

# ALUMINTECHNO JLLC THERMAL PERFORMANCE TEST REPORT

**SCOPE OF WORK**

ALTW72 DA

**REPORT NUMBER**

H0034.01-116-46 R0

**TEST DATE**

02/07/18

**ISSUE DATE**

04/13/18

**RECORD RETENTION END DATE**

02/07/23

**PAGES**

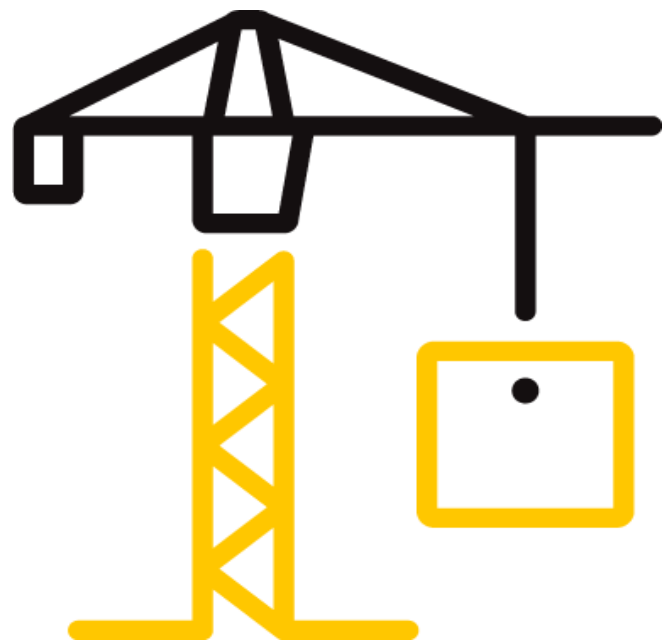
18

**DOCUMENT CONTROL NUMBER**

ATI 00025(a) (07/25/17)

RTTDS-R-AMER-Test-2822(a)

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## TEST REPORT FOR ALUMINTECHNO, JLLC

Report No.: H0034.01-116-46 R0

Date: 04/13/18

### REPORT ISSUED TO

#### ALUMINTECHNO, JLLC

Selitskogo Str.12-211

220075 FEZ "Minsk", Minsk Region, Belarus

### SECTION 1

#### SCOPE

**SERIES/MODEL: ALTW72 DA**

**TYPE: Dual-Action**

Intertek Building & Construction (Intertek B&C) was contracted by ALUMINTECHNO, JLLC to evaluate the thermal performance per NFRC 102-2017. The purpose of this testing was to evaluate the U-Factor performance. Results obtained are tested values and were secured by using the designated test method. Testing was conducted at Intertek B&C test facility in York, Pennsylvania. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

### SECTION 2

#### SUMMARY OF TEST RESULTS

Standardized U-factor (Ust):

0.19 Btu/hr-ft<sup>2</sup>·F (CTS Method)

For INTERTEK B&C:

<b>COMPLETED BY</b>	Ryan P. Moser
<b>TITLE</b>	Senior Technician
<b>SIGNATURE</b>	
<b>DATE</b>	04/13/18

RPM:pan

<b>REVIEWED BY</b>	Shon W. Einsig
<b>TITLE</b>	Technician Team Leader, IIRC
<b>SIGNATURE</b>	
<b>DATE</b>	04/13/18

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**TEST REPORT FOR ALUMINTECHNO, JLLC**

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**SECTION 3**

**TEST SPECIMEN SUMMARY**

<b>SERIES/MODEL</b>	ALTW72 DA
<b>TYPE</b>	Dual-Action
<b>OVERALL SIZE</b>	47-1/4" x 59" (1200 mm x 1499 mm) (Model Size)
<b>NFRC STANDARD SIZE</b>	47.2" x 59.1" (1200 mm wide x 1500 mm high)
<b>TEST SAMPLE SUBMITTED BY</b>	Client

**SECTION 4**

**TEST METHOD**

The specimens were evaluated in accordance with the following:

*NFRC 102-2017, Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems*

**SECTION 5**

**MATERIAL SOURCE/INSTALLATION**

Test samples were provided by ALUMINTECHNO, JLLC. Representative samples of the test specimen will be retained by Intertek B&C for a minimum of five years from the test completion date.

**Test Chamber Installation**

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**

<b>NAME</b>	<b>COMPANY</b>
Ryan P. Moser	Intertek B&C
Shon W. Einsig	Intertek B&C

**TEST REPORT FOR ALUMINTECHNO, JLLC**

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**SECTION 7**

**TEST SAMPLE DESCRIPTION**

**Frame**

<b>MATERIAL</b>	AT (1.04"): Aluminum with Thermal Breaks - All Members		
<b>SIZE</b>	47-1/4" x 59" (Model Size)		
<b>DAYLIGHT OPENING</b>	N/A	<b>GLAZING METHOD</b>	N/A
<b>EXTERIOR COLOR</b>	White	<b>EXTERIOR FINISH</b>	Paint
<b>INTERIOR COLOR</b>	White	<b>INTERIOR FINISH</b>	Paint
<b>CORNER JOINERY</b>	Mitered / Keys & Stakes / Sealed		

**Vent**

<b>MATERIAL</b>	AT (1.04"): Aluminum with Thermal Breaks - All Members		
<b>SIZE</b>	45-5/8" x 57-1/2"		
<b>DAYLIGHT OPENING</b>	40-1/4" x 52"	<b>GLAZING METHOD</b>	Interior
<b>EXTERIOR COLOR</b>	White	<b>EXTERIOR FINISH</b>	Paint
<b>INTERIOR COLOR</b>	White	<b>INTERIOR FINISH</b>	Paint
<b>CORNER JOINERY</b>	Mitered / Keys & Stakes / Sealed		

