

CR LAURENCE CO., INC.

THERMAL PERFORMANCE TEST REPORT

SCOPE OF WORK

PALISADES S90 BI-FOLDING DOORS WITH FRAME (DOUBLE)

REPORT NUMBER

L4173.01-301-46 R1

TEST DATE

10/27/20

ISSUE DATE

01/27/21

REVISED DATE

02/02/21

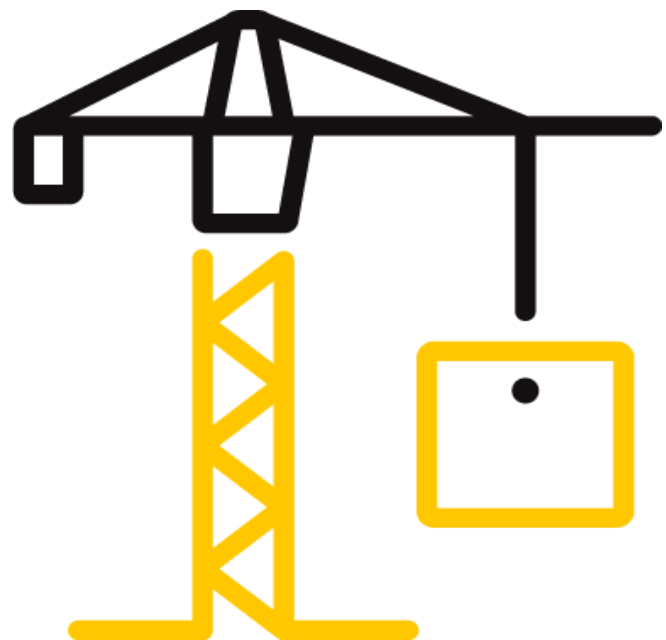
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DOCUMENT CONTROL NUMBER

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Report No.: L4173.01-301-46 R1
Date: 02/02/21

REPORT ISSUED TO

CR LAURENCE CO., INC.
2100 East 38th Street
Vernon, California 90058

SECTION 1

SCOPE

SERIES/MODEL: Palisades S90
TYPE: Bi-Folding Doors with Frame (Double)

Intertek Building & Construction (Intertek B&C) was contracted by CR Laurence Co., Inc. to evaluate the thermal performance per NFRC 102-2020. Results obtained are tested values and were secured by using the designated test method. Testing was conducted at Intertek B&C test facility in Fresno, California.

Intertek B&C will service this report for the entire test record retention period. The test record retention period ends five years after the test date. Test records, such as detailed drawings, datasheets, or other pertinent project documentation, will be retained for the entire test record retention period. Representative samples of the test specimen will be retained by Intertek B&C for a minimum of two and a half years from the submittal date to the Inspection Agency and no more than five years from the test date.

For INTERTEK B&C:

COMPLETED BY	William Simon Smeds
TITLE	Technician
SIGNATURE	
DATE	02/02/21

REVIEWED BY	Kenny C. White
TITLE	Laboratory Manager, IIRC
SIGNATURE	
DATE	02/02/21

WSS:ss

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SECTION 2**SUMMARY OF TEST RESULTS**Standardized U-factor (Ust): 0.37 Btu/hr-ft²·F (CTS Method)**SECTION 3****TEST SPECIMEN SUMMARY**

SERIES/MODEL	Palisades S90 Bi-Folding Doors with Frame (Double)
TYPE	Bi-Folding Doors with Frame (Double)
OVERALL SIZE	75-1/2" x 81-1/2" (1918 mm x 2070 mm) (Model Size)
NFRC STANDARD SIZE	75.6" x 82.3" (1920 mm wide x 2090 mm high)
TEST SAMPLE SUBMITTED BY	Client
TEST SAMPLE SUBMITTED FOR	Validation for Initial Certification (Production Line Unit) & Plant Qualification

SECTION 4**TEST METHOD**

The specimens were evaluated in accordance with the following:

NFRC 102-2020, Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems

SECTION 5**MATERIAL SOURCE/INSTALLATION**

The test specimen was provided by the client.

The test sample was installed in a vertical orientation, the exterior of the specimen was exposed to the cold side.

