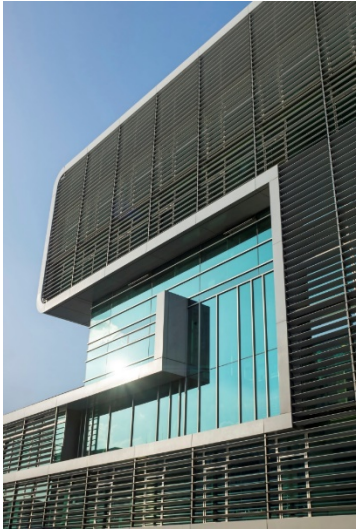


Certification and Rating of Attachments for Fenestration Technologies

2017 Building Technologies Office Peer Review



Energy Efficiency &
Renewable Energy

Ralph Vasami, rvasami@kellencompany.com
Window Covering Manufacturers Association

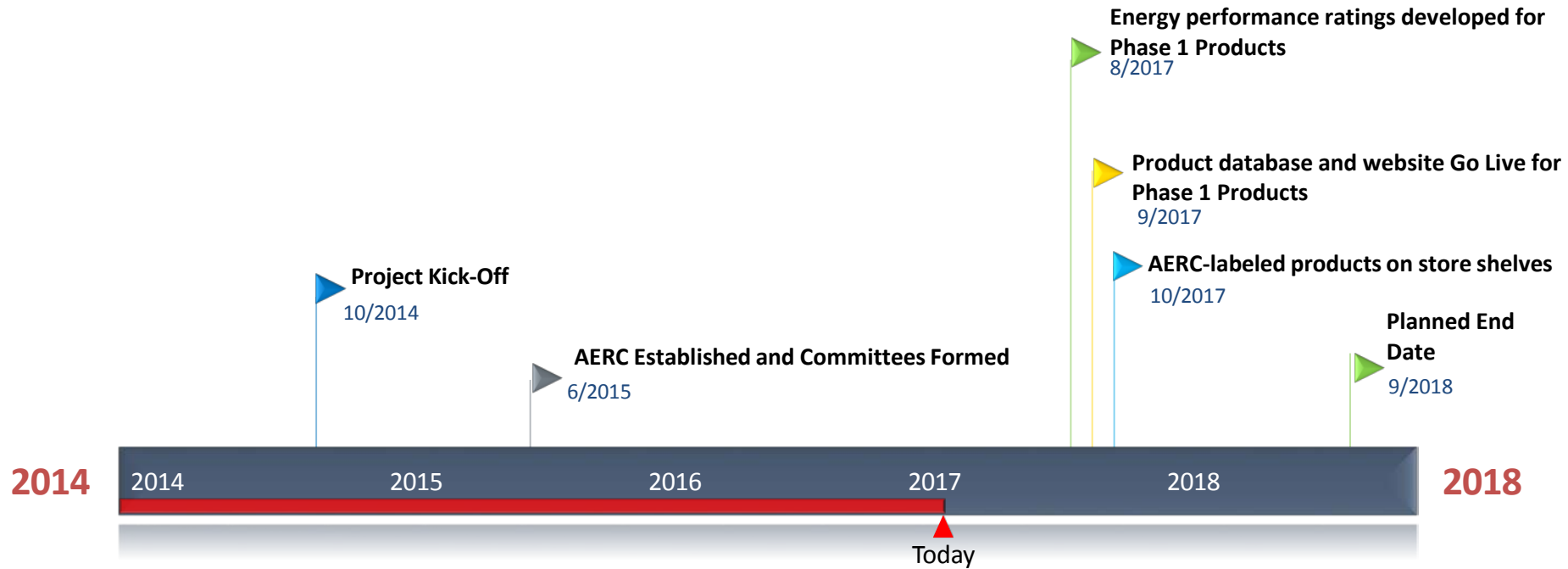
Project Summary

- Goals:
 - Develop an energy performance rating, certification, labeling and performance verification program for residential and commercial window attachments.
 - Deliver and maintain a publicly available, searchable website (and database) of certified window attachment product performance, including energy performance.