**Glazing Information**

<b>LAYER 1</b>	5/32"	Planibel TopN+ (e=0.033*, #2)	
<b>GAP 1</b>	0.56"	TS-D: Thermix Thermo-plastic Spacer	90% Argon*
<b>LAYER 2</b>	5/32"	Planibel TopN+ (e=0.033*, #4)	
<b>GAP 2</b>	0.63"	TS-D: Thermix Thermo-plastic Spacer	90% Argon*
<b>LAYER 3</b>	5/32"	Planibel TopN+ (e=0.033*, #5)	
<b>GAP 3</b>	0.56"	TS-D: Thermix Thermo-plastic Spacer	90% Argon*
<b>LAYER 4</b>	5/32"	Planibel TopN+ (e=0.033*, #7)	
<b>GAS FILL METHOD</b>	Single-Probe Method*		

*\*Stated per Client/Manufacturer*

*N/A Non-Applicable*

**TEST REPORT FOR ALUMINTECHNO, JLLC**

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**SECTION 7 (CONTINUED)**

**TEST SAMPLE DESCRIPTION (CONTINUED)**

**Weatherstripping**

DESCRIPTION	QUANTITY	LOCATION
Center gasket	1 row	Frame perimeter
Single-fin gasket	1 row	Vent perimeter
Preset gasket	1 row	Exterior glazing perimeter
Wedge gasket	1 row	Interior glazing perimeter

**Hardware**

DESCRIPTION	QUANTITY	LOCATION
Dual action lock assembly	1	Lock stile
Metal keeper	7	Three per lock jamb, two per sill, one per head and hinge jamb
Metal hinges	2	Hinge jamb/stile
Aluminum water shed	1	Bottom rail
Single-arm hinge	1	Head/top rail

**Drainage**

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weepslot	0.63" x 0.13"	2	Bottom rail
Weepslot	1.00" x 0.25"	3	Sill face

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**SECTION 8**

**THERMAL TRANSMITTANCE (U-FACTOR): MEASURED TEST DATA**

**Heat Flows**

1. Total Measured Input into Metering Box (Qtotal)	334.44 Btu/hr
2. Surround Panel Heat Flow (Qsp)	52.04 Btu/hr
3. Surround Panel Thickness	4.00 inches
4. Surround Panel Conductance	0.0472 Btu/hr-ft <sup>2</sup> -F
5. Metering Box Wall Heat Flow (Qmb)	1.49 Btu/hr
6. EMF vs Heat Flow Equation (equivalent information)	0.0117*EMF + 0.001
7. Flanking Loss Heat Flow (Qfl)	16.03 Btu/hr
8. Net Specimen Heat Loss (Qs)	264.88 Btu/hr

**Areas**

1. Test Specimen Projected Area (As)	19.36 ft <sup>2</sup>
2. Test Specimen Interior Total (3-D) Surface Area (Ah)	20.44 ft <sup>2</sup>
3. Test Specimen Exterior Total (3-D) Surface Area (Ac)	20.53 ft <sup>2</sup>
4. Metering Box Opening Area (Amb)	36.11 ft <sup>2</sup>
5. Metering Box Baffle Area (Ab1)	33.94 ft <sup>2</sup>
6. Surround Panel Interior Exposed Area (Asp)	16.75 ft <sup>2</sup>

**Test Conditions**

1. Average Metering Room Air Temperature (th)	69.80 F
2. Average Cold Side Air Temperature (tc)	-0.39 F
3. Average Guard/Environmental Air Temperature	71.25 F
4. Metering Room Average Relative Humidity	14.02 %
5. Metering Room Maximum Relative Humidity	14.41 %
6. Metering Room Minimum Relative Humidity	13.64 %
7. Measured Cold Side Wind Velocity (Perpendicular Flow)	12.66 mph
8. Measured Warm Side Wind Velocity (Parallel Flow)	N/A mph
9. Measured Static Pressure Difference Across Test Specimen	0.00" ± 0.04" H <sub>2</sub> O

**Average Surface Temperatures**

1. Metering Room Surround Panel	66.17 F
2. Cold Side Surround Panel	0.34 F

**Results**

1. Thermal Transmittance of Test Specimen (Us)	0.19 Btu/hr-ft <sup>2</sup> -F
2. Standardized Thermal Transmittance of Test Specimen (Ust)	0.19 Btu/hr-ft <sup>2</sup> -F

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**SECTION 9**

**THERMAL TRANSMITTANCE (U-FACTOR): CALCULATED TEST DATA**

**CTS Method Results**

1. Warm Side Emittance of Glass (e1)	0.84
2. Cold Side Emittance of Glass	0.84
3. Warm Side Frame Emittance*	0.90
4. Cold Side Frame Emittance*	0.90
5. Warm Side Sash/Panel/Vent Emittance*	0.90
6. Cold Side Sash/Panel/Vent Emittance*	0.90
7. Warm Side Baffle Emittance (eb1)	0.92
8. Cold Side Baffle Emittance (eb2)	N/A
9. Equivalent Warm Side Surface Temperature (t1)	59.73 F
10. Equivalent Cold Side Surface Temperature (t2)	2.20 F
11. Warm Side Baffle Surface Temperature	69.22 F
12. Cold Side Baffle Surface Temperature	N/A F
13. Measured Warm Side Surface Conductance (hh)	1.36 Btu/hr·ft <sup>2</sup> ·F
14. Measured Cold Side Surface Conductance (hc)	5.29 Btu/hr·ft <sup>2</sup> ·F
15. Test Specimen Thermal Conductance (Cs)	0.24 Btu/hr·ft <sup>2</sup> ·F
16. Convection Coefficient (Kc)	0.36 Btu/(hr·ft <sup>2</sup> ·F <sup>1.25</sup> )
17. Radiative Test Specimen Heat Flow (Qr1)	141.73 Btu/hr
18. Conductive Test Specimen Heat Flow (Qc1)	123.15 Btu/hr
19. Radiative Heat Flux of Test Specimen (qr1)	7.32 Btu/hr·ft <sup>2</sup> ·F
20. Convective Heat Flux of Test Specimen (qc1)	6.36 Btu/hr·ft <sup>2</sup> ·F
21. Standardized Warm Side Surface Conductance (hsth)	1.19 Btu/hr·ft <sup>2</sup> ·F
22. Standardized Cold Side Surface Conductance (hstc)	5.28 Btu/hr·ft <sup>2</sup> ·F
23. Standardized Thermal Transmittance (Ust)	0.19 Btu/hr·ft <sup>2</sup> ·F

