



Quality Accuracy Assurance

Fenestration Testing Laboratory, Inc.

8148 N.W. 74th Avenue Medley, Florida 33166 Phone: (305) 885-3328 Fax: (305) 885-3329 Toll Free: (844) FTL-TEST (385-8378)
E-mail: clientservices@ftl-inc.com Web: www.ftl-inc.com

Report Date: 1/17/2018
Test Date: 1/16/2018
Expiration Date: 1/16/2023
Lab Number: 9924
Project Number: 17-7652
Revision Number: 0

THERMAL PERFORMANCE TEST REPORT

Manufacture: Coral Architectural Products

Address: 4750 Distribution Drive
Tampa, Florida 33605

Specifications: ANSI/NFRC 102-2017: Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.

PRODUCT DESCRIPTION

Model Designation:	Series; FL600T Storefront System
Operating Type:	GWWW
Overall Size:	2000 mm (79") by 2000 mm (79") high
NFRC Standard Size:	2000 mm (79") by 2000 mm (79") high

Frame Construction

Frame Material and Finish:	(AL) Painted aluminum alloy with thermally broken members
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Glazing Description

Layer 1:	1/4 clear **(Cardinal LoE 270 on surface #2 e=0.037)
Gap:	1/2 gap using a Cardinal XL Spacer
Layer 2:	1/4 clear

**as per manufacture

Glazing Method

Interior Condition:	EPDM gasket
Exterior Condition:	Extruded aluminum glazing bead with EPDM gasket

Gas Type	Filling Technique	Gas Fill Percentage
None	None	None

**as per manufacture

Daylight Opening

35 3/4" by 83 1/2" high

Weather Stripping

Quantity	Description	Location
None	None	None



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Hardware		
Quantity	Description	Location
None	None	None

Weep Holes		
Quantity	Description	Location
Four	1/4" drain hole	Sub-sill at vertical members

Reinforcement	
Material	Location
None	None

Dividers/Grids		
Grid Size	Material	Grid Pattern
None	None	None



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Measured Test Data

Heat Flows

- | | |
|---|--------------------------------|
| 1. Total Measured Input into Metering Box (Qtotal) | 1604.46 tu/hr |
| 2. Surround Panel Heat Flow (Qsp) | 145.76 Btu/hr |
| 3. Surround Panel Thickness | 6.0 inches |
| 4. Surround Panel Conductance | 0.04 Btu/hr-ft ² -F |
| 5. Metering Box Wall Heat Flow (Qmb) and Flanking Heat Flow (Qfl) | -8.18 Btu/hr |
| 6. EMF vs Heat Flow Equation (equivalent information) | -8.56x35.61 |
| 7. Net Specimen Heat Loss (Qs) | 1466.88 Btu/hr |

Areas

- | | |
|---|------------------------|
| 1. Test Specimen Projected Area (As) | 43.34 ft ² |
| 2. Test Specimen Interior Total (3-D) Surface Area (Aint) | 45.99 ft ² |
| 3. Test Specimen Exterior Total (3-D) Surface Area (Aext) | 44.02 ft ² |
| 4. Metering Box Opening Area (Amb) | 103.78 ft ² |
| 5. Metering Box Baffle Area (Ab1) | 92.91 ft ² |
| 6. Surround Panel Interior Exposed Area (Asp) | 60.44 ft ² |

Test Conditions

- | | |
|---|----------|
| 1. Average Metering Room Air Temperature | 69.80 F |
| 2. Average Cold Side Air Temperature | -0.12 F |
| 3. Average Guard/Environmental Air Temperature | 72.9 F |
| 4. Metering Room Average Relative Humidity | 11.8 % |
| 5. Measured Cold Side Wind Velocity (Perpendicular Flow) | 11.9 mph |
| 6. Measured Static Pressure Difference Across Test Specimen | 0.0 psf |

Surface Temperature Data

- | | |
|-----------------------------|---------|
| 1. Warm side surround panel | 66.81 F |
| 2. Cold side surround panel | 1.34 F |