Partners

Organization Name	Role(s)
Window Coverings Manufacturers Association (WCMA)	<ul style="list-style-type: none">• Oversee and coordinate the development of AERC• Responsible for management of the budget, reporting to DOE, ensuring milestones in the DOE Statement of Project Objectives (SOPO)
Kellen Company	<ul style="list-style-type: none">• Project management and communications• Manage both WCMA and AERC
D+R International	<ul style="list-style-type: none">• Provide guidance and strategic support, stakeholder engagement, committee level support, and help to ensure milestones and deadlines are met
Intertek-ATI	<ul style="list-style-type: none">• Provides independent testing, product certification, and quality assurance
Lawrence Berkeley National Laboratory (LBNL)	<ul style="list-style-type: none">• Windows and Daylighting Group• Simulation and modeling software and training• Complex Glazing Database maintenance and updates

Project Timeline and Milestones



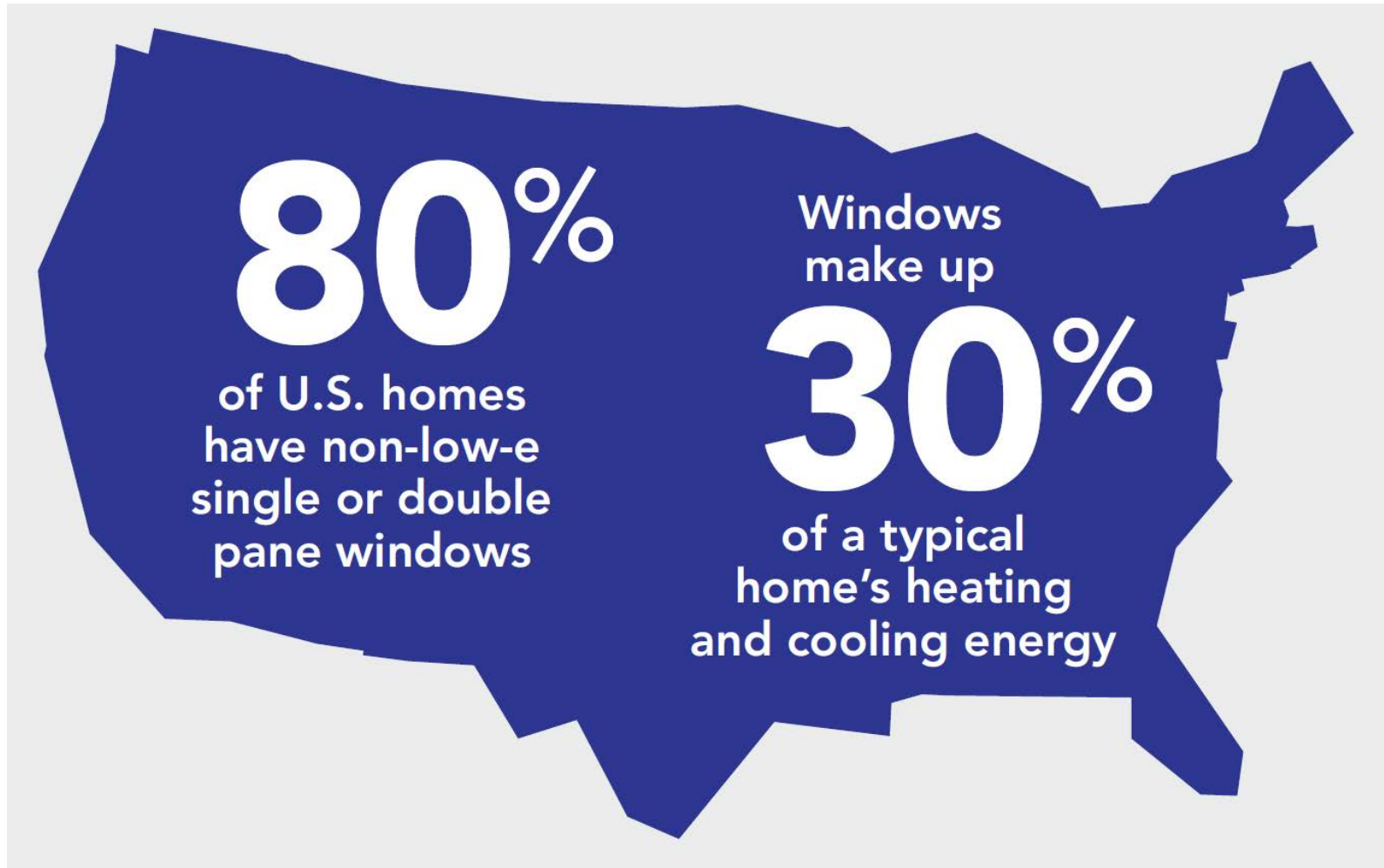
Purpose and Objectives

Project Background:

- DOE has funded development of advanced window technology, testing and simulation (low-e coating, WINDOW, etc.) for the past 30+ years and funded development of the National Fenestration Rating Council.
