Architectural Testing

NFRC 201-2004 SOLAR HEAT GAIN COEFFICIENT TEST REPORT

Rendered to:

CLEAR FOCUS IMAGING

SERIES/MODEL: ClassicVue®
BASE WINDOW: 3/16" Clear Single Glazed
PRODUCT TYPE: Window Film on the Exterior of Clear 3/16" Glass

Summary of Results	
Solar Heat Gain Coefficient (SHGC) - Base Window	0.84
Solar Heat Gain Coefficient (SHGC) - Base with Attachment	0.42
Percent Reduction of Heat Transfer	50%
Daylight Opening	36" x 48" (914 mm x 1219 mm)
Layer 1	3/16" Clear Glass
Attachment	ClassicVue® exterior-mount, pressure-sensitive film with a 50/50 perforation pattern and 0.06 in. (1.5mm) holes

Reference should be made to ATI Report No. 99451.02-301-41 for complete test specimen description and data.

2524 E. Jensen Ave
Fresno, CA 93706
phone: 559-233-8705
fax: 559-233-8360
www.archtest.com

Architectural Testing

NFRC 201-2004 SOLAR HEAT GAIN COEFFICIENT TEST REPORT

Rendered to:

CLEAR FOCUS IMAGING
60 Maxwell Court
Santa Rosa, California 95401

Report No:	99451.02-301-41
Test Date:	03/23/10
Report Date:	04/14/10
Revision 1 Date:	04/30/10
Record Retention Date:	03/23/14

Test Sample Identification:

Series/Model: ClassicVue®

Base Window: 3/16" Clear Single Glazed

Type: Fixed

Overall Size: 37" x 49" (940 mm x 1245 mm)
Daylight Opening Size: 36" x 48" (914 mm x 1219 mm)

Test Sample Submitted by: Client

Test Procedure: Solar heat gain testing in accordance with NFRC 201-2004, *Interim Standard Test Method for Measuring the Solar Heat Gain Coefficient of Fenestration Systems Using Calorimetry Hot Box Methods* .

Test Results Summary:

Solar Heat Gain Coefficient (SHGC) - Base Window	0.84
Solar Heat Gain Coefficient (SHGC) - Base with Attachement	0.42
Percent Reduction Heat Gain	50%

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Test Sample Description:

Glazing Information:

Layer 1	3/16" Clear Glass
Attachement	ClassicVue® exterior-mount, pressure-sensitive film with a 50/50 perforation pattern and 0.06 in. (1.5mm) holes

48" Calorimeter Calibration Information

1.	Moving Pyranometer Last Calibration	02/16/10
2	Flowmeter Last Calibration	01/28/10
3	Thermocouple Last Calibration	02/08/10
4	Surround Panel Conductivity Last Calibration	12/02/09
5	Power Input Last Calibration	02/08/10
6	Fluid Temperature Difference Last Calibration	02/08/10
7	Miscellaneous Power Input Last Calibration	02/08/10
8	Metering Box Last Calibration	03/15/10
9.	Calibration Transfer Standard	03/05/10

Solar Heat Gain Coefficient (SHGC)

Test Data:

1.	Starting Azimuth	152	Degrees
2.	Ending Azimuth	170	Degrees
3.	Minimum Altitude	54	Degrees
4.	Maximum Altitude	51	Degrees
5.	Average Barometric Pressure	29.5	Inches of mercury
6.	Maximum Wind Velocity	5	MPH
7.	Minimum Wind Velocity	2	MPH
8.	Average Wind Velocity	4	MPH
9.	Average Wind Direction (North equals 360 degrees)	131	Degrees
10.	Maximum Exterior Surface Coefficient ($H_{h\text{-}sun}$)	6.9	Btu/hr·ft²·F
11.	Minimum Exterior Surface Coefficient ($H_{h\text{-}sun}$)	6.4	Btu/hr·ft²·F
12.	Average Exterior Surface Coefficient ($H_{h\text{-}sun}$)	6.6	Btu/hr·ft²·F
13.	Average Exterior Air Temperature (t_h)	65.0	F
14.	Standardized Weather Conductance (h_{stII})	5.10	Btu/hr·ft²·F
15.	Thermal Transmittance (U_s)*	1.030	Btu/hr·ft²·F
16.	Maximum Solar Irradiation E_s	331.3	Btu/hr·ft^2
17.	Minimum Solar Irradiation E_s	328.8	Btu/hr·ft^2
18.	Average Solar Irradiation E_s	330.1	Btu/hr·ft^2
19.	Inlet Fluid Temperature	66.1	F
20.	Outlet Fluid Temperature	67.6	F
21.	Test Start Time	10:40	HHMM
22.	Test End Time	11:30	HHMM

*Simulated by Window 5

Solar Heat Gain Coefficient (SHGC)

Test Data: (Continued)

Temperatures during maximum irradiation
Air and heat exchanger temperatures
*Note: See Appendix A for locations