Results

- | | |
|--|--------------------------------|
| 1. Thermal Transmittance of Test Specimen (Us) | 0.48 Btu/hr-ft ² -F |
| 2. Standardized Thermal Transmittance of Test Specimen (Ust) | 0.45 Btu/hr-ft ² -F |



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Calculated Test Data

CTS Method

1. Emittance of Glass (e_i)	0.84
2. Warm Side Baffle Emittance (eb_1)	0.92
3. Equivalent Warm Side Surface Temperature	46.81 F
4. Equivalent Cold Side Surface Temperature	6.53 F
5. Warm Side Baffle Surface Temperature	69.07 F
6. Measured Warm Side Surface Conductance (hh)	1.47 Btu/hr·ft ² ·F
7. Measured Cold Side Surface Conductance (hc)	5.09 Btu/hr·ft ² ·F
8. Test Specimen Thermal Conductance (C_s)	0.84 Btu/hr·ft ² ·F
9. Convection Coefficient (K_c)	0.34 Btu/(hr·ft ² ·F ^{1.25})
10. Radiative Test Specimen (Q_{r1})	717.45 Btu/hr
11. Conductive Test Specimen Heat Flow (Q_{c1})	749.41 Btu/hr
12. Radiative Heat Flux of Test Specimen (q_{r1})	16.55 Btu/hr·ft ² ·F
13. Convective Heat Flux of Test Specimen (q_{c1})	17.29 Btu/hr·ft ² ·F
14. Standardized Warm Side Surface Conductance (h_{sth})	1.21 Btu/hr·ft ² ·F
15. Standardized Cold Side Surface Conductance (h_{stc})	5.28 Btu/hr·ft ² ·F
16. Standardized Thermal Transmittance (U_{st})	0.45 Btu/hr·ft ² ·F

Test Duration

1. The environmental systems were started at 11:04 hours, on 1/15/2018.
2. The test parameters were considered stable for two consecutive four hour test periods from 00:04 hours, on 1/16/2018 to 08:04 hours, on 1/16/2018.
3. The thermal performance test results were derived from 04:04 hours, on 1/16/2018 to 08:04 hours, on 1/16/2018.

The reported Standardized Thermal Transmittance (U_{st}) was determined using CTS method per Section 8.2 (A) of NFRC 102.

Glazing Deflection (in.)	Left Section	Right Section
Gap width upon receipt of sample in laboratory	0.492"	0.496"
Gap width at laboratory ambient condition on day of testing	0.488"	0.501"
Center of gap at conclusion of test	0.499"	0.504"



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Remarks

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 calibration of Fenestration Testing Laboratory's "thermal test chamber" was conducted November 2017.

"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."

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

Drawings referenced in this document are an integral part of this report, therefore, are required when distributing this test report. Test results obtained represent the actual value of the tested specimens and do not constitute opinion, endorsement or certification by this laboratory.

This test report is considered the exclusive property of the client named herein and is applicable to the sample tested. This report may not be reproduced without the approval of Fenestration Testing Laboratory, Inc and if so must be in full.

Rounding of numerical values are per NFRC 601, NFRC Unit and Measurement Policy.

Testing was conducted in full compliance with NFRC requirements.

As per the client, the sample described in this test report was a production line for initial certification.

An estimate of the measurement of uncertainty for these results is available upon request.



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Revision History Table			
Revision	Description	Author	Effective Date
0	Initial Release	Jose Sanchez	1/17/2018

FENESTRATION TESTING LABORATORY, INC.

Jose Sanchez

Jose Sanchez
Test Performed by

Jose Sanchez
Person - in- Responsible- Charge



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APPENDIX

Fenestration Product Drawings and Bill of Material



DESCRIPTION

REV	BY	DATE
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0.5	0.5
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INDEX TO DRAWINGS AND NOTES