- Windows contribute substantially to residential and commercial building energy consumption (Residential – 2.57 quads, Commercial – 1.71 quads).*
- Window attachments can be a cost-effective option, but there was no standard method to assess or allow consumers to compare the energy performance of window attachment products.

*BTO Source: Sawyer, K. *Windows and Building Envelope Research and Development: Roadmap for Emerging Technologies*. Washington, DC: U.S. Department of Energy, 2014. Accessed Mar. 14, 2016. http://energy.gov/sites/prod/files/2014/02/f8/BTO_windows_and_envelope_report_3.pdf.

Most U.S. Homes Have Inefficient Windows



New Opportunity: Window Attachments



Window attachments

can upgrade the performance of existing windows and save up to **13%** of a household's annual energy use.

What are Window Attachments?

- Products installed over windows or doors in residential or commercial buildings
- Interior products often referred to as window treatments or window fashions

Horizontal Blinds



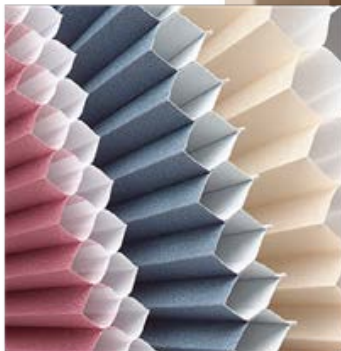
Interior Shutters



Roller Shades



Cellular Shades



What are Window Attachments?

Exterior Low-E Storm Windows*



*Storm windows can be sold as exterior and interior products

- Window attachment products can also be affixed to the exterior of a home or commercial building
- Many products can be motorized or automated with controls

