

**NFRC 102-2014 THERMAL PERFORMANCE
TEST REPORT****Rendered to:****CR LAURENCE CO., INC.****SERIES/MODEL: MS-375TC Thermal Composite Door****TYPE: Swinging Door with Frame**

Summary of Results		
Standardized Thermal Transmittance (U-Factor)	0.38	
Unit Size:	38" x 85" (965 mm x 2159 mm) (Non-Standard Size)	
Layer 1: 1/4"	PPG Solarban z75 (e=0.018*, #2)	
Gap 1: 0.53"	TS-D: Technoform TGI Wave Spacer	90% Argon*
Layer 2: 1/4"	Clear	

Reference must be made to Report No. F4753.04-116-46, dated 08/31/18 for complete test specimen description and data.



NFRC 102-2014 THERMAL PERFORMANCE TEST REPORT

Rendered to:

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

Report Number: F4753.04-116-46
Test Date: 03/09/16
Report Date: 08/31/18

Test Sample Identification:

Series/Model: MS-375TC Thermal Composite Door

Type: Swinging Door with Frame

Overall Size: 38" x 85" (965 mm x 2159 mm) (Non-Standard Size)

NFRC Standard Size: 37.8" x 82.3" (960 mm wide x 2090 mm high)

Test Sample Submitted by: Oldcastle BuildingEnvelope - Terrell, Texas

Test Sample Submitted for: Validation for Initial Certification (Production Line Unit) no Plant Qualification

This report is a reissue of the original Report No. F4753.01-116-46. This report is reissued in the name of CR Laurence Co., Inc. through written authorization of Oldcastle BuildingEnvelope.

Test Procedure: U-Factor tests were performed in a Guarded Hot Box in accordance with NFRC 102-2014, *Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems*.

Test Results Summary:

Standardized U-factor (U_{st}): 0.38 Btu/hr·ft²·F (CTS Method)



Test Sample Description:

Frame:

Material:	AT (0.21"): Aluminum with Thermal Breaks - All Members*		
Size:	38" x 85" (Non-Standard Size)		
Daylight Opening:	N/A	Glazing Method:	N/A
Exterior Color:	Clear	Exterior Finish:	Anodized
Interior Color:	Clear	Interior Finish:	Anodized
Corner Joinery:	Square Cut / Screws / Sealed		

*Sill was AT (0.21"), head and jambs were AT (0.50")

Panel:

Material:	AT (0.25"): Aluminum with Thermal Breaks - All Members*		
Size:	35-3/4" x 83-1/4"		
Daylight Opening:	26-7/8" x 69-3/4"	Glazing Method:	Interior/Exterior
Exterior Color:	Clear	Exterior Finish:	Anodized
Interior Color:	Clear	Interior Finish:	Anodized
Corner Joinery:	Square Cut / Screws / Sealed		

*Stiles were AT (0.25"), top and bottom rail were AT (0.34")

** Interior panel cavities were filled with polyurethane foam

Glazing Information:

Layer 1:	1/4"	PPG Solarban z75 (e=0.018*, #2)	
Gap 1:	0.53"	TS-D: Technoform TGI Wave Spacer	90% Argon*
Layer 2:	1/4"	Clear	
Gas Fill Method:	Single-Probe Method*		

*Stated per Client/Manufacturer

N/A Non-Applicable

Test Sample Description: (Continued)

Weatherstripping:

Description	Quantity	Location
Flexible hollow bulb gasket	1 row	Head and jambs
Single-fin gasket	1 row	Jambs
Single-fin gasket	1 row	Interior and exterior bottom rail sweep
Single-fin gasket	1 row	Top rail
FG-1133 gasket	1 row	Interior and exterior glazing perimeter

Hardware:

Description	Quantity	Location
Lock assembly	1	Lock stile
Aluminum handle	2	Interior and exterior lock stile
Full-mortise butt hinge	3	Hinge jamb/stile
Aluminum door sweeps	2	Interior and exterior bottom rail
AT (0.21") mill finish threshold	1	Sill

Drainage:

Drainage Method	Size	Quantity	Location
Sloped sill		1	Sill

Thermal Transmittance (U-factor)

