Intertek | Architectural Testing

NFRC 102-2010 THERMAL PERFORMANCE
TEST REPORT

Rendered to:

CR LAURENCE CO., INC.

SERIES/MODEL: 250T / 400T Thermal Door - 1" Frame
TYPE: Swinging Door with Frame

Summary of Results			
Standardized Thermal Transmittance (U-Factor)			0.53
Unit Size:		37-3/4" x 82-3/8" (959 mm x 2092 mm) (Model Size)	
Layer 1:	1/4"	Clear	
Gap 1:	0.53"	A1-D: Aluminum Spacer	100% Air*
Layer 2:	1/4"	PPG Solarban 70XL (e=0.018*, #3)	

Reference must be made to Report No. D6567.01-116-46, dated 09/25/14 for complete test specimen description and data.

Intertek | Architectural Testing

NFRC 102-2010 THERMAL PERFORMANCE TEST REPORT

Rendered to:

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

Report Number: D6567.01-116-46
Test Date: 09/13/14
Report Date: 09/25/14

Test Sample Identification:

Series/Model: 250T / 400T Thermal Door - 1" Frame

Type: Swinging Door with Frame

Overall Size: 37-3/4" x 82-3/8" (959 mm x 2092 mm) (Model Size)
NFRC Standard Size: 37.8" x 82.3" (960 mm wide x 2090 mm high)

Test Sample Submitted by: Client

Test Sample Submitted for: Validation for Initial Certification (Production Line Unit) & Plant Qualification

Test Procedure: U-factor tests were performed in a Guarded Hot Box in accordance with NFRC 102-2010, *Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems* .

Test Results Summary:

Standardized U-factor (U_{st}): 0.53 Btu/hr·ft^2·F (CTS Method)

Test Sample Description:

Frame:

Material:	AU (0.20"): Aluminum with Thermal Improvement - All Members		
Size:	37-3/4" x 82-3/8" (Model 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		

Panel:

Material:	AT (0.36"): Aluminum with Thermal Breaks - All Members		
Size:	35-5/8" x 80-1/2"		
Daylight Opening:	29-1/4" x 73-1/8"	**Glazing Method:**	Exterior
Exterior Color:	Clear	**Exterior Finish:**	Anodized
Interior Color:	Clear	**Interior Finish:**	Anodized
Corner Joinery:	Square Cut / Screws / Unsealed		

Glazing Information:

Layer 1:	1/4"	Clear	
Gap 1:	0.53"	A1-D: Aluminum Spacer	100% Air*
Layer 2:	1/4"	PPG Solarban 70XL (e=0.018*, #3)	
Gas Fill Method:		N/A*	

**Stated per Client/Manufacturer*
N/A Non-Applicable

Test Sample Description: (Continued)

Weatherstripping:

Description	Quantity	Location
Polypile	1 row	Head and jambs
Single-fin gasket	1 row	Bottom rail
EPDM compression gasket	1 row	Interior glazing perimeter
EDPM wedge gasket	1 row	Exterior glazing perimeter

Hardware:

Description	Quantity	Location
Mill finished AU (0.18") threshold	1	Sill
Drop-pin hinge	3	Hinge jamb/stile
AU (0.20") door stop	3	Head and jambs
Aluminum door sweep	1	Bottom rail

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})	903.44	Btu/hr
2. Surround Panel Heat Flow (Q_{sp})	29.17	Btu/hr
3. Surround Panel Thickness	6.00	inches
4. Surround Panel Conductance	0.0298	Btu/hr·ft^2·F
5. Metering Box Wall Heat Flow (Q_{mb})	30.39	Btu/hr
6. EMF vs Heat Flow Equation (equivalent information)	0.0334*EMF + 0.009	
7. Flanking Loss Heat Flow (Q_{fl})	-3.47	Btu/hr
8. Net Specimen Heat Loss (Q_s)	847.34	Btu/hr