Exterior Roller Shutters



Exterior Roller Shades



Awnings



Large Opportunity

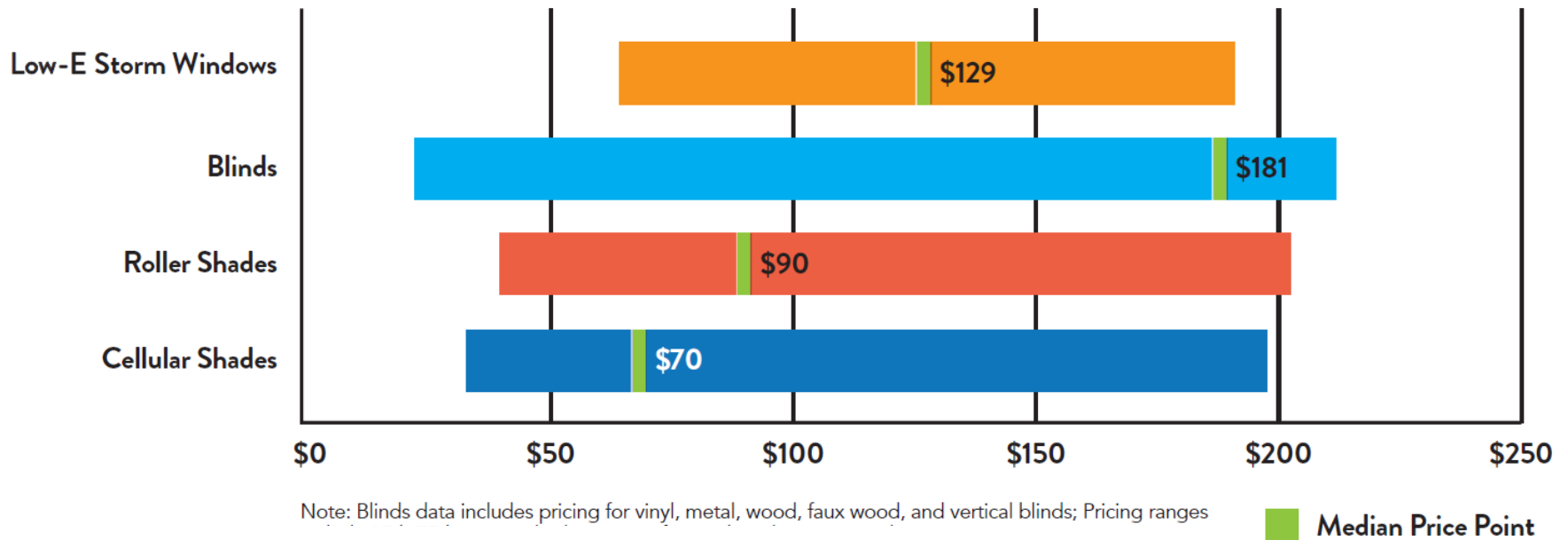


- ✓ **FIELD DEMONSTRATED ENERGY SAVINGS:**
3%-30%
- ✓ **LOWER COST MEASURE:**
\$100 median price per window
- ✓ **YEAR ROUND BENEFITS:**
 - Heating: 20 - 500 therms/year
 - Cooling: 700 - 5,200 kwh/year
- ✓ **HIGH MARKET POTENTIAL:**
 - 150 million+ attachments shipped annually
 - 4-16 year lifetimes

- Window attachments offer a significant opportunity to save energy:
 - Field demonstrated energy savings
 - Heating and cooling savings
 - Wide range of prices, with median prices around \$100
 - Easily accessible to consumers
 - DIY
 - Large market

Window Attachment Benefits

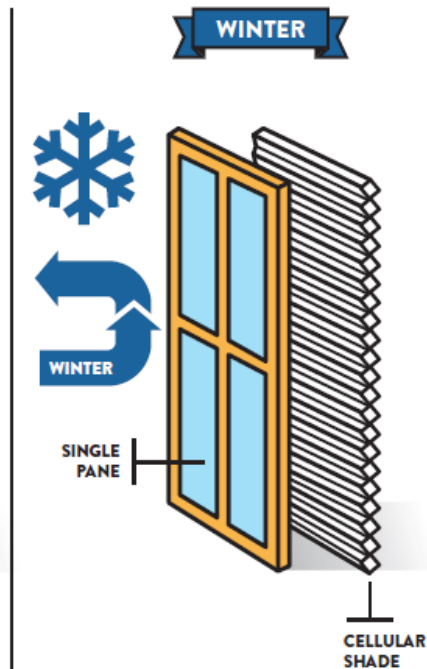
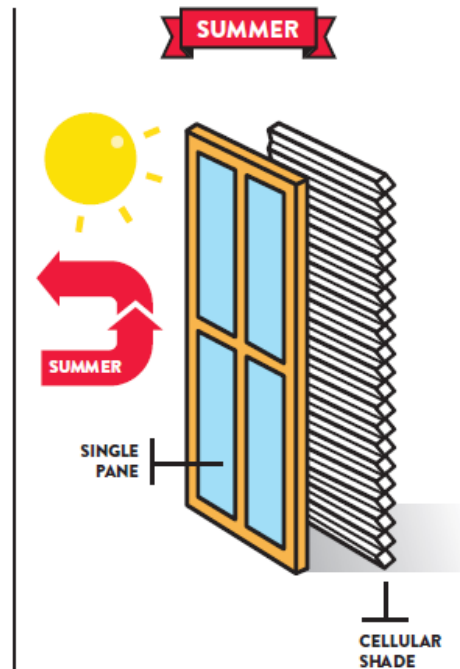
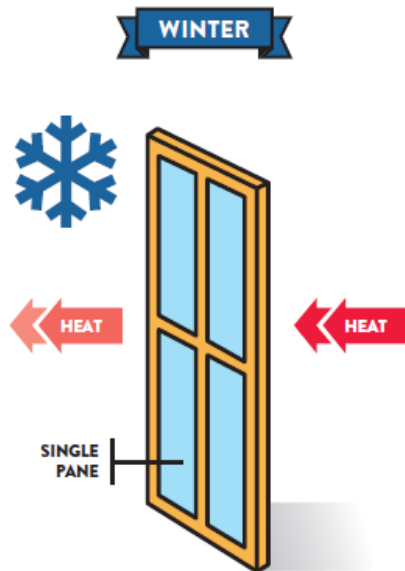
- Lower cost measure