FL600T AAMA
TEST DRAWINGS

ELIZABETH A. BROADWAY
PROFESSIONAL ENGINEER
FLORIDA REGISTRATION NO. 38558

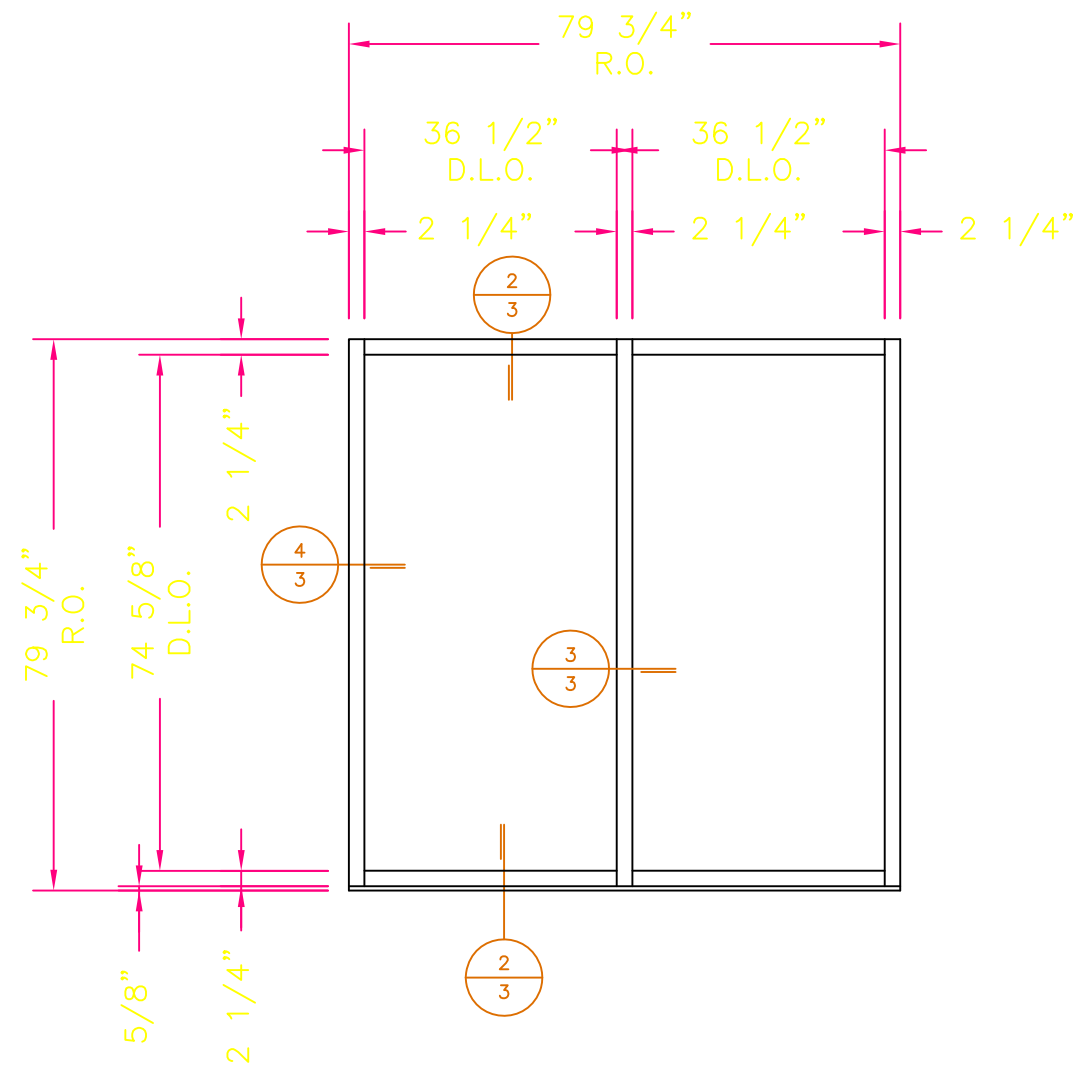


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BE-4545


PROJECT NO. FL600T	
DRAWN MRG	DATE 10/13/17
CHECKED W/S	APPROVED ###
SHEET	

Window wall was simulated per NFRC 100 Table 4-3 which states; Window walls shall be tested and simulated with intermediate verticals as jambs and standard head and sill members. The validation unit is not a product that will be found in a real situation. It is required that the intermediate verticals to have glass pockets at jambs replaced with wood block inserts for a validation of the simulated product line.