Measured Test Data

Heat Flows

1. Total Measured Input into Metering Box (Q_{total})	651.18 Btu/hr
2. Surround Panel Heat Flow (Q_{sp})	27.46 Btu/hr
3. Surround Panel Thickness	6.00 inches
4. Surround Panel Conductance	0.0297 Btu/hr·ft ² ·F
5. Metering Box Wall Heat Flow (Q_{mb})	5.52 Btu/hr
6. EMF vs Heat Flow Equation (equivalent information)	0.0107*EMF + 0.007
7. Flanking Loss Heat Flow (Q_{fl})	2.43 Btu/hr
8. Net Specimen Heat Loss (Q_s)	615.78 Btu/hr

Areas

1. Test Specimen Projected Area (A_s)	22.43 ft ²
2. Test Specimen Interior Total (3-D) Surface Area (A_h)	26.14 ft ²
3. Test Specimen Exterior Total (3-D) Surface Area (A_c)	22.61 ft ²
4. Metering Box Opening Area (A_{mb})	36.07 ft ²
5. Metering Box Baffle Area (A_{bi})	33.94 ft ²
6. Surround Panel Interior Exposed Area (A_{sp})	13.64 ft ²

Test Conditions

1. Average Metering Room Air Temperature (t_h)	69.84 F
2. Average Cold Side Air Temperature (t_c)	-0.41 F
3. Average Guard/Environmental Air Temperature	71.26 F
4. Metering Room Average Relative Humidity	4.68 %
5. Metering Room Maximum Relative Humidity	5.14 %
6. Metering Room Minimum Relative Humidity	4.30 %
7. Measured Cold Side Wind Velocity (Perpendicular Flow)	12.66 mph
8. Measured Warm Side Wind Velocity (Parallel Flow)	NA mph
9. Measured Static Pressure Difference Across Test Specimen	0.00" ± 0.04"H ₂ O

Average Surface Temperatures

1. Metering Room Surround Panel	68.15 F
2. Cold Side Surround Panel	0.45 F

Results

1. Thermal Transmittance of Test Specimen (U_s)	0.39 Btu/hr·ft ² ·F
2. Standardized Thermal Transmittance of Test Specimen (U_{st})	0.38 Btu/hr·ft ² ·F

Thermal Transmittance (U-factor)

Calculated Test Data

CTS Method

1. Warm Side Emittance of Glass (e_i)	0.84
2. Cold Side Emittance of Glass	0.84
3. Warm Side Frame Emittance*	0.80
4. Cold Side Frame Emittance*	0.80
5. Warm Side Sash/Panel/Vent Emittance*	0.80
6. Cold Side Sash/Panel/Vent Emittance*	0.80
7. Warm Side Baffle Emittance (e_{b1})	0.92
8. Cold Side Baffle Emittance (e_{b2})	N/A
9. Equivalent Warm Side Surface Temperature	49.80 F
10. Equivalent Cold Side Surface Temperature	5.18 F
11. Warm Side Baffle Surface Temperature	68.53 F
12. Cold Side Baffle Surface Temperature	N/A F
13. Measured Warm Side Surface Conductance (h_h)	1.37 Btu/hr·ft ² ·F
14. Measured Cold Side Surface Conductance (h_c)	4.91 Btu/hr·ft ² ·F
15. Test Specimen Thermal Conductance (C_s)	0.62 Btu/hr·ft ² ·F
16. Convection Coefficient (K_c)	0.32 Btu/(hr·ft ² ·F ^{1.25})
17. Radiative Test Specimen Heat Flow (Q_{r1})	314.65 Btu/hr
18. Conductive Test Specimen Heat Flow (Q_{c1})	301.13 Btu/hr
19. Radiative Heat Flux of Test Specimen (q_{r1})	14.03 Btu/hr·ft ² ·F
20. Convective Heat Flux of Test Specimen (q_{c1})	13.42 Btu/hr·ft ² ·F
21. Standardized Warm Side Surface Conductance (h_{sth})	1.20 Btu/hr·ft ² ·F
22. Standardized Cold Side Surface Conductance (h_{stc})	5.28 Btu/hr·ft ² ·F
23. Standardized Thermal Transmittance (U_{st})	0.38 Btu/hr·ft ² ·F

Test Duration

1. The environmental systems were started at 07:23 hours, 03/08/16.
2. The test parameters were considered stable for two consecutive four hour test periods from 09:03 hours, 03/09/16 to 17:03 hours, 03/09/16.
3. The thermal performance test results were derived from 13:03 hours, 03/09/16 to 17:03 hours, 03/09/16.

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

**Stated per NFRC 101*

Glazing Deflection:

	Panel
Edge Gap Width	0.53"
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.50"
Center gap width at laboratory ambient conditions on day of testing	0.50"
Center gap width at test conditions	0.41"

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.”