Note: Blinds data includes pricing for vinyl, metal, wood, faux wood, and vertical blinds; pricing ranges include 25th-75th percentile data points for stock and custom products

How do Attachments Save Energy?

- Prevent or block the transfer of heat
 - Can keep homes warmer during winter months and cooler during the summer
- Energy performance can vary based on climate zone, season, and product type



How much energy do attachments save?

- Field demonstrations have shown that window attachments can save significant amounts of energy across product types

Whole Home Energy Savings Range – Experimental Homes: Matched set of homes, 1,500 ft ² , Pacific Northwest			
Product Category	Baseline Window	Percent Savings	
		Heating	Cooling
Cellular Shades (covering all window area)	Double pane clear glass	10.5% ±3.0%- 16.6%±5.3% ⁶	10.4% ±6.5%- 15.9±0.7% ⁷
Exterior Storm Windows (covering all window area)	Double pane clear glass, aluminum frame	10.5%±1.2% ⁹	8.0% ±0.5% ¹⁰
Interior Storm Windows (covering 74% of window area)	Double pane clear glass, aluminum frame	8.2% ±1.9% ¹²	4.2% ±0.7% ¹³

Sources: Petersen J.M., Sullivan, G.P., Cort, K.A., Merzouk, M.B., Weber, J.M. 2015. Evaluation of Interior Low-E Storm Windows in the PNNL Lab Homes. Pacific Northwest National Laboratory on behalf of the U.S. Department of Energy.

13 Cort, K.A., Merzouk, M.B., Peterson, J.M., Sullivan, G.P., and Weber, J.M. 2015. Evaluation of Cellular Shades in the PNNL Lab Homes. Pacific Northwest National Laboratory on behalf of the U.S. Department of Energy (Rev 2 forthcoming, October 2016).

How can consumers optimize energy performance?

- DOE conducted a behavioral study that showed that **consumers can save energy without adjusting their daily routine**
 - Results showed that homes in southern climates had their attachments closed more frequently during summer than northern climates
 - Suggests that consumers may already operate attachments in manner than optimizes efficiency
- Further energy savings can be achieved through automation and additional consumer education

Identifying Efficient Products

- Current Problem: Consumers lack a credible and consistent way to compare energy performance of different window attachment products

- **Solution: AERC Certification Program and Label**

- AERC developing program to certify, rate, and label window attachment products
- Will provide accurate and credible information on the energy performance of window attachment products
- Energy performance information will be publicly available through a Certified Products Database and Website



AERC Certification Program

- Key Elements:



AERC Certification Program

- Program Roles and Responsibilities

Manufacturer

- Submits products for AERC certification
- Labels AERC-certified products

Administrator

- Manages certification program
- Final responsibility for certifying products

Calculation and Simulation Entity

- Simulates attachment product performance

Independent Validator

- Validates that product performance simulations are performed accurately

Independent Inspection Agency

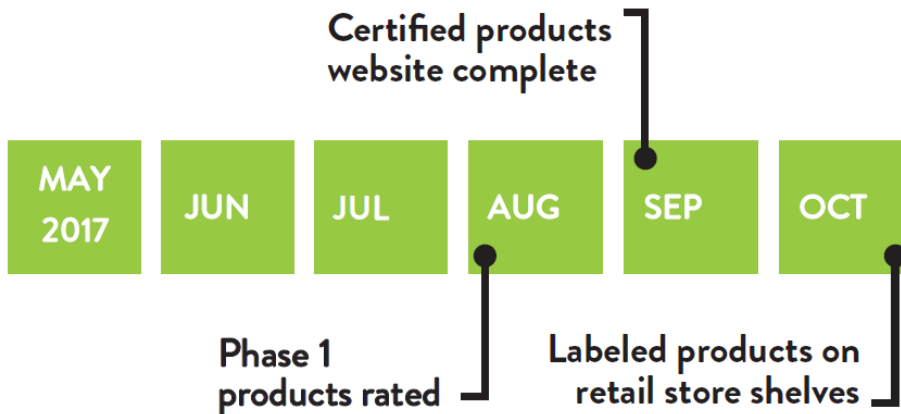
- Provides inspection services for manufacturers and simulators to ensure compliance with AERC program requirements

AERC Certification Program

- Product Rating Development Schedule



- Program Roll-Out



AERC 2017 Goals

- Technical Ratings – Spring 2017
 - Annual Energy Performance, U-factor, SHGC, Visual Transmittance, Air Leakage
- Certified Products Database and Website launch – Summer 2017
- Certify Products – Summer-Fall 2017
- Label in stores — Fall 2017
- Public Education – On-going

AERC Certified Products Website (DRAFT)

AERC ENERGY RATING

PRODUCT SEARCH ENERGY EFFICIENCY WINDOW ATTACHMENTS GUIDE RESOURCES CONTACT

Certified Product Search

Search by Product, Model Number, AERC Number

Product Categories

Click to select one or more options

- Cellular Shades
- Blinds
- Roller Shades
- Storm Windows
- Solar Screens
- Pleated Shades

SEARCH

Understand the Rating Label

19 HEATING CLIMATE
25 COOLING CLIMATE

Higher Performance

LEARN MORE

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AERC ENERGY RATING

PRODUCT SEARCH ENERGY EFFICIENCY WINDOW ATTACHMENTS GUIDE RESOURCES CONTACT

Certified Product Search

Search by Product, Model Number, AERC Number

Refine Search

Clear Filter

Product Category:

- Cellular Shades
- Blinds
- Roller Shades
- Storm Windows
- Solar Screens
- Pleated Shades
- See All

Position:

- Interior
- Exterior

AEP Heating or Cooling Range:

Heating

Cooling

Heating Climate: 20 80

Cooling Climate: 20 80

U-Factor: .02 .8

SHGC: .02 .8

VT: .02 .8

AL: Advanced: .02 .8

Show Less

Search Results

1-20 of 120 products Sort by Product A to Z

Blinds

Product Name
Manufacturer: Name
Product Line: Name
AERC Number: 000000
Position (Interior/Exterior): Interior
Model #: 000000
Date Certified: 00/00/0000
[Show more](#)

AEP Heating Climate: 50

AEP Cooling Climate: 50

Pleated Shades

Product Name
Manufacturer: Name
Product Line: Name
AERC Number: 000000
Position (Interior/Exterior): Interior
Model #: 000000
Date Certified: 00/00/0000
Product Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip. labore et dolore labore et dolore.
Manufacturer Website: www.website.com
[Show Less](#)

AEP Heating Climate: 50

AEP Cooling Climate: 50

U-Factor: .5

SHGC: .5

VT: .5

AL: Advanced: .5

Cellular Shades

Product Name
Manufacturer: Name
Product Line: Name
AERC Number: 000000
Position (Interior/Exterior): Interior
Model #: 000000
Date Certified: 00/00/0000
[Show more](#)