\*Stated per NFRC 101

**SECTION 10**

**TEST DURATION**

1. The environmental systems were started at 10:40 hours, 02/06/18.
2. The test parameters were considered stable for two consecutive four hour test periods from 22:15 hours, 02/06/18 to 06:15 hours, 02/07/18.
3. The thermal performance test results were derived from 02:15 hours, 02/07/18 to 06:15 hours, 02/07/18.

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**SECTION 11**

**GLAZING DEFLECTION**

	<b>VENT EXT. / INT.</b>
<b>EDGE GAP WIDTH</b>	0.56" / 0.63"
<b>ESTIMATED CENTER GAP WIDTH</b> upon receipt of specimen in laboratory (after stabilization)	0.59" / 0.66"
<b>CENTER GAP WIDTH</b> at laboratory ambient conditions on day of testing	0.59" / 0.66"
<b>CENTER GAP WIDTH</b> at test conditions	0.50" / 0.53"

*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 000001) in York, Pennsylvania were last conducted in May 2017 in accordance with Intertek B&C calibration procedure. A CTS Calibration verification was performed May 2017. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed September 2017.

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



**TEST REPORT FOR ALUMINTECHNO, JLLC**

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**SECTION 12**

**CTS CALIBRATION DATA**

1. CTS Test Date	05/03/17
2. CTS Size	21.53 ft <sup>2</sup>
3. CTS Glass/Core Conductance	0.42 Btu/hr·ft <sup>2</sup> ·F
4. Warm Side Air Temperature	69.80 F
5. Cold Side Air Temperature	-0.41 F
6. Warm Side Average Surface Temperature	54.41 F
7. Cold Side Average Surface Temperature	3.67 F
8. Convection Coefficient (Kc)	0.36 Btu/(hr·ft <sup>2</sup> ·F <sup>1.25</sup> )
9. Measured Cold Side Surface Conductance (hc)	5.29 Btu/hr·ft <sup>2</sup> ·F
10. Measured Thermal Transmittance	0.31 Btu/hr·ft <sup>2</sup> ·F

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 2.63%.

"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 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.