TYPICAL ELEVATION

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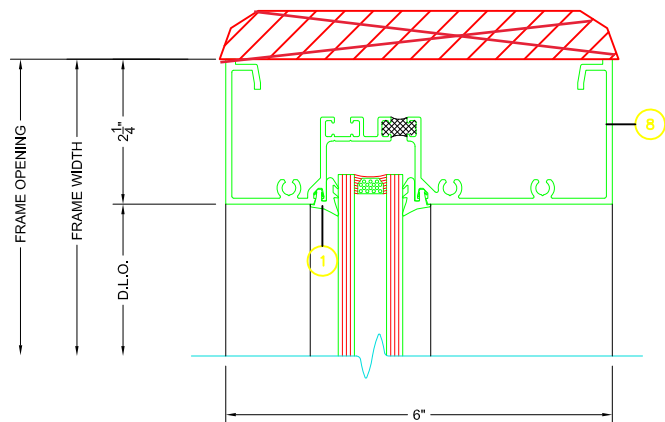
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Tampa, Florida 33606 813-251-9244

Fax 813-251-9330 Bus. Email: Info@Broadway-Eng.Com
Cadd. Email: DCorr@Broadway-Eng.Com

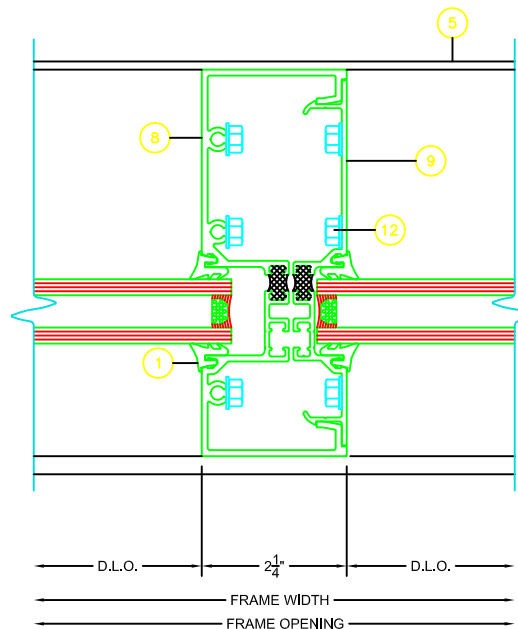
BE-4545 Certificate of Authorization No. 4599

FL600T AAMA TEST DRAWINGS					
FRAMING ELEVATIONS					
PROJECT NO. FL600T					
DRAWN <i>MRG</i>	DATE 10/13/17				
CHECKED <i>WS</i>	APPROVED ###				
SHEET	2 OF 5				