Air Top	1	Heat Exchanger	73.5 F
Air Center	2	Heat Exchanger	72.8 F
Air Bottom	3	Heat Exchanger	74.1 F
Location	4	Heat Exchanger	69.0 F
Location	5	Heat Exchanger	68.7 F
Location	6	Heat Exchanger	68.6 F
Location	7	Heat Exchanger	69.1 F
Location	8	Heat Exchanger	68.1 F
Location	9	Heat Exchanger	68.1 F
Location	10	Heat Exchanger	68.0 F
Location	11	Heat Exchanger	68.0 F
Location	12	Heat Exchanger	68.0 F
Location	13	Heat Exchanger	68.1 F
Location	14	Heat Exchanger	68.1 F
Location	15	Heat Exchanger	68.0 F
Location	16	Heat Exchanger	68.3 F
Location	17	Heat Exchanger	72.3 F
Location	18	Heat Exchanger	68.3 F
Location	19	Heat Exchanger	0.0 F
Location	20	Heat Exchanger	73.5 F
Location	21	Heat Exchanger	69.5 F
Location	22	Heat Exchanger	68.7 F
Location	23	Heat Exchanger	67.8 F
Location	24	Heat Exchanger	70.7 F
Location	25	Heat Exchanger	68.3 F
Location	26	Heat Exchanger	68.3 F
Location	27	Heat Exchanger	69.6 F
Location	28	Heat Exchanger	70.2 F

Solar Heat Gain Coefficient (SHGC)

Test Data: (Continued)

Data at time of maximum irradiation

1.	Average inside air temperature	73.5	F
2	Maximum thermal transmittance (Q u-factor)	-100.8	Btu/hr
3	Surround panel inside temperature (t_{sp1})	70.5	F
4	Surround panel outside temperature (t_{sp2})	82.5	F
5	Heat flow through surround panel (Q_{sp})	4.7	Btu/hr
6	Flanking Loss (Q_{fl})	2.970	Btu/hr
7	Fluid volumetric flow rate (f)	2.3	Gal/mi
8	Auxiliary energy (Q aux)	43.9	Btu/hr
9	Heat Extracted From System (Q_{fluid})	1661.9	Btu/hr
10	Heat Across Walls (Q_{walls})	57.3	Btu/hr
11	Heat Flow Through Test Specimen (Q_s)	1653.8	Btu/hr

The specimen was installed into an extruded polystyrene foam panel with an R-value of 17 using silicone caulking. Tracking system azimuth and altitude are read every minute and the calorimeter is moved to a position normal to the sun from chart stored in computer. The calorimeter is located at 2524 East Jensen in Fresno, California near the southwest corner of the lot elevated approximately 15 feet from ground level. The foreground is desert, the background is industrial buildings.

The estimated uncertainty of this test 2.67%

This was determined using ANSI/NCSL Z540-2-1997 type B evaluation as described in section 4.3 of this specification. For assumptions used for this calculation or for a description of the procedure contact the "Individual-In-Responsible-Charge" that signed this report.

"This test method does not include separate procedures to determine the heat flows due to either air movement or nighttime U-factor effects. As a consequence, the SHGC results obtained do not reflect the overall performance which may be found in field installations due to temperature differences, wind, shading, air leakage effects, and the thermal bridge effects specific to the design and construction of the fenestration system opening."

"Since there is a wide variety of fenestration system openings in residential, commercial and industrial buildings, it is not feasible to select a "typical" surround panel construction in which to mount the fenestration test specimen. The selection of a relatively high thermal resistance surround panel places the focus of the test on the thermal performance system alone. Therefore, it should be recognized that the thermal transmittance results obtained from this test method, for ideal laboratory conditions in a highly insulating surround panel, should only be used for fenestration product comparisons or as input to thermal performance analyses which also include thermal, air leakage and thermal bridge effects due to the surrounding building structure. To determine air leakage effects for windows and doors, refer to Test Method ASTM E 283. For thermal transmittance refer to Test Method ASTM C 1199."

Ratings included in this report are for submittal to an NFRC-licensed IA for certification purposes and are not meant to be used for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) are to be used for labeling purposes.

Detailed drawings, representative samples of the test specimen and a copy of this report will be retained by Architectural Testing for a period of four years. This report is the exclusive property of the client so named herein and relates only to the fenestration product tested. This report may not be reproduced, except in full, without the approval of the laboratory.

For ARCHITECTURAL TESTING, INC.

Tyler Westerling /m.s.
Digitally Signed for: Tyler Westerling by Marisela Saavedra

Tyler Westerling, P.E.
Project Engineer
Individual-In-Responsible-Charge

Leaton Kirk /m.s.
Digitally Signed for: Leaton Kirk by Marisela Saavedra

Leaton Kirk
Director - Regional Operations

TW:he

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Thermocouple Location (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	04/14/10	All	Original Report Issue. Work requested by Judy Bellah of Clear Focus Imaging
1	4/30/2010	Title, 1, 2	Added registered trademark symbol to series/model
1	4/30/2010	Title	Corrected a typo

Appendix A

Thermocouple Locations

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Absorber Plate Thermocouple Layout