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. The ratings were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy. The data acquisition frequency is 5 minutes.

The following calibration dates are outside of allowed: Annual Calibration was more than 1 year ago, Last CTS Check was more than 1 year ago, Last EMF/Flanking check was more than 1 year ago.

This report is a reissue of the original Report No. F4753.01-116-46. This report is reissued in the name of CR Laurence Co., Inc. through written authorization of Oldcastle BuildingEnvelope.

"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."

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period. The test record retention end date for this report is March 09, 2020.

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 tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI

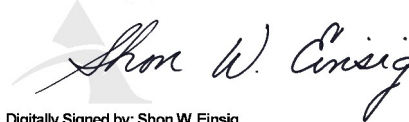
Tested By:



Digitally Signed by: Ryan P. Moser

Ryan P. Moser
Senior Technician

Reviewed By:



Digitally Signed by: Shon W. Einsig

Shon W. Einsig
Senior Technician
Individual-In-Responsible-Charge

RPM:kmm
F4753.04-116-46

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

- Appendix-A: CTS Calibration Data (1)
- Appendix-B: Surround Panel Wiring Diagram (1)
- Appendix-C: Baffle Wiring Diagram (1)
- Appendix-D: Submittal Form and Drawings (34)

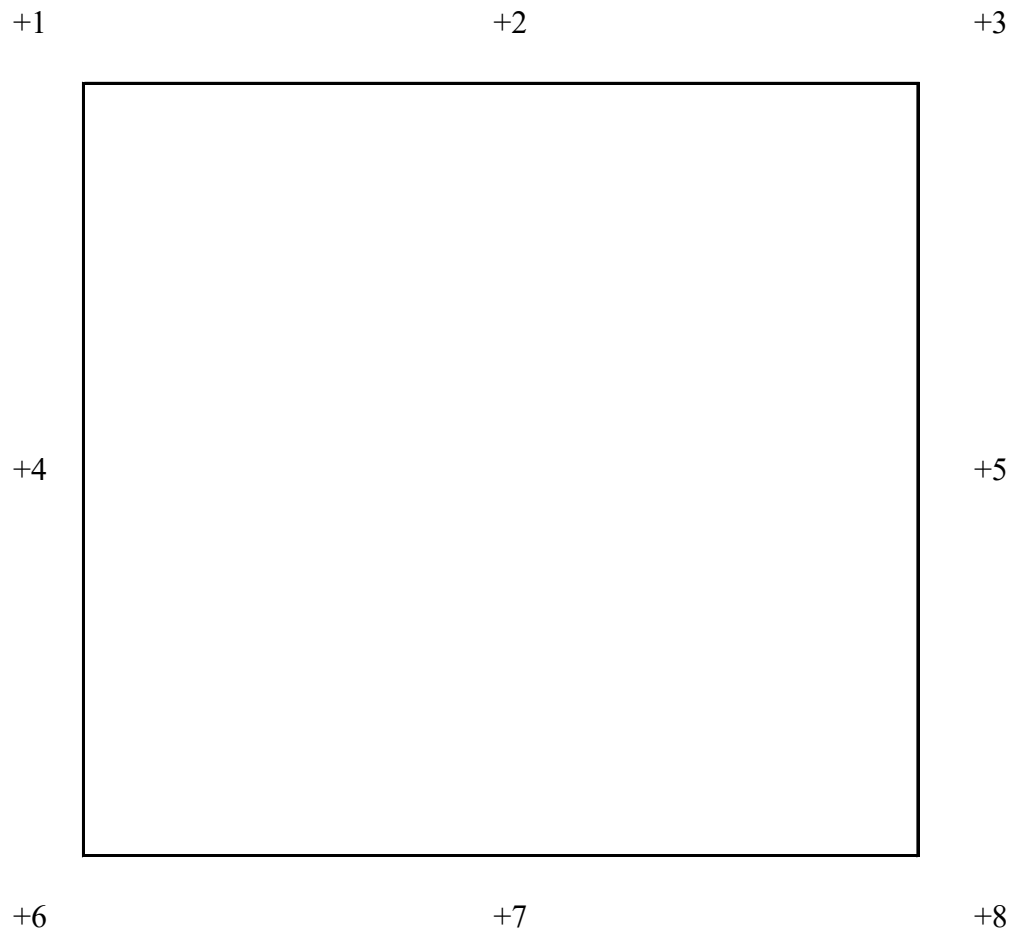
Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
.04R0	08/31/18	All	Original Report Issue - Reissue of Report No. F4753.01-116-46 in the name of CR Laurence Co., Inc.