Areas

1. Test Specimen Projected Area (A_s)	21.59	ft^2
2. Test Specimen Interior Total (3-D) Surface Area (A_h)	26.05	ft^2
3. Test Specimen Exterior Total (3-D) Surface Area (A_c)	21.98	ft^2
4. Metering Box Opening Area (A_{mb})	36.33	ft^2
5. Metering Box Baffle Area (A_{bl})	30.99	ft^2
6. Surround Panel Interior Exposed Area (A_{sp})	14.74	ft^2

Test Conditions

1. Average Metering Room Air Temperature (t_h)	69.80	F
2. Average Cold Side Air Temperature (t_c)	-0.40	F
3. Average Guard/Environmental Air Temperature	71.25	F
4. Metering Room Average Relative Humidity	3.81	%
5. Metering Room Maximum Relative Humidity	4.33	%
6. Metering Room Minimum Relative Humidity	3.28	%
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_2O

Average Surface Temperatures

1. Metering Room Surround Panel	67.47	F
2. Cold Side Surround Panel	1.06	F

Results

1. Thermal Transmittance of Test Specimen (U_s)	0.56	Btu/hr·ft^2·F
2. Standardized Thermal Transmittance of Test Specimen (U_{st})	0.53	Btu/hr·ft^2·F

Thermal Transmittance (U-factor)

Calculated Test Data

CTS Method

1.	Warm Side Emittance of Glass (e_1)	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	41.08	F
10.	Equivalent Cold Side Surface Temperature	7.23	F
11.	Warm Side Baffle Surface Temperature	69.10	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)	5.14	Btu/hr·ft^2·F
15.	Test Specimen Thermal Conductance (C_s)	1.16	Btu/hr·ft^2·F
16.	Convection Coefficient (K_c)	0.28	Btu/(hr·ft^2·F$^{1.25}$)
17.	Radiative Test Specimen Heat Flow (Q_{r1})	442.88	Btu/hr
18.	Conductive Test Specimen Heat Flow (Q_{c1})	404.46	Btu/hr
19.	Radiative Heat Flux of Test Specimen (q_{r1})	20.51	Btu/hr·ft^2·F
20.	Convective Heat Flux of Test Specimen (q_{c1})	18.73	Btu/hr·ft^2·F
21.	Standardized Warm Side Surface Conductance (h_{sth})	1.22	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})	0.53	Btu/hr·ft^2·F

Test Duration

1. The environmental systems were started at 14:21 hours, 09/12/14.
2. The test parameters were considered stable for two consecutive four hour test periods from 03:41 hours, 09/13/14 to 11:41 hours, 09/13/14.
3. The thermal performance test results were derived from 07:41 hours, 09/13/14 to 11:41 hours, 09/13/14.

The reported Standardized Thermal Transmittance (Ust) was determined using CTS Method, per Section 8.2(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)	0.53"
Center gap width at laboratory ambient conditions on day of testing	0.53"
Center gap width at test conditions	0.44"

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.

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 1.57%.

Required annual calibrations for the Architectural Testing Inc. 'thermal test chamber' (ICN 000001) in York, Pennsylvania were last conducted in May 2014 in accordance with Architectural Testing Inc. calibration procedure. A CTS Calibration verification was performed May 2014. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed June 2014.

"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."

Architectural Testing, Inc. 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 Architectural Testing, Inc. for the entire test record retention period. The test record retention end date for this report is September 13, 2018.

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 Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Tested By:

Digitally Signed by: Ryan P. Moser

Ryan P. Moser
Technician

Reviewed By:

Digitally Signed by: Shon W. Einsig

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

RPM:klb
D6567.01-116-46

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 (24)

ACCREDITED

Architectural Testing, Inc. is accredited by the International Accreditation Service (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS.