SECTION 6**LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
William Simon Smeds	Intertek B&C

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SECTION 7

TEST SAMPLE DESCRIPTION

Frame

MATERIAL	AT (0.98"): Aluminum with Thermal Breaks - All Members		
SIZE	75-1/2" x 81-1/2" (Model Size)		
DAYLIGHT OPENING	N/A	GLAZING METHOD	N/A
EXTERIOR COLOR	Black	EXTERIOR FINISH	Anodized
INTERIOR COLOR	Black	INTERIOR FINISH	Anodized
CORNER JOINERY	Square Cut / Screws / Sealed		

Primary Panel

MATERIAL	AT (0.98"): Aluminum with Thermal Breaks - All Members		
SIZE	33-5/8" x 79-1/4"		
DAYLIGHT OPENING	31-1/4" x 76"	GLAZING METHOD	Interior
EXTERIOR COLOR	Black	EXTERIOR FINISH	Anodized
INTERIOR COLOR	Black	INTERIOR FINISH	Anodized
CORNER JOINERY	Mitered / Corner Keys / Sealed		

Secondary Panel

MATERIAL	AT (0.98"): Aluminum with Thermal Breaks - All Members		
SIZE	33-5/8" x 79-1/4"		
DAYLIGHT OPENING	31-1/4" x 76"	GLAZING METHOD	Interior
EXTERIOR COLOR	Black	EXTERIOR FINISH	Anodized
INTERIOR COLOR	Black	INTERIOR FINISH	Anodized
CORNER JOINERY	Mitered / Corner Keys / Sealed		

Glazing Information

LAYER 1	3/16"	PPG Solarban 70XL (e=0.018*, #2)	
GAP	0.63"	A1-D: Aluminum Spacer	90% Argon*
LAYER 2	3/16"	Clear	
GAS FILL METHOD	Single-Probe Method*		

**Stated per Client/Manufacturer*

N/A Non-Applicable

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SECTION 7 (CONTINUED)

TEST SAMPLE DESCRIPTION (CONTINUED)

Weatherstripping

DESCRIPTION	QUANTITY	LOCATION
1/8" Felt covered hollow bulb gasket with 1/8" leaf	1 Row	Perimeter of frame.
3/4" Rubber post gasket with 3/8" leaf	1 Row	Jambs.
3/4" Rubber post gasket with 3/8" leaf	2 Rows	Posts.
3/8" Hollow bulb	1 Row	Top and bottom rail of exterior panels.
0.187" x 0.310" Polypile gasket	1 Row	Head.
1/8" Hollow foam gasket	2 Rows	Stiles.
1/8" Hollow foam gasket	2 Rows	Even supplement (post).
1/8" Hollow foam gasket	1 Row	Interior side of each rail.

Hardware

DESCRIPTION	QUANTITY	LOCATION
Latch lock with pin	1	Lateral hinge jamb.
Hinge	20	Jambs, posts, panels.

Drainage

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weep slot	1-3/4" x 1/4"	4	Sill.

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THERMAL TRANSMITTANCE (U-FACTOR): MEASURED TEST DATA

Heat Flows

1. Total Measured Input into Metering Box (Qtotal)	1317.29 Btu/hr
2. Surround Panel Heat Flow (Qsp)	82.38 Btu/hr
3. Surround Panel Thickness	4.00 inches
4. Surround Panel Conductance	0.0463 Btu/hr·ft ² ·F
5. Metering Box Wall Heat Flow (Qmb)	27.97 Btu/hr
6. EMF vs Heat Flow Equation (equivalent information)	0.0207*EMF + 0.000
7. Flanking Loss Heat Flow (Qfl)	36.94 Btu/hr
8. Net Specimen Heat Loss (Qs)	1170.00 Btu/hr

Areas

1. Test Specimen Projected Area (As)	42.73 ft ²
2. Test Specimen Projected Frame Area (Af)	9.74 ft ²
3. Test Specimen Projected Glazing Area (Ag)	32.99 ft ²
4. Metering Box Opening Area (Amb)	69.44 ft ²
5. Metering Box Baffle Area (Ab1)	60.56 ft ²
6. Surround Panel Interior Exposed Area (Asp)	26.71 ft ²

