for testing Air Leakage of the products.

Certification Bodies are responsible for certifying the results of the laboratory comparison for the Emissivity and Solar Transmittance tests. Certification Bodies will also certify the results of the Air Leakage test.



## Certification Process - background

The glazing (glass or plastic) in the storm window is the performance driver for this product category:

- Glazing is certified in laboratories participating in the Lawrence Berkeley National Lab (LBNL) Inter-Laboratory Comparison (ILC) program. The resulting certified data go into the International Glazing Database (IGDB) managed by LBNL. This data includes NFRC tests 301 for emissivity and 300 for solar transmittance.
- Companies use the ILC test results in the IGDB to select the glazing for their storm window products.
- For ENERGY STAR Storm Window Certification, the ILC certification information will be provided to the laboratory along with sample products and a glazing sample from the glass manufacturer.
- For the ENERGY STAR Certification and Verification process, the laboratory must confirm (with a hand-held device) that the glazing in the product is what the company claims it is.



## Certification Process - background

The air leakage of each storm window sample is also tested and certified:

- Air Leakage test ASTM E283 is required for 'regular' windows and doors. However, storm windows have 'weep-holes' and are not as tight and would not meet the typical 'window' results.
- AERC developed an addendum to ASTM E283 for testing storm windows called AERC 1.2 which places the window over a PMMA acrylic panel with a set amount of leakage. The addendum tests the total leakage over the storm window and the PMMA acrylic panel to simulate a real-life situation.
- The results of the AERC 1.2 addendum to ASTM E283 air leakage testing must be reported in the QPX.
- If a company has done ASTM E283 testing of the product, CBs should report those results. Those results will not be public-facing. The results will be used for internal analysis.



# Certification Process

## 1. The laboratory reviews the following:

- Sample products (standard size, fixed and operable) from the storm windows partner,
- Product characteristics and information (for QPX form),
- Certified test results (of NFRC tests 300 and 301) for the glass from a laboratory participating in LBNL Inter-Laboratory Comparison
- At minimum, a 7"x 7" sample of the low-e glass from the glass manufacturer used in the product.

## 2. The laboratory confirms that the glass properties of the submitted storm window product match the properties of the low-e glass sample provided by the glass manufacturer. The laboratory may perform this check using:

- EDTM Glass Check PRO (coating type, which surface has coating),
- EDTM Solar Spectrum Meter (Solar transmittance), or
- Other equipment of similar or better performance (actual emissivity determination).



## Certification Process (continued)

3. The laboratory also tests for air leakage performance per AERC 1.2 in accordance with ASTM E283.
4. The laboratory fills out a lab report with the required submission data, which is then provided to an EPA-recognized certification body for purposes of certification.
5. The CB reviews all test data and the installation instructions. If documentation sufficient, the CB certifies the model and then submits the certified product data to EPA. All certified product data for currently available models will be available for consumers on the ENERGY STAR Web site.



# Application Process

In order to apply for recognition to certify storm windows, please submit the following information to [certification@energystar.gov](mailto:certification@energystar.gov):

1. A signed CB application, which includes all existing product categories for which you are recognized, in addition to storm windows
2. Evidence that you have contacted your accreditation body requesting a scope expansion for the Storm Windows program
3. Confirmation that you have submitted test data successfully to EPA via the web service for Storm Windows once the web service is available for testing



## Application Process (continued)

- EPA will recognize CBs for this new category pending a formal scope expansion from an accreditation body.
- The submission deadline for those CBs that want to be among the first batch recognized will be October 5, 2018.
- EPA will announce CBs recognized for storm windows by October 10, 2018.
- EPA will continue to accept applications on a rolling basis after October 5.

<b>Initial Applications Submission Deadline</b>
<b>October 5, 2018</b>



# Submitting Test XML to EPA

In order to become recognized to certify storm windows products, CBs are required to successfully submit a test XML submission to EPA through the storm windows web service.

Additional resources regarding QPX testing can be found below:

1. [EPA's ENERGY STAR Qualified Products Exchange \(QPX\) Reference Document](#)
2. [XML Web Services Submission Process](#)
3. [Storm Windows Data Requirements](#)

Please contact [Certification@energystar.gov](mailto:Certification@energystar.gov) with any questions.



## Version 1.0 Timeline

- September 13, 2018: Storm Window CB Training Webinar
- September 24, 2018: Deadline for comments on the QPX requirements
- End of September 2018: Web services available for testing
- October 5, 2018: Deadline for CB applications in order to be included in October 10<sup>th</sup> announcement
- October 10, 2018: EPA announces recognized CBs
- Mid-October 2018: Web service live and available for certification submissions



# Thank you!

To be added to EPA's storm windows stakeholder mailing list, please email:  
[windows@energystar.gov](mailto:windows@energystar.gov)

For questions regarding certification of storm windows products, please email:  
[Certification@energystar.gov](mailto:Certification@energystar.gov)

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