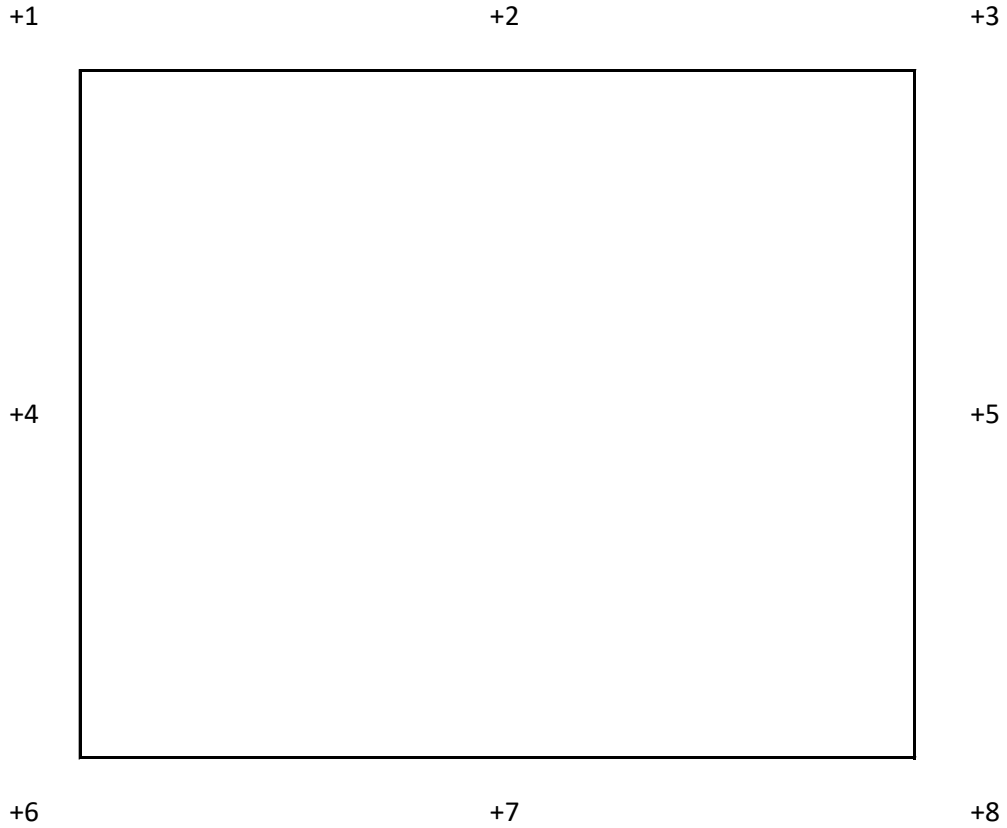
**TEST REPORT FOR ALUMINTECHNO, JLLC**

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**SECTION 13**

**SURROUND PANEL WIRING DIAGRAM**



**TEST REPORT FOR ALUMINTECHNO, JLLC**

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**SECTION 14**

**BAFFLE WIRING DIAGRAM**



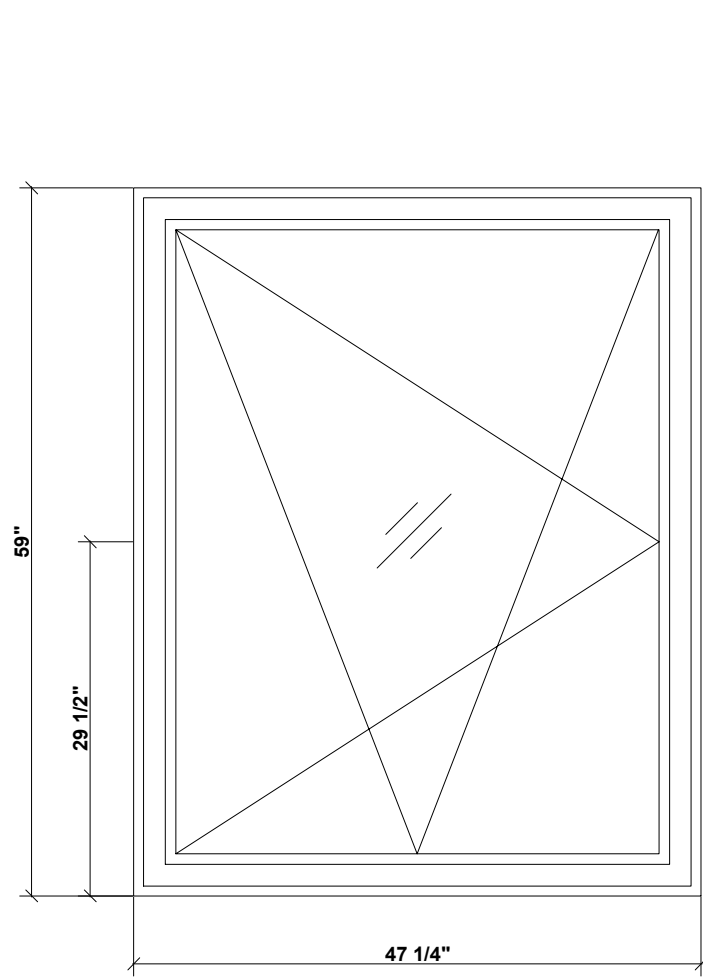
**TEST REPORT FOR ALUMINTECHNO, JLLC**

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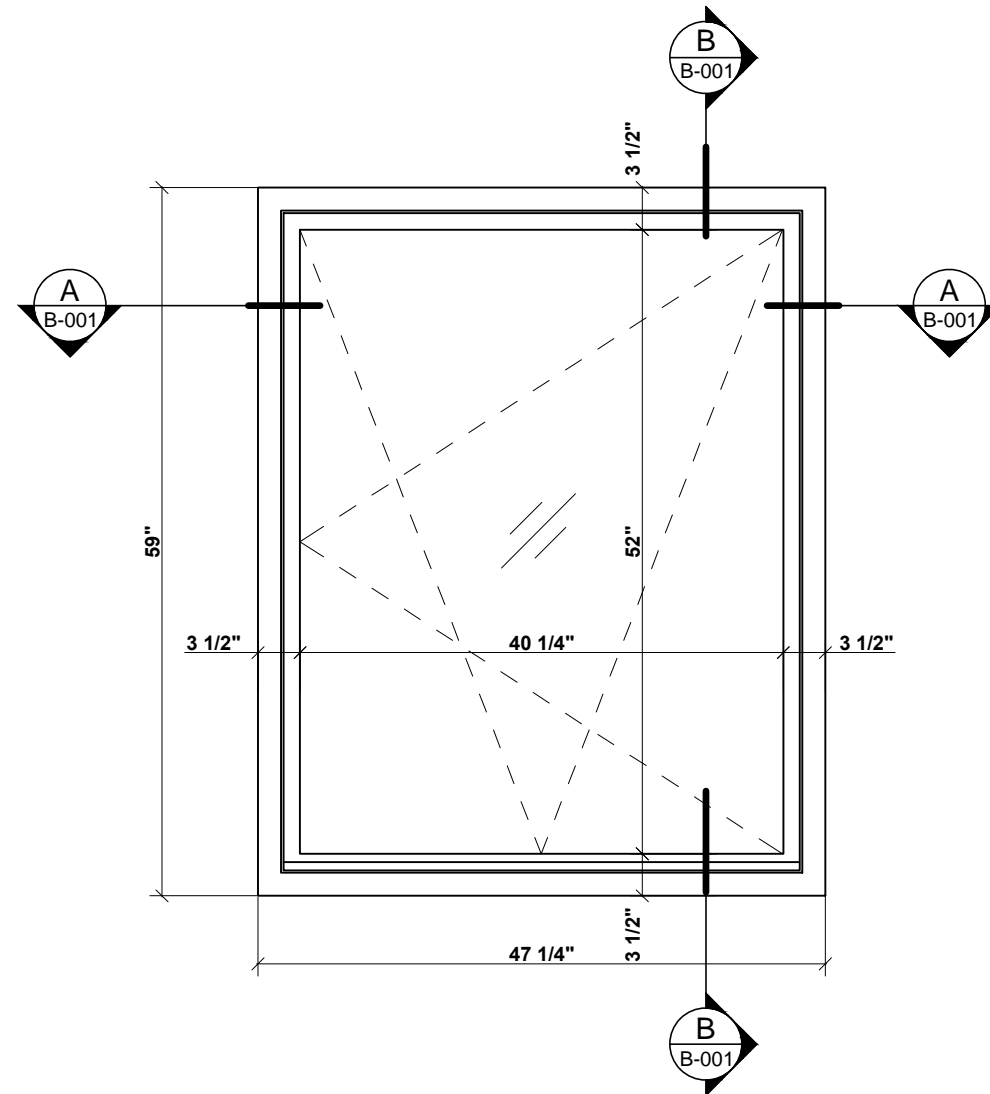
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**SECTION 15**  
**DRAWINGS**

