Architectural Testing

ASTM C 1363-2011 THERMAL PERFORMANCE TEST REPORT

Rendered to:

GALLINA USA, LLC

SERIES/MODEL: ArcoPlus 547 - Opal

TYPE: Multi-Cell Panel

Summary of Results	
Standardized Thermal Transmittance (U-Factor)	0.28
Unit Size:	39-1/2" x 39-1/2"

Reference must be made to Report No. C1826.01-301-46, dated 08/21/12 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

ASTM C 1363-2011 THERMAL PERFORMANCE TEST REPORT

Rendered to:

GALLINA USA, LLC
4335 Capital Circle
Janesville, Wisconsin 53546

Report Number:	C1826.01-301-46
Test Date:	08/16/12
Report Date:	08/21/12
Test Record Retention Date:	08/16/16

Test Sample Identification:

Series/Model: ArcoPlus 547 - Opal

Type: Multi-Cell Panel

Overall Size: 39-1/2" x 39-1/2"

Test Sample Submitted by: Client

Test Procedure: The thermal transmittance (U) was determined in general accordance with ASTM C 1363-2011, *Standard Test Method for the Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.*

Test Results Summary:

Thermal Transmittance (U): 0.28 Btu/hr·ft^2·F

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

Test Sample Description:

Overall Size: 39-1/2" x 39-1/2"

Construction:*

The unit consisted of three vertically-oriented multi-cellulor extruded panels, snap fit together.

Glazing Deflection:

	N/A
Edge Gap Width	N/A
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	N/A
Center gap width at laboratory ambient conditions on day of testing	N/A
Center gap width at test conditions	N/A

**See Appendix A for Cross-Sectional Picture*
N/A Non-Applicable

Measured Test Data

Areas

1. Test Specimen Projected Area (A_s)	10.84	ft^2
2. Metering Box Opening Area (A_{mb})	36.47	ft^2
3. Metering Box Baffle Area (A_{b1})	32.13	ft^2
4. Surround Panel Interior Exposed Area (A_{sp})	25.63	ft^2

Heat Flows

1. Total Measured Input into Metering Box (Q_{total})	325.61	Btu/hr
2. Surround Panel Heat Flow (Q_{sp})	76.54	Btu/hr
3. Surround Panel Thickness	4.00	inches
4. Surround Panel Conductance	0.0450	$Btu/hr \cdot ft^2 \cdot F$
5. Metering Box Wall Heat Flow (Q_{mb})	11.59	Btu/hr
6. EMF vs Heat Flow Equation (equivalent information)	0.0235*EMF + -1.226	
7. Flanking Loss Heat Flow (Q_{fl})	25.21	Btu/hr
8. Net Specimen Heat Loss (Q_s)	212.27	Btu/hr

The sample was inspected for the formation of frost or condensation, which may influence the surface temperature measurements. The sample showed no evidence of condensation/frost at the conclusion of the test.

The test sample was installed in a vertical orientation, the exterior of the specimen was exposed to the cold side. The direction of heat transfer was from the interior (warm side) to the exterior (cold side) of the specimen.

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 4.24%.

Required annual calibrations for the Architectural Testing Inc. 'thermal test chamber' (ICN 004287) in Fresno, California were last conducted in May 2011 in accordance with Architectural Testing Inc. calibration procedure. A CTS Calibration verification was performed April 2012.

Thermal Transmittance (U-factor)

Test Conditions

1. Average Metering Room Air Temperature (t_h)	69.83	F
2. Average Cold Side Air Temperature (t_c)	-0.49	F
3. Average Guard/Environmental Air Temperature	72.00	F
4. Metering Room Average Relative Humidity	14.01	%
5. Metering Room Maximum Relative Humidity	14.66	%
6. Metering Room Minimum Relative Humidity	13.39	%
7. Measured Cold Side Wind Velocity (Perpendicular Flow)	15.09	mph
8. Measured Warm Side Wind Velocity (Parallel Flow)	0.04	mph
9. Measured Static Pressure Difference Across Test Specimen	0.00" ± 0.04"	H_2O

Results

1. Thermal Conductance	0.37	Btu/hr·ft²·F
2. Thermal Resistance	2.74	hr·ft²·F/Btu
3. Overall Thermal Resistance (R_u)	3.59	hr·ft²·F/Btu
4. Warm Side Surface Resistance (R_h)	0.68	hr·ft²·F/Btu
5. Cold Side Surface Resistance (R_c)	0.18	hr·ft²·F/Btu
6. Warm Side Surface Conductance (h_h)	1.48	Btu/hr·ft²·F
7. Cold Side Surface Conductance (h_c)	5.67	Btu/hr·ft²·F
8. Thermal Transmittance of Test Specimen (U)	0.28	Btu/hr·ft²·F

Test Duration

1. The environmental systems were started at 13:16 hours, 08/15/12.
2. The test parameters were considered stable for two consecutive four hour test periods from 22:58 hours, 08/15/12 to 06:58 hours, 08/16/12.
3. The thermal performance test results were derived from 02:58 hours, 08/16/12 to 06:58 hours, 08/16/12.

Surface Temperatures

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Individual Surface Temperature Measurements

Thermocouple	Warm Side (F)	Cold Side (F)	Thermocouple	Warm Side (F)	Cold Side (F)
1	58.62	3.47	9	56.79	2.21
2	59.08	3.99	10	57.05	2.70
3	58.71	3.41	11	57.16	2.84
4	58.39	3.55	12	56.76	2.58
5	57.58	3.29	13	51.51	1.83
6	57.96	3.78	14	51.70	1.71
7	57.71	3.50	15	54.66	2.81
8	59.36	3.34	16	52.60	2.45

1. Average Warm Side Surface Temperature 56.60 F
2. Average Cold Side Surface Temperature 2.97 F

Detailed drawings, data sheets, representative samples of test specimens, 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 by Architectural Testing will expire. Results obtained are tested 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 specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Tested By:

William Simon Smeds
Technician

Reviewed By:

Kenny C. White
Laboratory Manager
Individual-In-Responsible-Charge

WSS:ss
C1826.01-301-46

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Photographs (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	08/21/12	All	Original Report Issue. Work requested by Mr. Daniel Hale of Gallina USA, LLC

Appendix A: Photographs