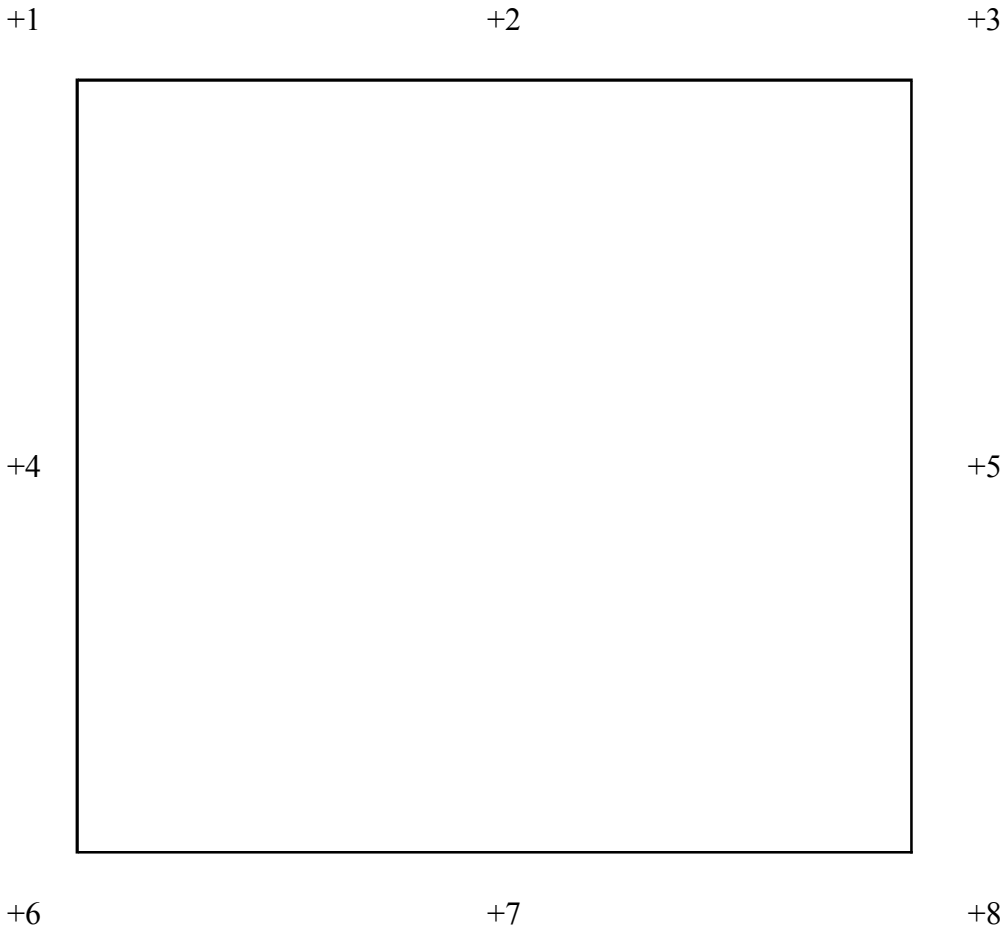
Revision Log

Rev. #	Date	Page(s)	Revision(s)
.01R0	09/25/14	All	Original Report Issue. Work requested by Ronald Wooten of CR Laurence Co., Inc.