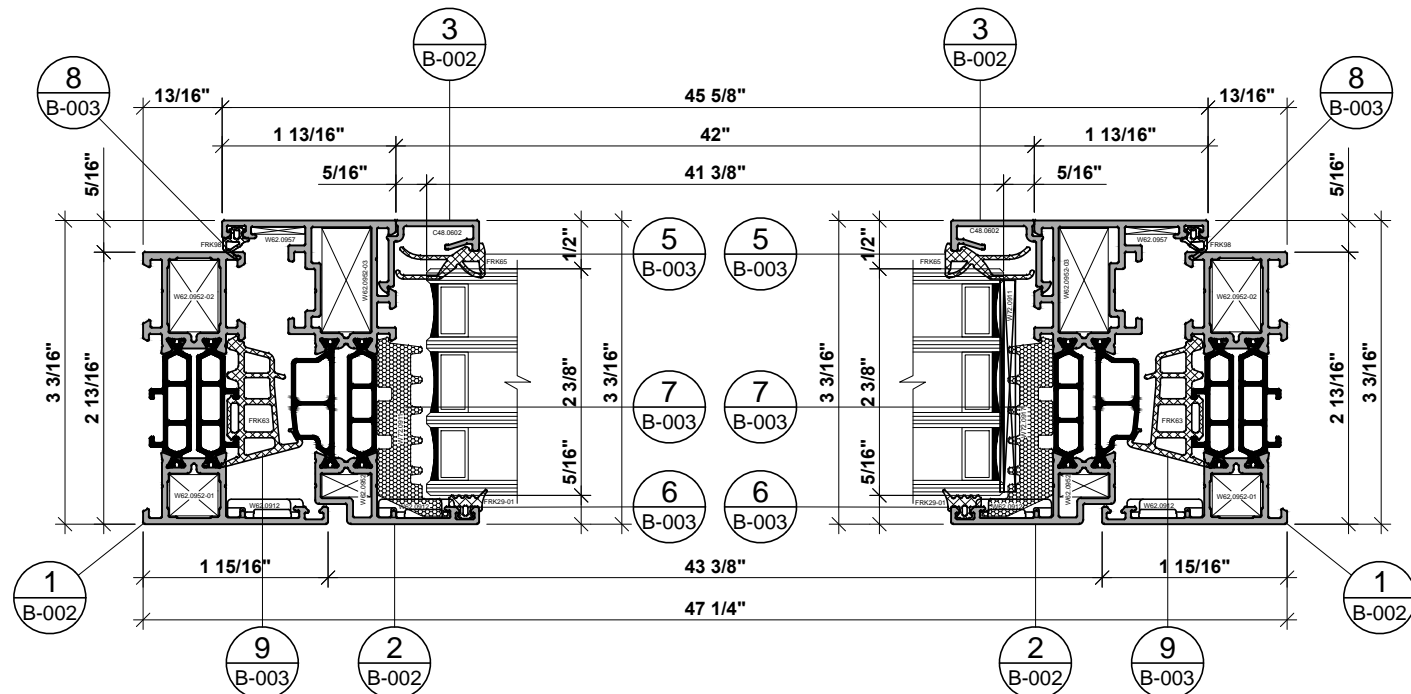
The test specimen drawings which follow have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.



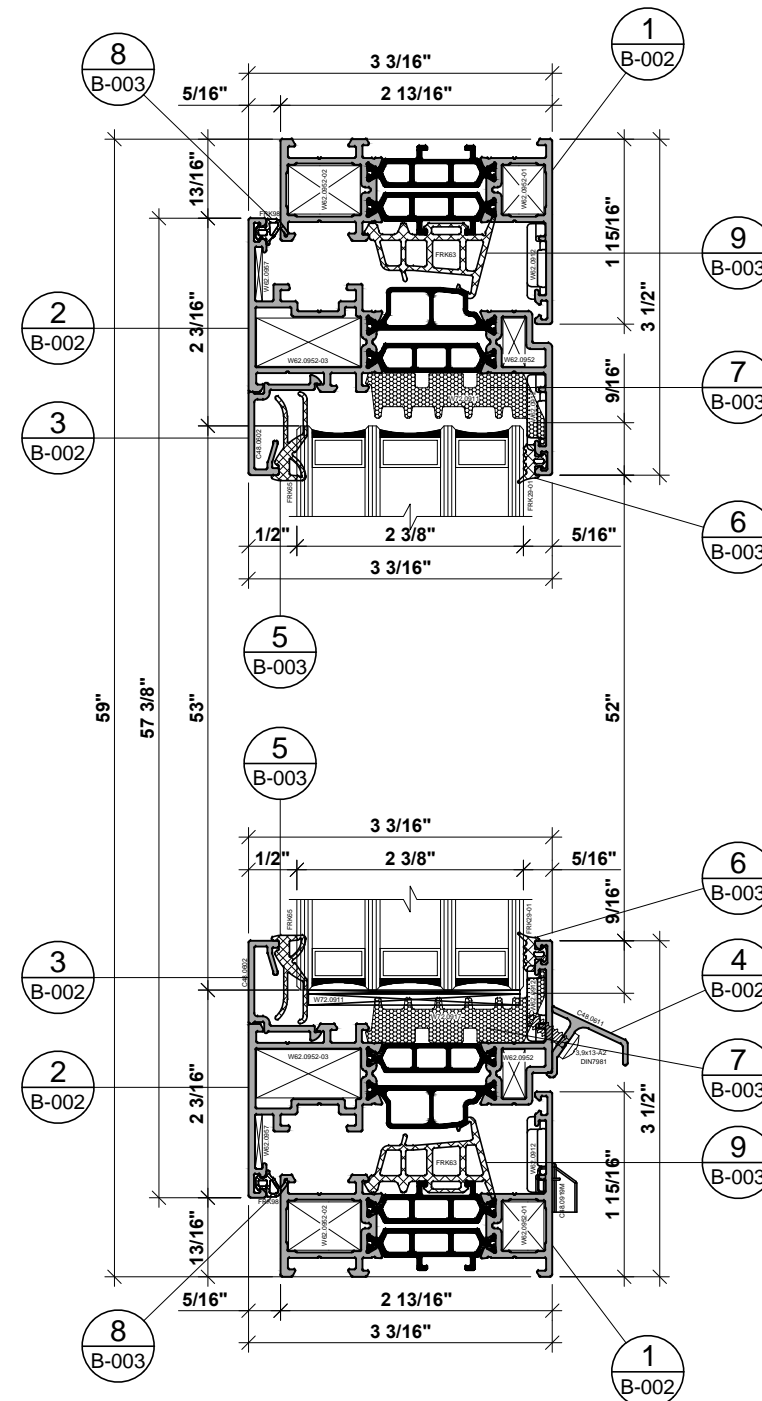
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INTERIOR VIEW  
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2 WINDOW ELEVATION  
EXTERIOR VIEW  
SCALE: 3/4" = 1'-0"