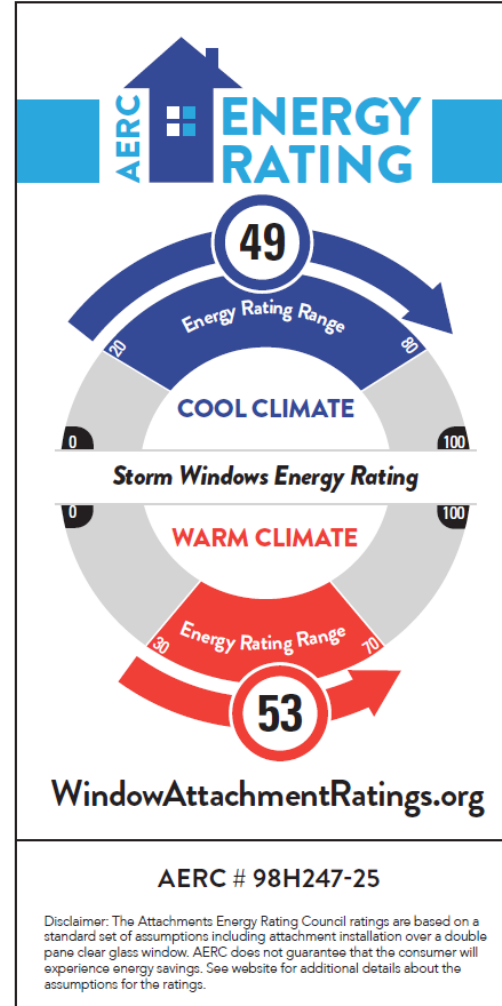
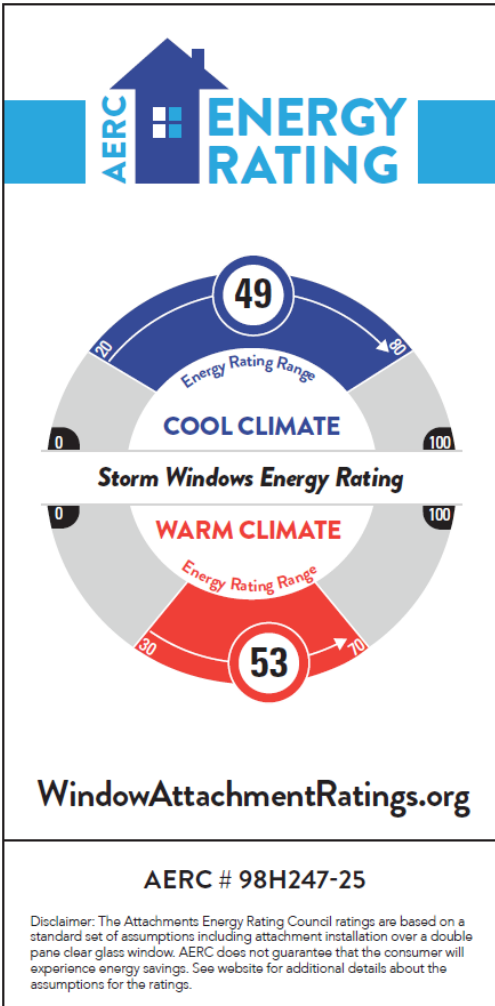
AEP Heating Climate: 50

AEP Cooling Climate: 50

1 2 3 4 5 →

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AERC Residential Product Label (DRAFT)



Future Opportunities

- Pilot Programs
 - Low-E storm windows added as measure to Northwest Regional Technical Forum
 - Efficiency Vermont conducted low-e storm windows pilot in 2015
 - Other pilot programs under development
- ENERGY STAR
 - Currently developing specification for low-e storm windows
 - Criteria Analysis slated for release in Spring 2017
- Education and Outreach
 - Targeted outreach to retailers, utilities, and trade associations

Efficiency Vermont Pilot

- Concept
 - Markdown of Low-E glass to clear glass storm windows (20 – 35% price decrease)
 - Lowe's and Home Depot stores in Vermont
 - Included stock and custom storm windows
- Results
 - Storm window sales increased by 37%
 - Low-e storm windows sales increased by 337%
 - 70% of all storm window sales were low-e during the pilot, compared to 22% the previous year



Engagement with DOE

- Significant opportunities for AERC to integrate and leverage existing DOE programs
 - Residential Buildings Integration
 - Building America
 - ENERGY STAR Homes
 - Home Improvement Catalyst
 - Commercial Buildings Integration
 - Demonstration projects through Consortium for Building Energy Innovation (CBEI), Better Buildings
 - Cooperative agreements through Funding Opportunity Announcements (FOAs)

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Visit us: aercnet.org