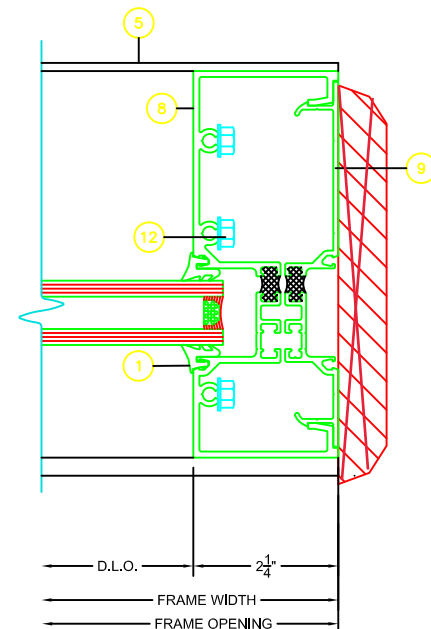
1 3 FL600T HEAD



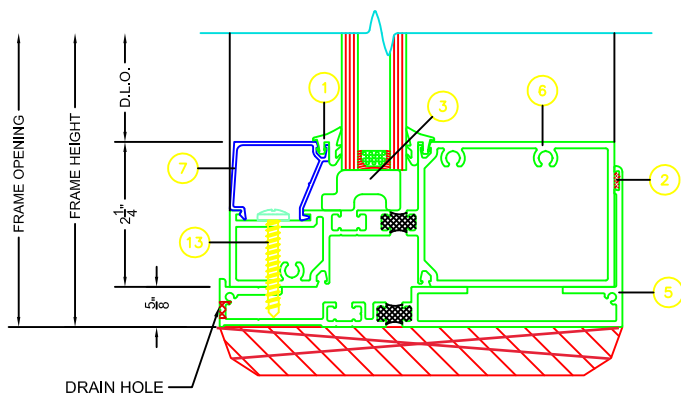
3 3 FL600T VERTICAL



4 3 FL600T JAMB



2 3 FL600T SILL



Tested Sample complies with this detail except where noted
Laboratory Number: 9924
Date: 3/5/18
Initials: MS

Window wall was simulated per NFRC 100 Table 4-3 which states; Window walls shall be tested and simulated with intermediate verticals as jambs and standard head and sill members. The validation unit is not a product that will be found in a real situation. It is required that the intermediate verticals to have glass pockets at jambs replaced with wood block inserts for a validation of the simulated product line.

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FL600T AAMA
TEST DRAWINGS

OPTIONAL FRAMING DETAILS

PROJECT NO. FL600T
DRAWN MRG DATE 10/13/17
CHECKED WS APPROVED ###
SHEET

3 OF 5

BILL OF MATERIALS

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	NOTES
1	NG1	EXTERIOR GLAZING GASKET	0.120 SPACE	EPDM	VARIES	
2	795	SILICONE	FILL SPACE	SILICONE	DOW CORNING	
3	SB3	SETTING BLOCK @ SILL & HORIZONTAL	0.625 X 1.218 X 4.000	EPDM	VARIES	2 PER LITE
4	WD300-1	WATER DIVERTER	1.358 X 1.344 X 4.000	INJECTION MOLDED PLASTIC	CORAL INDUSTRIES, INC.	@ EACH END OF HORIZONTAL
5	FL639T	SUBSILL FLASHING	2.500 X 6.250 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
6	FL626T	SILL	2.500 X 5.969X 0.100	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
7	FL303	GLASS STOP	1.207 X 1.543 X 0.050	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
8	FL634T	STD. VERTICAL MULLION / HEAD	2.500 X 6.000 X 0.093	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
9	FL625T	OPEN BACK MULLION FILLER	0.862 X 5.670 X 0.078	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
11	ED519-1	SILL FLASHING END DAM	2.500 X 1.000 X 0.062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
12	AS16	FASTENER	#14 X 1" HHSTS	STEEL	VARIES	TYP. SPLINE SCREW VERTICAL/HORIZONTAL JOINTS
13	AS56	FASTENER		STEEL	VARIES	ANCHOR (FL626T) TO (FL639T)

GLASS INDEX BY MANUFACTURER	
MARK	DESCRIPTION
(G1)	1" INSULATED UNIT 1/4" TEMPERED LOW E ON SURFACE 2 1/2" AIR SPACE 1/4" CLEAR TEMPERED

Tested Sample complies with this
detail except where noted
Laboratory Number: 9924
Date: 3/5/18
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FL600T AAMA
TEST DRAWINGS

BILL OF MATERIALS

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CHECKED WS	APPROVED ###
SHEET	

4 OF 5

DESCRIPTION

DATE

REV BY

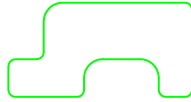
9924-Insulated Glass Unit Bill of Materials

1 EXT. GLAZING GASKET



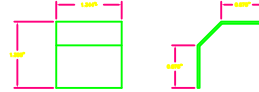
FULL SCALE

3 SETTING BLOCK

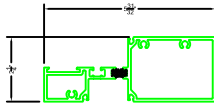
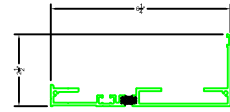