3 SECTION A-A  
SCALE: 6" = 1'-0"



4 SECTION B-B  
SCALE: 6" = 1'-0"

**intertek** Report #: H0034-116-46  
Total Quality. Assured. Date: 02/07/2018  
Verified by: *Ryan P. Moser*



**THERMAL PERFORMANCE TEST**  
130 Derry Court York, PA 17406 Intertek

DATE	REVISION	#

**APPROVED**

CLIENT'S SIGNATURE \_\_\_\_\_

DATE: \_\_\_/\_\_\_/\_\_\_

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NOTE: \_\_\_\_\_

DIMENSIONS FIELD VERIFIED

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

NOTE: \_\_\_\_\_

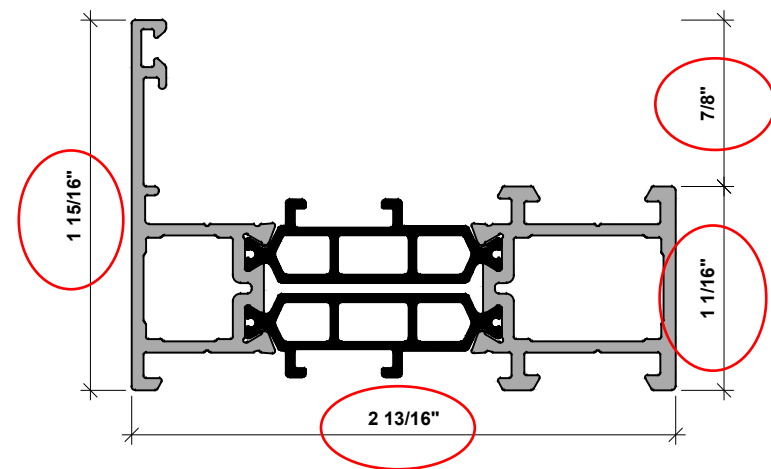
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CHECKED BY: AA

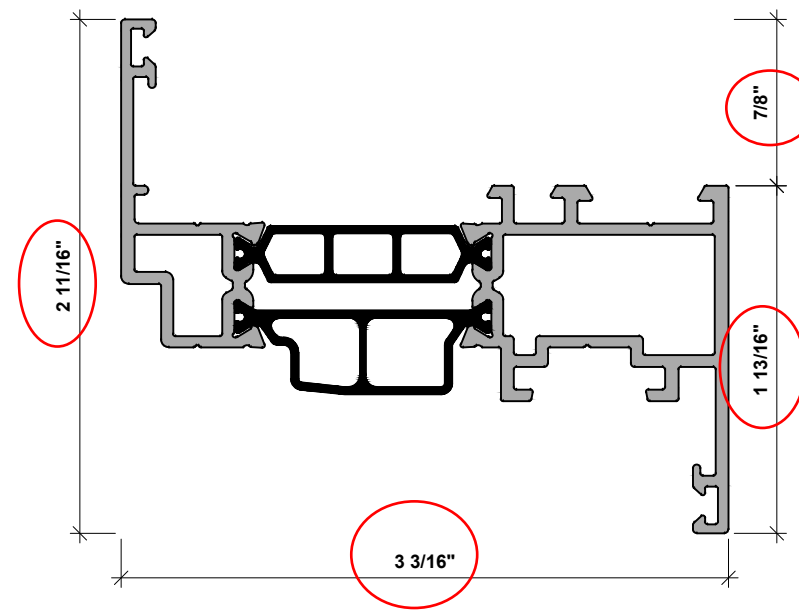
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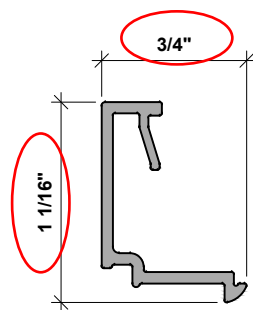
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1 HEAD, SILL, SIDE JAMBS MOLDING EXTRUSION W72.0101E  
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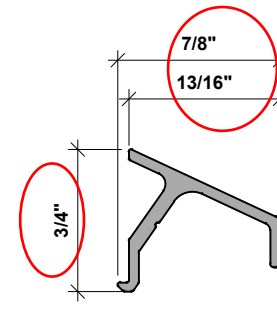
Material: Extruded Aluminum with Thermal Break

2 SASH MOLDING EXTRUSION W72.0221E  
SCALE: 1'-0" = 1'-0"



Material: Extruded Aluminum

3 GLAZING BEAD EXTRUSION C48.0602  
SCALE: 1'-0" = 1'-0"



Material: Extruded Aluminum

4 WATER DEFLECTOR EXTRUSION C48.0611  
SCALE: 1'-0" = 1'-0"

	Report #:	H0034-116-46
	Date:	02/07/2018
	Verified by:	<i>Ryan G. Moser</i>

CLIENT:  
**AluminTechno**  
ALUMINUM PROFILE SYSTEMS

ARCHITECT:

PREPARED BY:  
**CAD**  
SHOPS

PROJECT ADDRESS:  
**THERMAL PERFORMANCE TEST**  
 130 Derry Court York, PA 17406 Intertek

DATE	REVISION	#

**APPROVED**  
 CLIENT'S SIGNATURE \_\_\_\_\_  
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**INDIVIDUAL FRAME AND SASH COMPONENTS SECTIONS**

**REVIEWED BY PROJECT MANAGER**  
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**DIMENSIONS FIELD VERIFIED**  
 BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 NOTE: \_\_\_\_\_

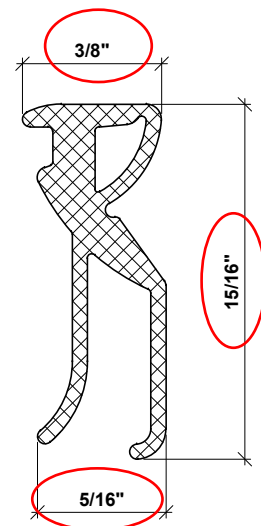
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**DRAWN BY: MK**

**CHECKED BY: AA**

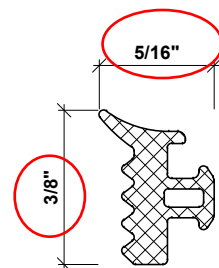
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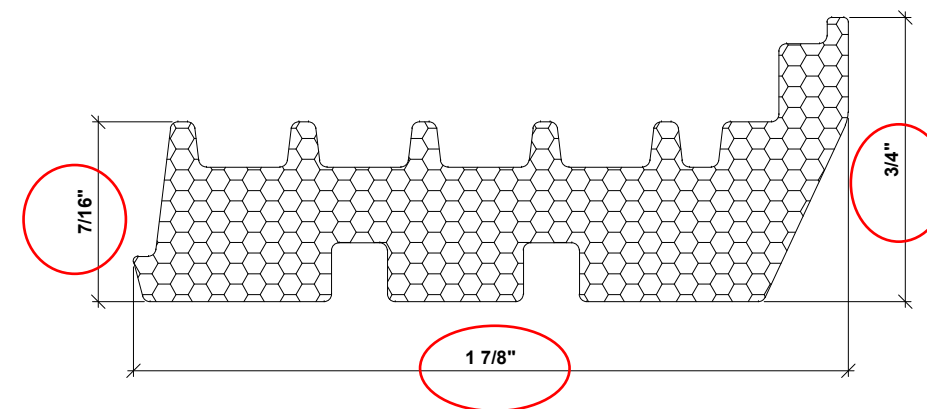
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5 INTERIOR GASKET FRK65  
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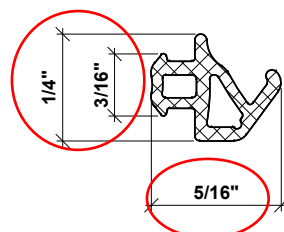
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6 EXTERIOR GASKET FRK29-01  
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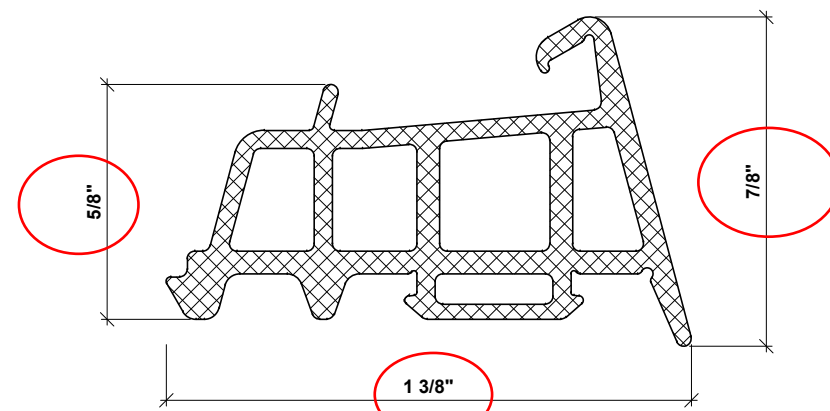
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7 FOAM INSULATION W72.0911  
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Material: Rubber