Test Conditions

1. Average Metering Room Air Temperature (th)	69.79 F
2. Average Cold Side Air Temperature (tc)	-0.50 F
3. Average Guard/Environmental Air Temperature	73.99 F
4. Metering Room Average Relative Humidity	8.87 %
5. Metering Room Maximum Relative Humidity	9.00 %
6. Metering Room Minimum Relative Humidity	8.76 %
7. Measured Cold Side Wind Velocity (Perpendicular Flow)	11.22 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 ₂ O

Average Surface Temperatures

1. Metering Room Surround Panel	66.29 F
2. Cold Side Surround Panel	-0.33 F

Results

1. Thermal Transmittance of Test Specimen (Us)	0.39 Btu/hr·ft ² ·F
2. Standardized Thermal Transmittance of Test Specimen (Ust)	0.37 Btu/hr·ft ² ·F

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THERMAL TRANSMITTANCE (U-FACTOR): CALCULATED TEST DATA

CTS Method Results

1. Warm Side Surface Emittance of CTS (e1)	0.84
2. Warm Side Area-Weighted Surface Emittance of Specimen Frame (ef1)	0.80
3. Warm Side Area-Weighted Surface Emittance of Specimen Glazing (eg1)	0.84
4. Warm Side Surface Emittance of Surround Panel (esp1)	0.90
5. Warm Side Area-Weighted Surface Emittance in View of the Baffle (es1)	0.85
6. Warm Side Baffle Emittance (eb1)	0.92
7. Cold Side Baffle Emittance (eb2)	N/A
8. Equivalent Warm Side Surface Temperature (t1)	51.20 F
9. Equivalent Cold Side Surface Temperature (t2)	4.79 F
10. Warm Side Baffle Surface Temperature	69.64 F
11. Cold Side Baffle Surface Temperature	N/A F
12. Measured Warm Side Surface Conductance (hh)	1.47 Btu/hr·ft ² ·F
13. Measured Cold Side Surface Conductance (hc)	5.18 Btu/hr·ft ² ·F
14. Test Specimen Thermal Conductance (Cs)	0.59 Btu/hr·ft ² ·F
15. Convection Coefficient (Kc)	0.34 Btu/(hr·ft ² ·F ^{1.25})
16. Radiative Test Specimen Heat Flow (Qr1)	603.50 Btu/hr
17. Conductive Test Specimen Heat Flow (Qc1)	566.51 Btu/hr
18. Radiative Heat Flux of Test Specimen (qr1)	14.12 Btu/hr·ft ² ·F
19. Convective Heat Flux of Test Specimen (qc1)	13.26 Btu/hr·ft ² ·F
20. Standardized Warm Side Surface Conductance (hsth)	1.21 Btu/hr·ft ² ·F
21. Standardized Cold Side Surface Conductance (hstc)	5.28 Btu/hr·ft ² ·F
22. Standardized Thermal Transmittance (Ust)	0.37 Btu/hr·ft ² ·F

SECTION 10

TEST DURATION

1. The environmental systems were started at 12:16 hours, 10/26/20.
2. The test parameters were considered stable for two consecutive four hour test periods from 23:20 hours, 10/26/20 to 07:20 hours, 10/27/20.
3. The thermal performance test results were derived from 03:20 hours, 10/27/20 to 07:20 hours, 10/27/20.

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SECTION 11

GLAZING DEFLECTION

	Left Panel	Right Panel
EDGE GAP WIDTH	0.63"	0.63"
ESTIMATED CENTER GAP WIDTH upon receipt of specimen in laboratory (after stabilization)	0.70"	0.71"
CENTER GAP WIDTH at laboratory ambient conditions on day of testing	0.70"	0.71"
CENTER GAP WIDTH at test conditions	0.58"	0.60"

Glass collapse determined using a digital glass and air space meter

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.

“This test method does not include procedures to determine the heat flow due to either air movement through the specimen or solar radiation effects. As a consequence, the thermal transmittance results obtained do not reflect performances which are expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that have the potential to occur due to the specific design and construction of the fenestration system opening. The latter can only be determined by in-situ measurements. Therefore, it is important to recognize that the thermal transmittance results obtained from this test method are for ideal laboratory conditions and should only be used for fenestration product comparisons and as input to thermal performance analyses which also include solar, air leakage and thermal bridge effects.”