FULL SCALE

4 WATER DRAINER
HALF SCALE



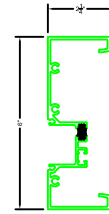
5 SUBSILL



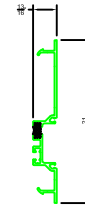
6 SILL



7 GLASS STOP

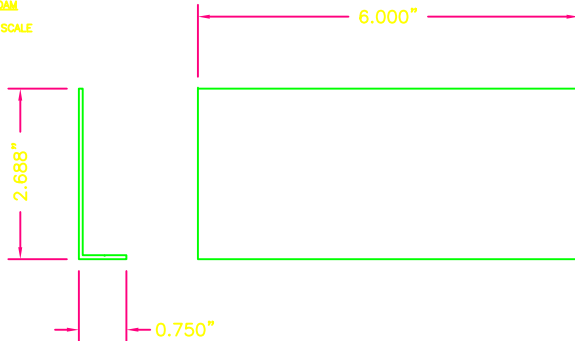


8 VERTICAL MULLION/
HEAD



9 OPEN BACK
MULLION-FILLER

11 END DAM
HALF SCALE



12 AS16



13 AS56

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SHEET

5 OF 5

FL600T AAMA
TEST DRAWINGS

DIE DRAWINGS

DESCRIPTION

DATE

REV

Cardinal® IG

XL Edge Simulation Model



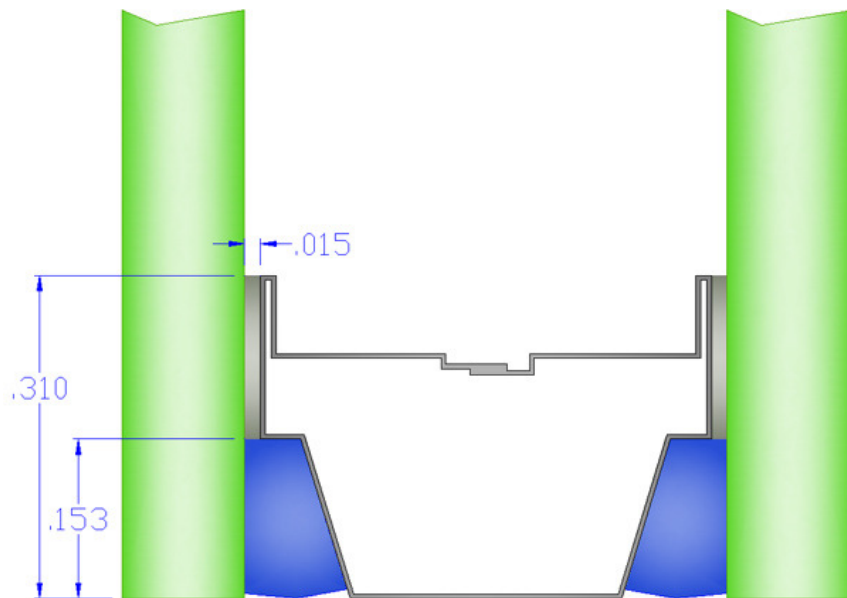
The purpose of this guide is to help properly model the XL Edge seal system when performing Therm window simulations.

XL Edge geometry.

Shown here is the proper XL Edge geometry that should be used for thermal models. This geometry is also included within the attached XL Edge.dxf CAD file.

Some important items are:

- PIB thickness is 0.015".
- Spacer back even with glass edge.
- Stainless steel thickness is 0.0045" for most airspaces.



