



**STORM PANEL ANALYSIS
COMPUTER SIMULATION REPORT**

**Rendered to:
ACOUSTICAL SURFACES, INC.**

**SERIES/MODEL:
Climate Seal Window Insert**

Report Number: 96009.01-116-45
Report Date: 11/24/09
Expiration Date: 11/24/13

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Architectural Testing

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COMPUTER SIMULATION REPORT**

Rendered to:
ACOUSTICAL SURFACES, INC.
123 Columbia Court North
Chaska, Minnesota 55318

Report Number: 96009.01-116-45
Simulation Date: 11/24/09
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Project Summary:

Architectural Testing, Inc. was contracted to perform U-Factor computer simulations to determine qualification for the 2009 Federal Tax Credits for Energy Efficiency. The products were evaluated using the simulation software and general techniques used in determining National Fenestration Rating Council (NFRC) ratings for Windows as a guideline. At present, NFRC does not cover storm panels in its specifications, so the specific techniques used in simulating these products were based on sound engineering judgment. Due to the limitations of the standards, these values cannot be certified to NFRC standards.

Standards:

*The following standards were used as references to perform the necessary calculations. The calculations are NOT in strict compliance with these standards.

NFRC 100-2004: Procedure for Determining Fenestration Product U-Factors

NFRC 200-2004: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance

Software:

Frame and Edge Modeling: THERM 5.2.14
Center-of-Glass Modeling: WINDOW 5.2.17
Total Product Calculations: Microsoft Excel Spreadsheet

Simulations Specimen Description:

Series/Model: Climate Seal Window Insert
Type: Storm Panel
Frame Material: Vinyl Extrusion
Standard Size: 1200mm x 1500mm Fixed Window

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Climate Seal Window Insert

Background:

The American Recovery and Reinvestment Tax Act of 2009 (ARRTA), specifies the availability of tax credits for qualified energy efficiency improvements, including storm windows and doors. IRS Notice 2009-53 clarifies the requirements for eligible storm windows

"A storm window (door) that, in combination with the exterior window (door) over which it is installed - (a) Has a U factor and SHGC of 0.30 or below; and (b) Meets the prescriptive criteria for such component established by the (2001, 2004, or 2009) IECC."

**Architectural Testing makes no statement (implied or otherwise) as to the product's qualification for this tax credit.*

Results:

The storm panel performance was modeled using a series of baseline windows with a variety of glass types. A total of sixteen (16) baseline windows were analyzed.

Base Window Construction

- Wood, Fixed Window
- Vinyl, Fixed Window
- Aluminum Clad Wood, Fixed Window
- Aluminum, Fixed Window

Glass Types

- Single Glazed, Clear Glass
- Double Glazed, Clear Glass
- Double Glazed, Hardcoat Low-e Glass, Air Filled
- Double Glazed, Hardcoat Low-e Glass, Argon Filled

Results:

Base Window Only

	Wood		Vinyl		Aluminum Clad Wood		Aluminum	
	U	SHGC	U	SHGC	U	SHGC	U	SHGC
Single Glazed, Clear Glass	0.89	0.70	0.92	0.72	0.90	0.70	1.10	0.71
Double Glazed, Clear Glass	0.45	0.62	0.48	0.63	0.46	0.62	0.61	0.63
Double Glazed, Low-e Glass	0.35	0.54	0.38	0.55	0.36	0.54	0.56	0.55
Double Glazed, Low-e Glass, Argon	0.32	0.54	0.35	0.55	0.33	0.54	0.53	0.55

Base Window w/ Climate Seal Window Insert

	Wood		Vinyl		Aluminum Clad Wood		Aluminum	
	U-Factor							
	Max	Min	Max	Min	Max	Min	Max	Min
Single Glazed, Clear Glass	0.45	0.42	0.46	0.43	0.47	0.44	0.56	0.52
Double Glazed, Clear Glass	0.30	0.29	0.31	0.30	0.31	0.30	0.41	0.39
Double Glazed, Low-e Glass	0.24	0.24	0.26	0.25	0.25	0.25	0.36	0.34
Double Glazed, Low-e Glass, Argon	0.23	0.22	0.24	0.23	0.24	0.23	0.35	0.32
	SHGC							
	Max	Min	Max	Min	Max	Min	Max	Min
Single Glazed, Clear Glass	0.65	0.63	0.66	0.64	0.65	0.63	0.68	0.65
Double Glazed, Clear Glass	0.58	0.56	0.59	0.57	0.58	0.56	0.61	0.58
Double Glazed, Low-e Glass	0.53	0.52	0.54	0.53	0.53	0.52	0.55	0.54
Double Glazed, Low-e Glass, Argon	0.53	0.51	0.54	0.52	0.53	0.52	0.55	0.54

The ranges noted above cover 3-Sided Frames with Sill Trim and 4-Sided Installations.

The ranges also cover a variety of glazing thicknesses and types.

- Plaskolite 0.060", 0.125", 0.177", 0.236" Thickness
- Acrylite AR 0.118", 0.177", 0.236" Thickness
- Acrylite FF 0.118", 0.177", 0.236" Thickness
- Acrylite OP-3 0.118", 0.177", 0.236" Thickness

Summary:

Climate Seal Window Insert

Window Construction	Wood	Vinyl	Aluminum Clad Wood	Aluminum
Glass Type	0.30 / 0.30 or Better			
Single Glazed, Clear Glass	No	No	No	No
Double Glazed, Clear Glass	No	No	No	No
Double Glazed, Hardcoat Low-e Glass, Air Filled	No	No	No	No
Double Glazed, Hardcoat Low-e Glass, Argon Filled	No	No	No	No

Detailed drawings, simulation data files, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire. Results obtained are simulated values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the product simulated. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

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MJT:MJT
96009.01-116-45

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A: Drawings and Bills of Material (5)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
.01R0	11/24/2009	All	Original Report Issue