Appendix A: CTS Calibration Data

1. CTS Test Date	04/04/14
2. CTS Size	21.53 ft ²
3. CTS Glass/Core Conductance	0.42 Btu/hr·ft ² ·F
4. Warm Side Air Temperature	69.80 F
5. Cold Side Air Temperature	-0.40 F
6. Warm Side Average Surface Temperature	53.96 F
7. Cold Side Average Surface Temperature	3.48 F
8. Convection Coefficient (K _c)	0.30 Btu/(hr·ft ² ·F ^{1.25})
9. Measured Cold Side Surface Conductance (h _c)	5.47 Btu/hr·ft ² ·F
10. Measured Thermal Transmittance	0.30 Btu/hr·ft ² ·F

Appendix B: Surround Panel Wiring Diagram



Appendix C: Baffle Wiring Diagram



Appendix D: Submittal Form and Drawings

NFRC PRODUCT CERTIFICATION PROGRAM

Submittal Form for Test Samples



National Fenestration
Rating Council®

For use by Manufacturers, Lineal Suppliers and Fabricators

1. Information on Production of the Test Sample (complete **ALL** fields):

Manufacturer: Oldcastle BuildingEnvelope Date of sample manufacture: Feb. 22, 2016
 Plant Address where manufactured: 803 Airport Rd
 City: Terrell State: TX Zip Code: 75160
 Name of IA: Keystone Phone: 972-551-6255 Fax: _____

2. Product Information (complete **APPLICABLE** fields):

Existing Product Line ID (CPD) No.: _____ Product/Operator Type (Table 4-3 of NFRC 100): Swinging Door w/ Frame
 Series/Model: MS-375TC Thermal Composite Door

3. Test sample is being submitted for (select **ONE**):

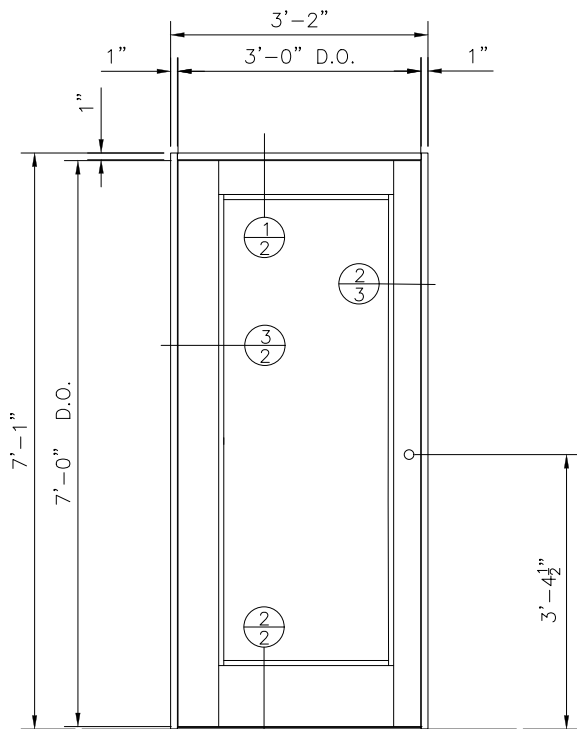
- a. Validation for Initial Certification (prototype only) no plant qualification
- b. Validation for Initial Certification or Recertification (production line unit) & plant qualification
- c. Plant Qualification Only (production line unit)
- d. Test Only Alternative (production line unit) & plant qualification

I, Phil Clark, as the designated agent for Oldcastle BuildingEnvelope do hereby attest that the foregoing information is true to the best of my information, knowledge, and belief. Further, if the unit is identified in Section 3 as a production line unit, I hereby authorize the NFRC-accredited testing laboratory to send a copy of the test report to the IA identified above for plant qualification purposes pursuant to the NFRC Product Certification Program.