Required annual calibrations for the Intertek B&C, 'thermal test chamber' (ICN 004287) in Fresno, California were last conducted in January 2020 in accordance with Intertek B&C calibration procedure. A CTS Calibration verification was performed July 2020. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed May 2020.

The reported Standardized Thermal Transmittance (Ust) was determined using CTS Method, per Section 9.2(A) of NFRC 102.

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SECTION 12

CTS CALIBRATION DATA

1. CTS Test Date	11/07/19
2. CTS Size	43.06 ft ²
3. CTS Glass/Core Conductance	0.40 Btu/hr·ft ² ·F
4. Warm Side Air Temperature	69.81 F
5. Cold Side Air Temperature	-0.50 F
6. Warm Side Average Surface Temperature	55.11 F
7. Cold Side Average Surface Temperature	3.49 F
8. Convection Coefficient (Kc)	0.34 Btu/(hr·ft ² ·F ^{1.25})
9. Measured Cold Side Surface Conductance (hc)	5.18 Btu/hr·ft ² ·F
10. Measured Thermal Transmittance	0.32 Btu/hr·ft ² ·F

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 1.74%.

"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 options identified on a valid Certificate of Authorization (CA) are to be used for labeling purposes."

The direction of heat transfer was from the interior (warm side) to the exterior (cold side) of the specimen. The ratings were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy. The data acquisition frequency is 5 minutes.

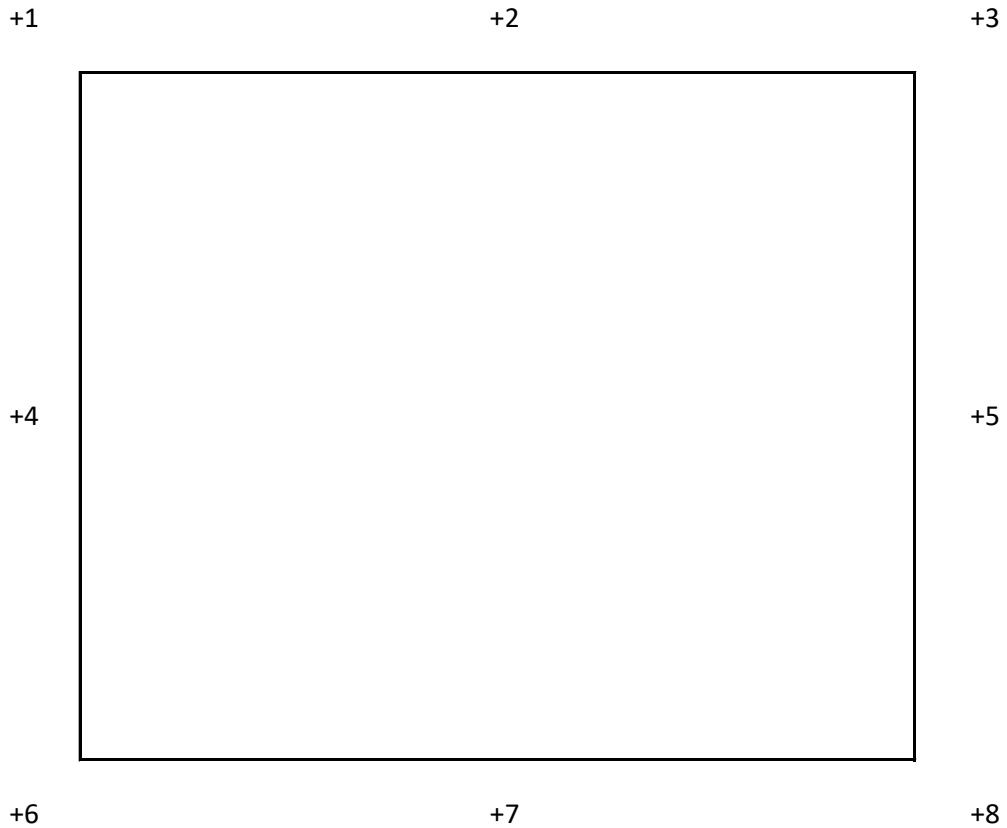
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SECTION 13