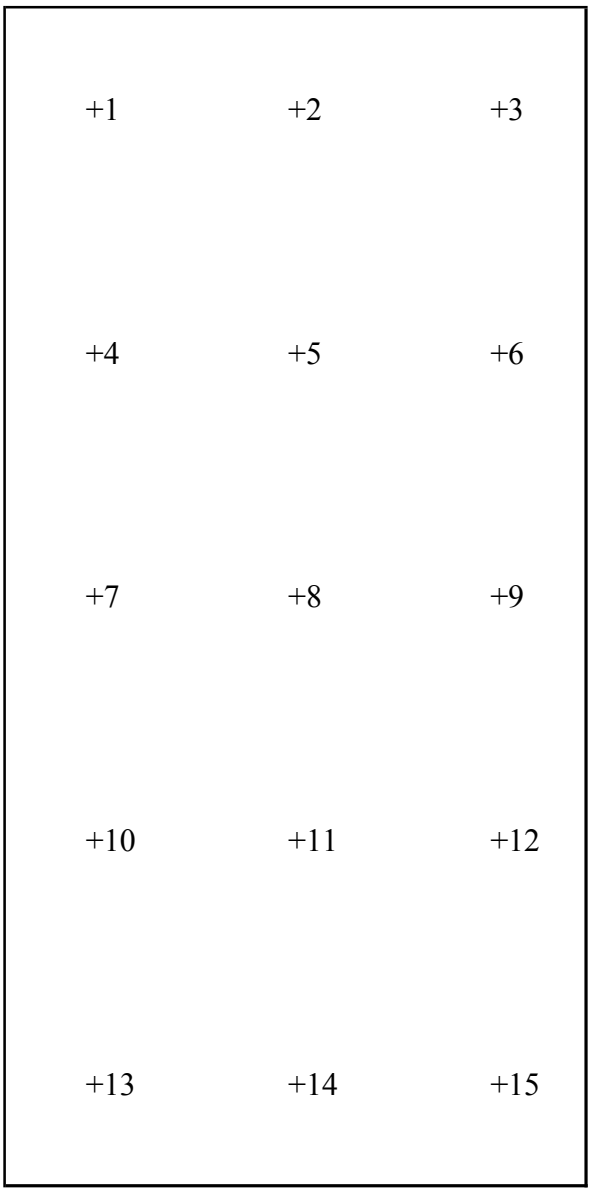
Appendix A: CTS Calibration Data

1.	CTS Test Date	03/24/14	
2.	CTS Size	21.53	ft^2
3.	CTS Glass/Core Conductance	0.42	$Btu/hr \cdot ft^2 \cdot F$
4.	Warm Side Air Temperature	69.81	F
5.	Cold Side Air Temperature	-0.64	F
6.	Warm Side Average Surface Temperature	53.56	F
7.	Cold Side Average Surface Temperature	3.45	F
8.	Convection Coefficient (K_c)	0.28	$Btu/(hr \cdot ft^2 \cdot F^{1.25})$
9.	Measured Cold Side Surface Conductance (h_c)	5.14	$Btu/hr \cdot ft^2 \cdot F$
10.	Measured Thermal Transmittance	0.29	$Btu/hr \cdot ft^2 \cdot F$

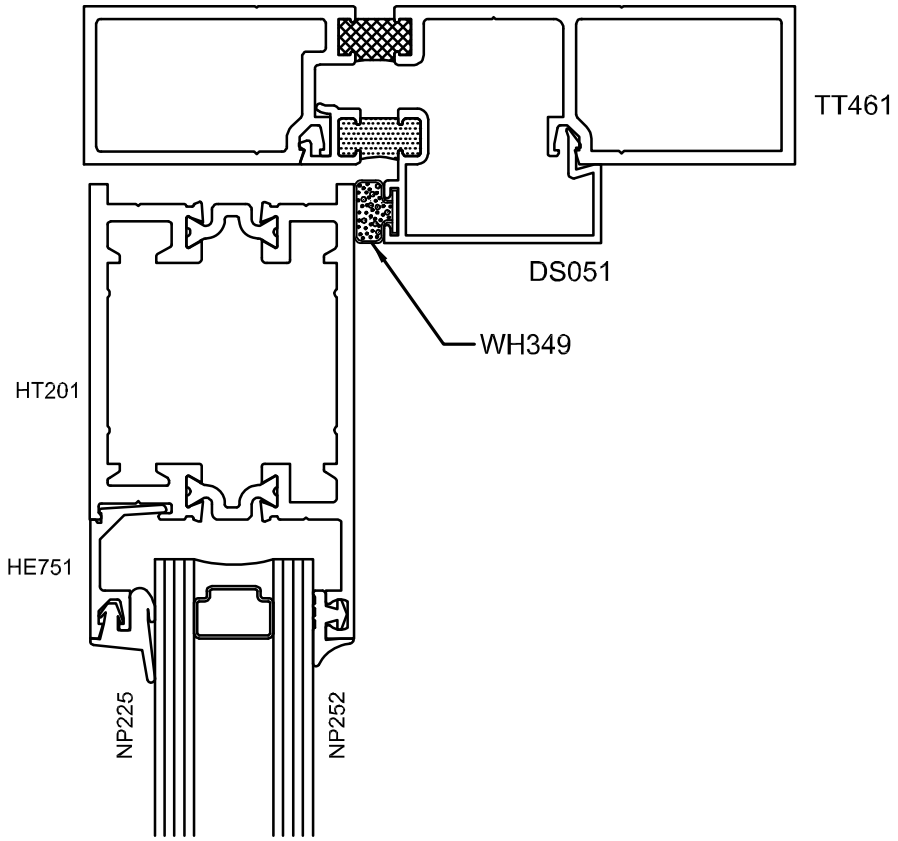
Appendix B: Surround Panel Wiring Diagram