Signature: Phil Clark Digitally signed by Phil Clark
DN: cn=Phil Clark, o=Oldcastle BuildingEnvelope, ou=ema@oldcastle.com, c=US
Date: 2016.12.16.14:17:33 -0800 Date: 12/16/16

For Laboratory Use Only

1. Laboratory: Intertek
 2. Date Sample Received: 2/29/16 Test Report #: F4753
 3. Date Sample Tested: 3/9/16 By: RPM
 4. Modifications made: _____

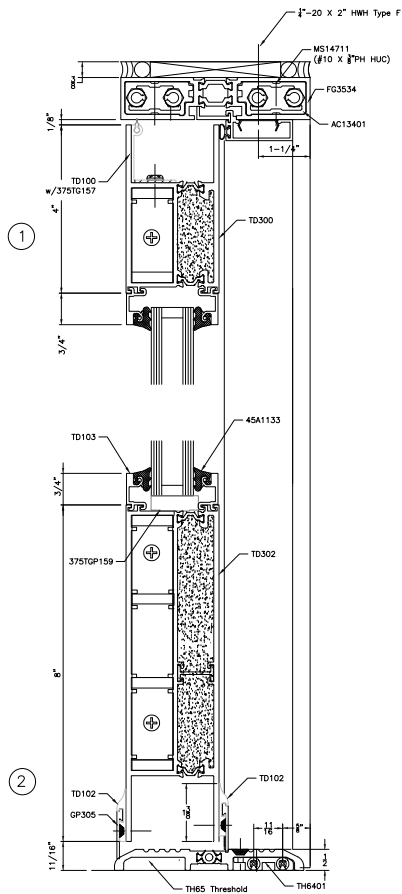


Test:
 AAMA 1503, AAMA 507, NFRC 102
 NFRC Simulations, CSA

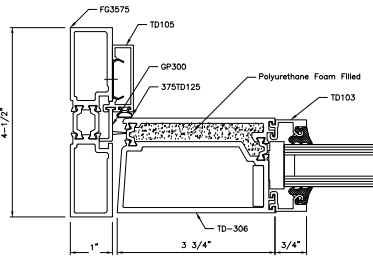
Door Hardware Test # 1		
Qty	Hardware #	Description:
1-1/2 Pair per door	375TBH	
1	DH22900	1-1/2" Back Set Hook Bolt Lock
1	DH008	H.D.Flush Bolt
2	PR032/PR034	Push/Pull
2	375TLC	Cylinder Kit
1	375TG159	Bulb Gasket-Door Stops
	70-3/4" x 27-13/16"	1/4" clear Temp.-Solarban 275 1/2"-12.7mm Technofoam spacer 90% Argon-1/4" clear temp.

	Report #:	F4753-116-46
	Date:	03/09/2016
	Verified by:	<i>Ryan P. Palmer</i>

REVISIONS	
C.R. LAURENCE CO. ARCHITECTURAL PRODUCTS <small>2100 E. 38th Street, Los Angeles, CA 90058 www.crlaurence.com</small>	
375TC THERMAL COMPOSITE DOOR	
Clearing Contractor:	Job Name:
DATE: 6.25.2018 DRAWN BY: GDO CHECKED BY: XX SCALE: AS SHOWN JOB #: PTC768309	SHT <u>1</u> OF <u>3</u>

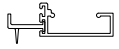


3



	Report #:	F4753-116-46
	Date:	03/09/2016
	Verified by:	<i>Raymond P. Mauer</i>

REVISIONS	
C.R. LAURENCE CO. ARCHITECTURAL PRODUCTS 2100 E. 38th Street, Los Angeles, CA 90058 www.crlaurence.com	
Job Name: 375TC THERMAL COMPOSITE DOOR	Drawing Contractor: 375TC
DATE:	6.25.2018
DRAWN BY:	GDO
CHECKED BY:	XX
SCALE:	AS SHOWN
JOB #:	PTC768309
SHT <u>2</u> OF <u>3</u>	



TD106 Assy.
(TD105 w/ GP300)



TD105



TD100



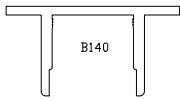
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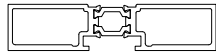
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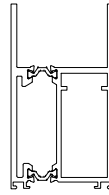
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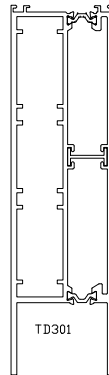
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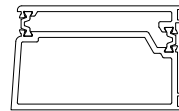
TD64



TD300



TD301



TD506



GP300



GP302



GP303



GP305



REVISIONS



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ARCHITECTURAL PRODUCTS
2100 E. 38th Street, Los Angeles, CA 90008
www.crlaurence.com

NEW THERMAL DOOR
Thermal Testing

Job Name

Erasing Contractor

DATE: 6.25.2018
DRAWN BY: GDD
CHECKED BY: XX
SCALE: AS SHOWN
JOB #: PTC768309

SHT 6 OF 7