SURROUND PANEL WIRING DIAGRAM



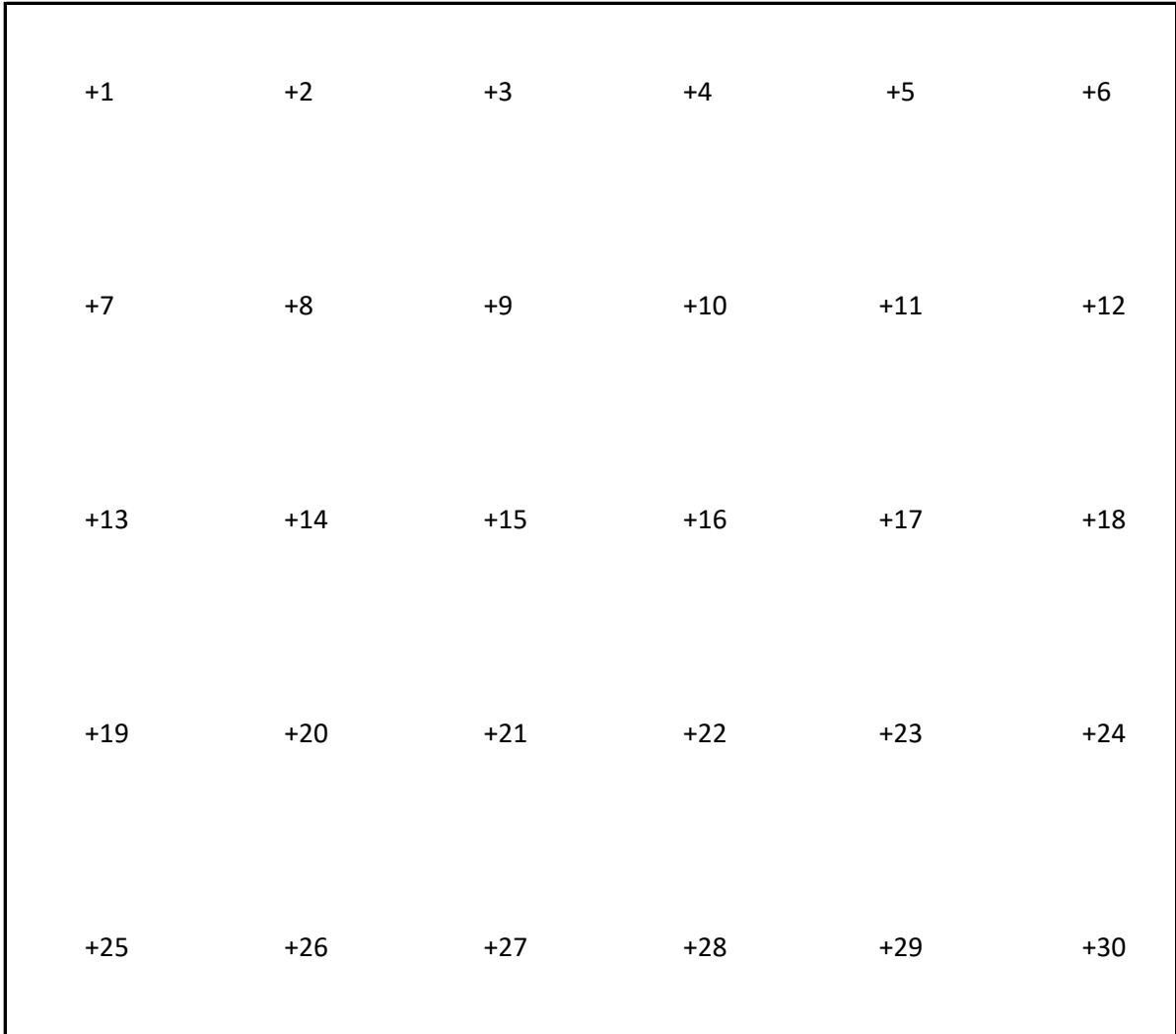
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SECTION 14

BAFFLE WIRING DIAGRAM



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SECTION 15

SUBMITTAL FORM AND DRAWINGS

The test specimen drawings which follow have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

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SECTION 16

REVISION LOG

REVISION #	DATE	PAGES	REVISION
.01 R0	01/27/21	N/A	Original Report Issue
.01 R1	02/02/21	1 - 5	Revised Product Type and Test Sample Description