Appendix C: Baffle Wiring Diagram

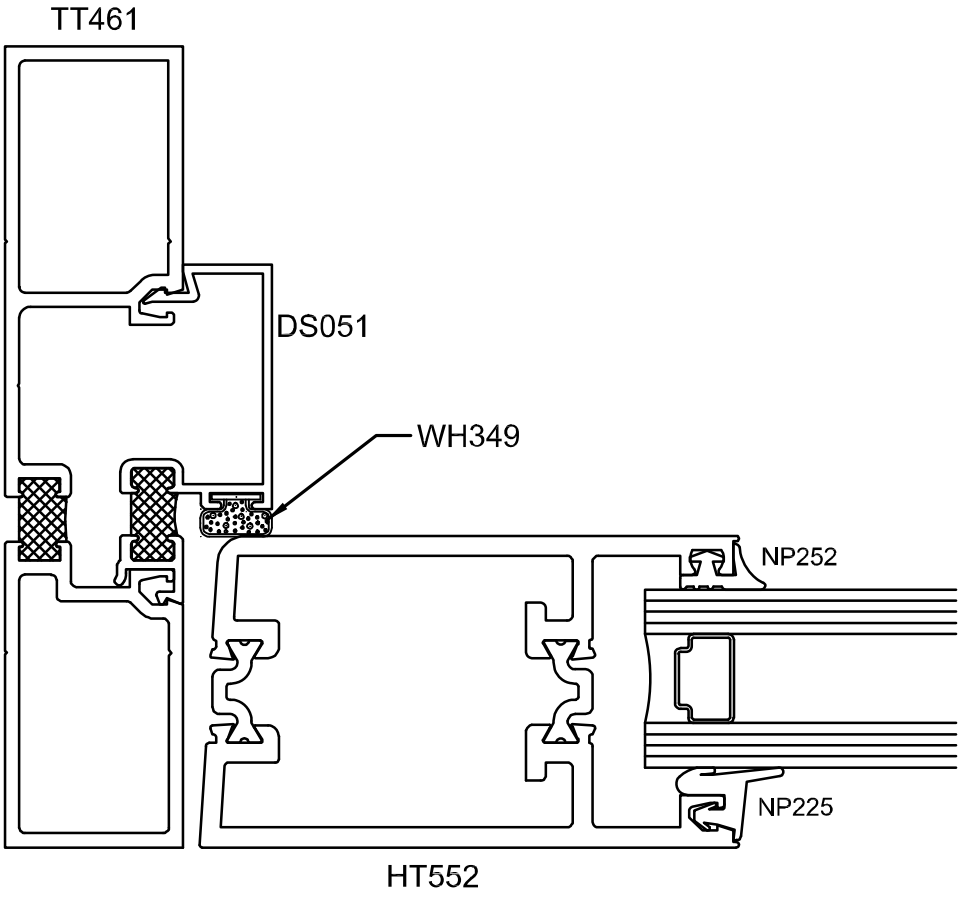


Appendix D: Submittal Form and Drawings