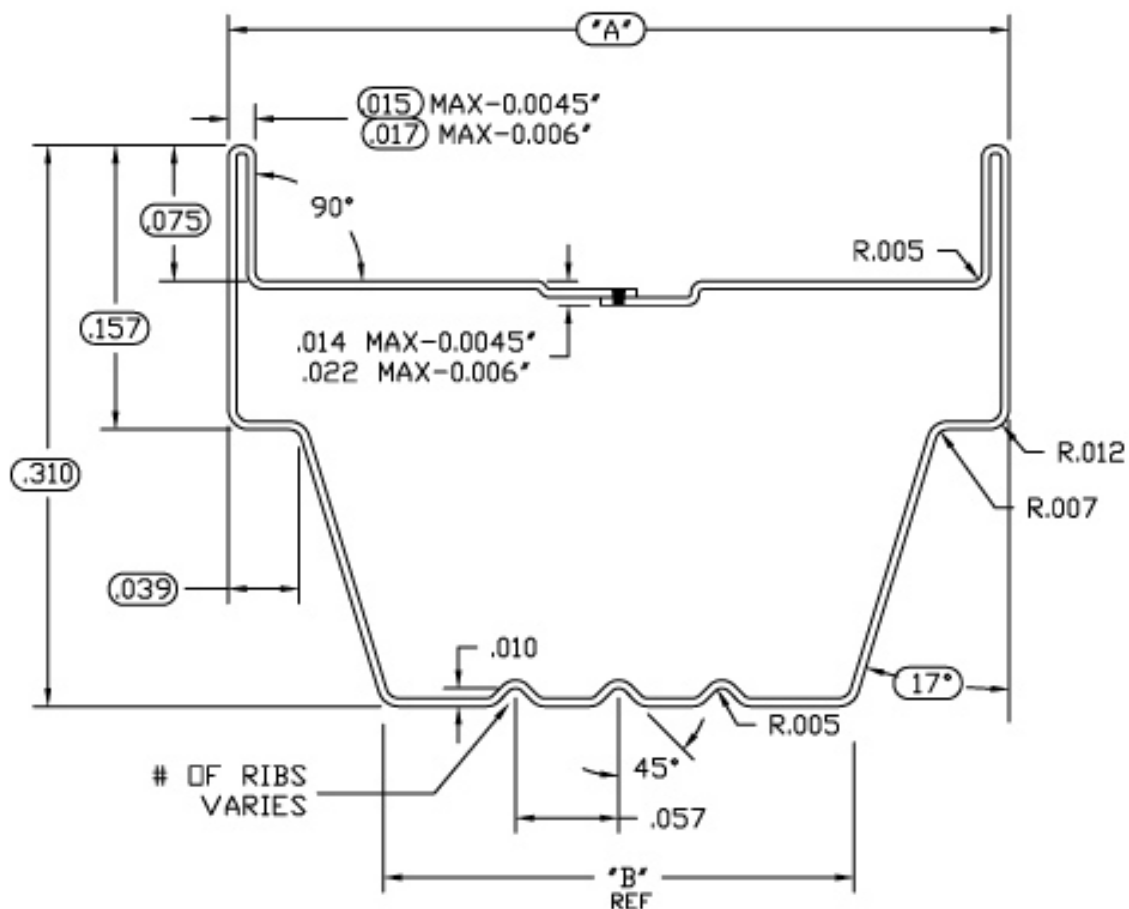
Thermal conductivity

The following thermal conductivity values should be used when modeling XL Edge.

- Silicone: 0.202 BTU/hr-ft-F (0.350 W/m-K)
- PIB: 0.116 BTU/hr-ft-F (0.200 W/m-K)
- Desiccant: 0.017 BTU/hr-ft-F (0.030 W/m-K)
- Stainless Steel: 8.197 BTU/hr-ft-F (14.187 W/m-K)

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SPACER GEOMETRY FOR XL EDGE SIMULATIONS



MATERIAL: 201 STAINLESS STEEL

P/N	NAME	A	B	WALL	# RIBS
58-065	6.5	.236	.064	.0045	1
58-075	7.5	.276	.104	.0045	1
58-080	8.0	.295	.123	.0045	2
58-098	9.8	.366	.194	.0045	3
58-105	10.5	.394	.222	.0045	3
58-112	11.2	.422	.250	.0045	3
58-115	11.5	.432	.260	.0045	3
58-122	12.2	.460	.288	.0045	3
58-130	13.0	.492	.320	.0045	5
57-130	13.0	.492	.320	.006	5
57-145	14.5	.550	.378	.006	5
57-158	15.8	.602	.430	.006	5
57-160	16.0	.610	.438	.006	7
57-165	16.5	.630	.458	.006	7
57-175	17.5	.669	.497	.006	7
57-195	19.5	.748	.576	.006	9
57-210	21.0	.807	.635	.006	9

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CARDINAL IG			
TITLE		FBR SPACERS	
ALL RIGHTS ARE EXPRESSLY RESERVED BY CARDINAL IG	SCALE	DATE	DRAWN BY
	TOLERANCES .XXX±.003	PARTS	APPROV
	ANGULAR±1°		