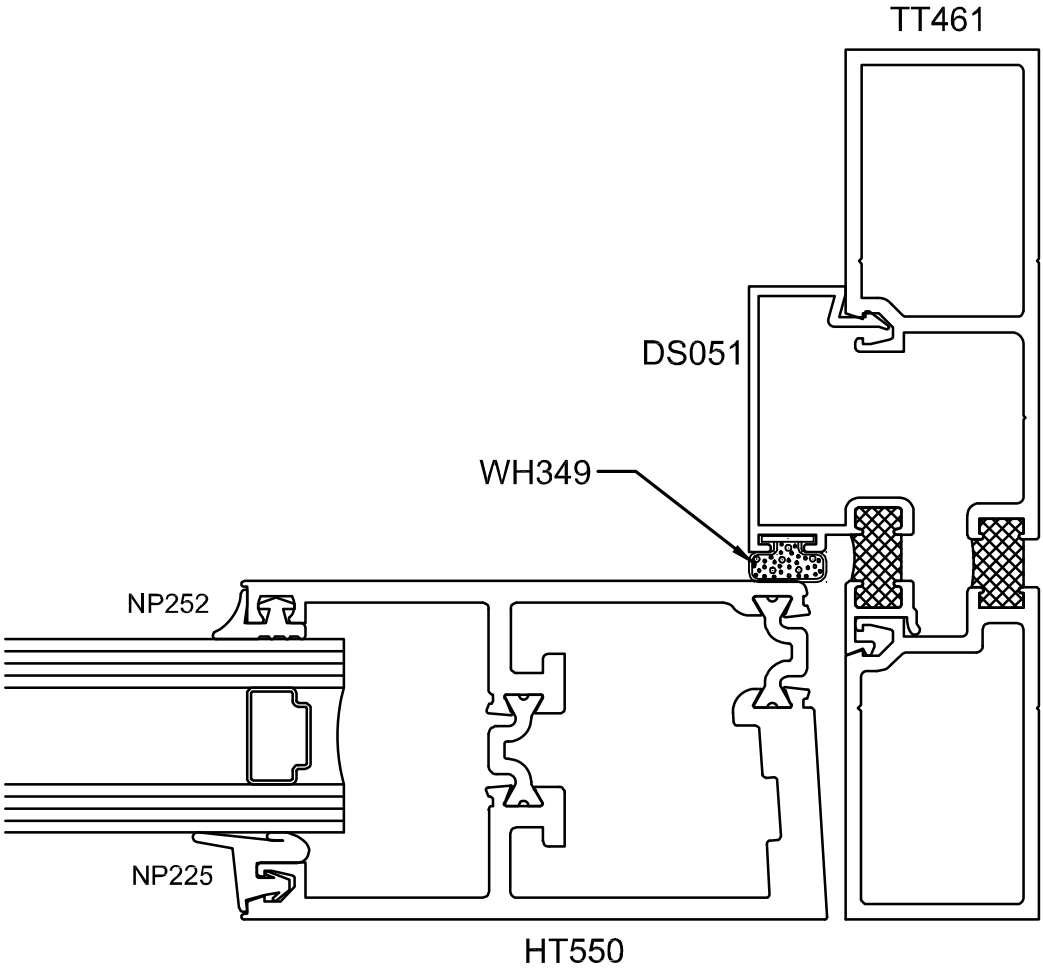
250-T ENTRANCE TOP RAIL
1" SUBFRAME HEAD
OFFSET HUNG

HT201 / HE751 / TT461 / DS051



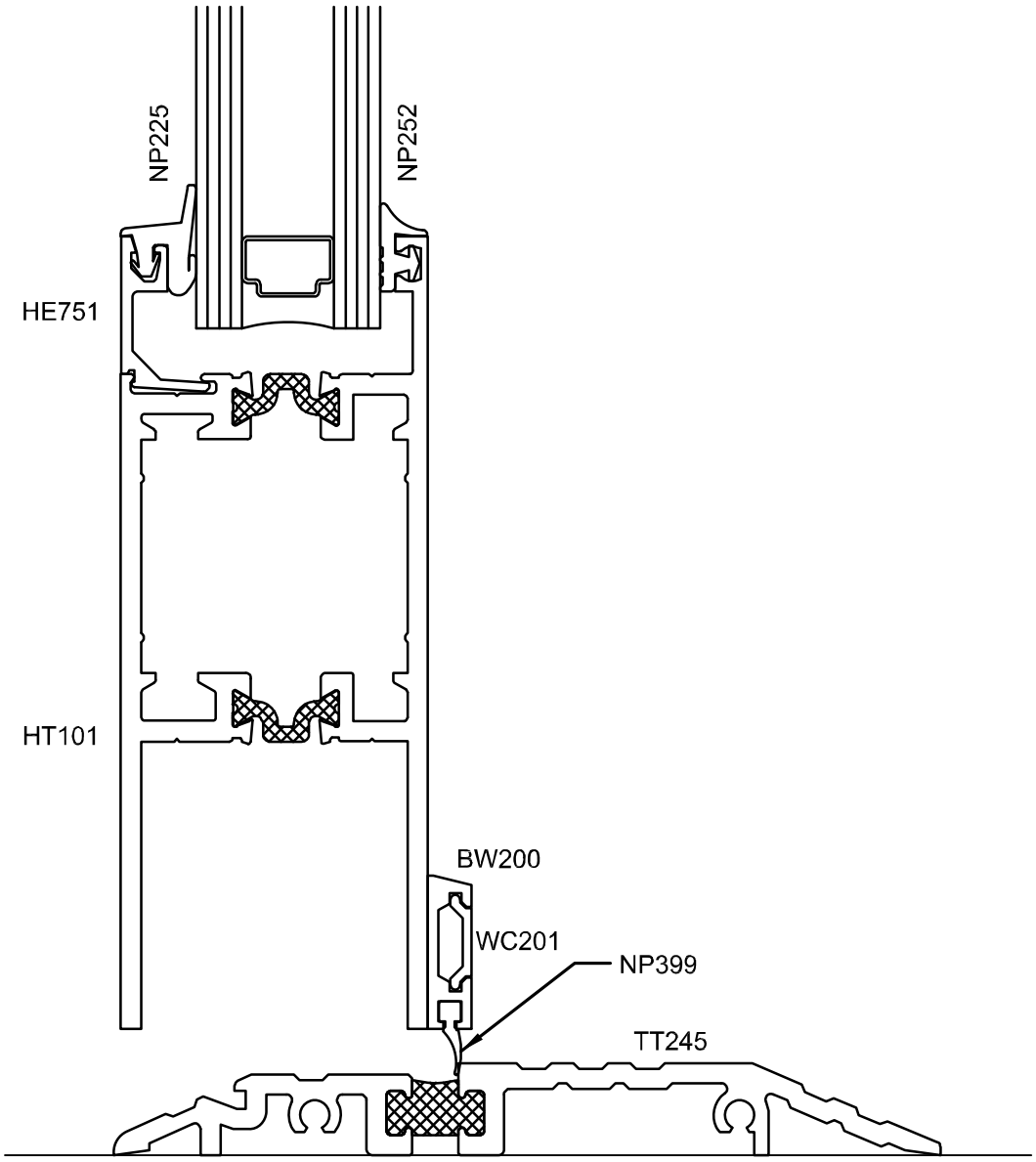
250-T ENTRANCE LATCH STILE
1" SUBFRAME JAMB

HT552 / TT461 / DS051



250-T ENTRANCE HINGE STILE
1" SUBFRAME JAMB

HT550/ TT461 / DS051



250-T ENTRANCE SILL

HT101 / HE751 / TT245