8 INTERIOR GASKET FRK98  
SCALE: 2'-0" = 1'-0"



Material: Rubber

9 FRAME GASKET FRK63  
SCALE: 2'-0" = 1'-0"

**intertek**  
Total Quality. Assured.

Report #: H0034-116-46  
Date: 02/07/2018  
Verified by: *Bryan G. Moser*

DATE	REVISION	#

**APPROVED**

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**INDIVIDUAL FRAME AND SASH COMPONENTS SECTIONS**

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NOTE: \_\_\_\_\_

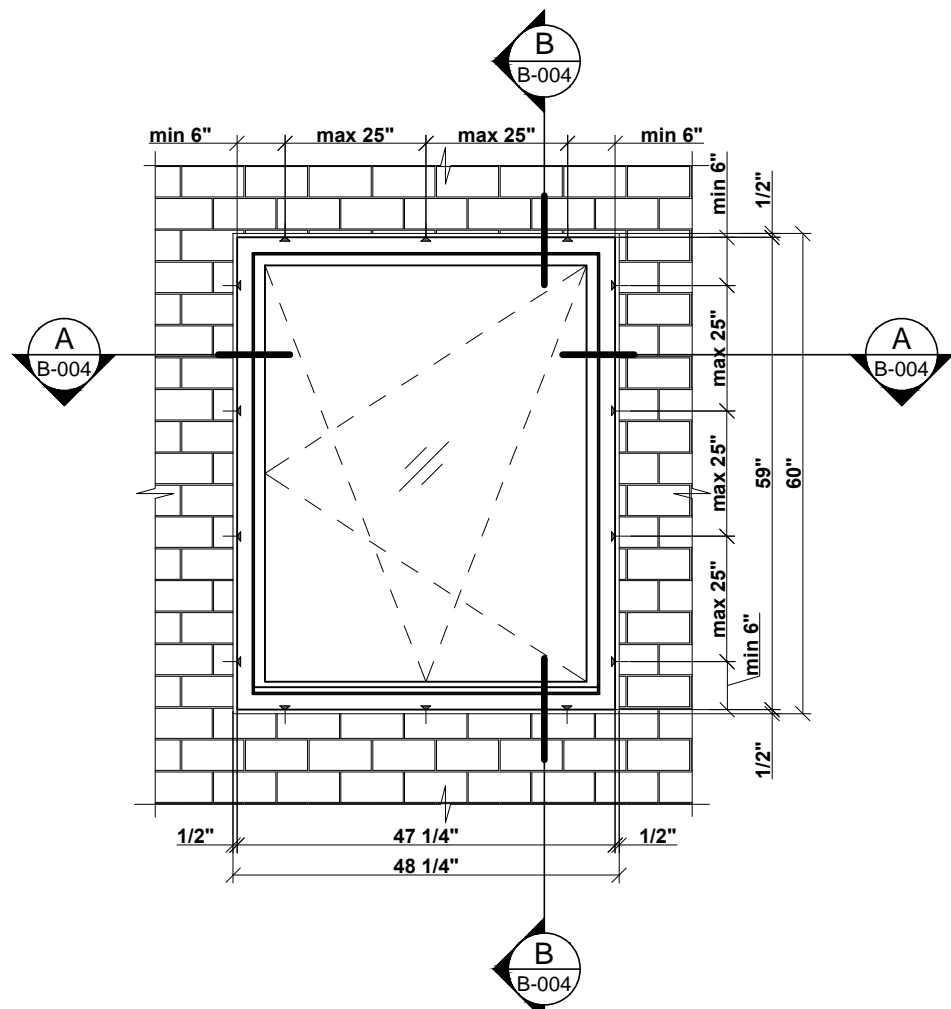
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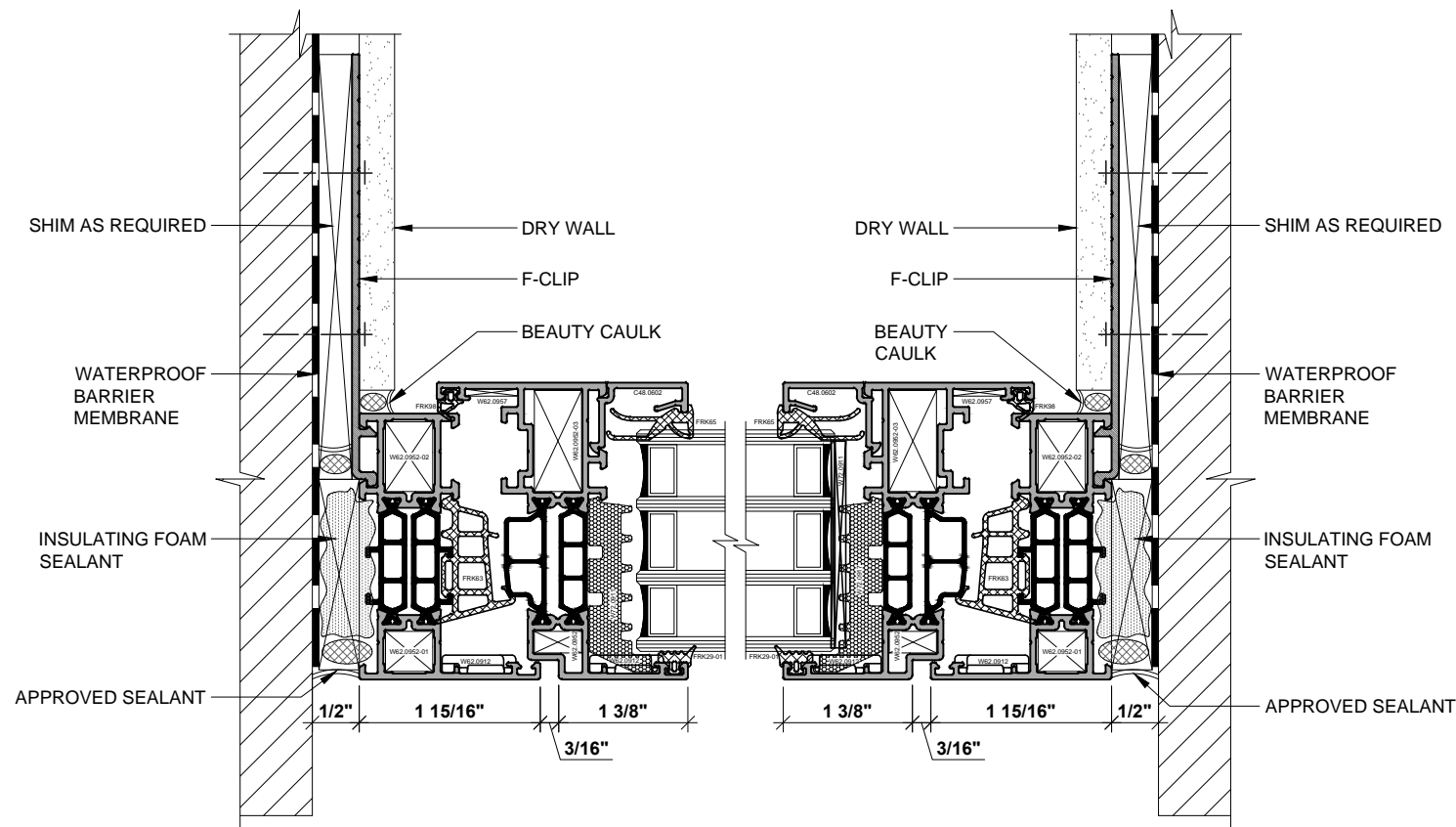
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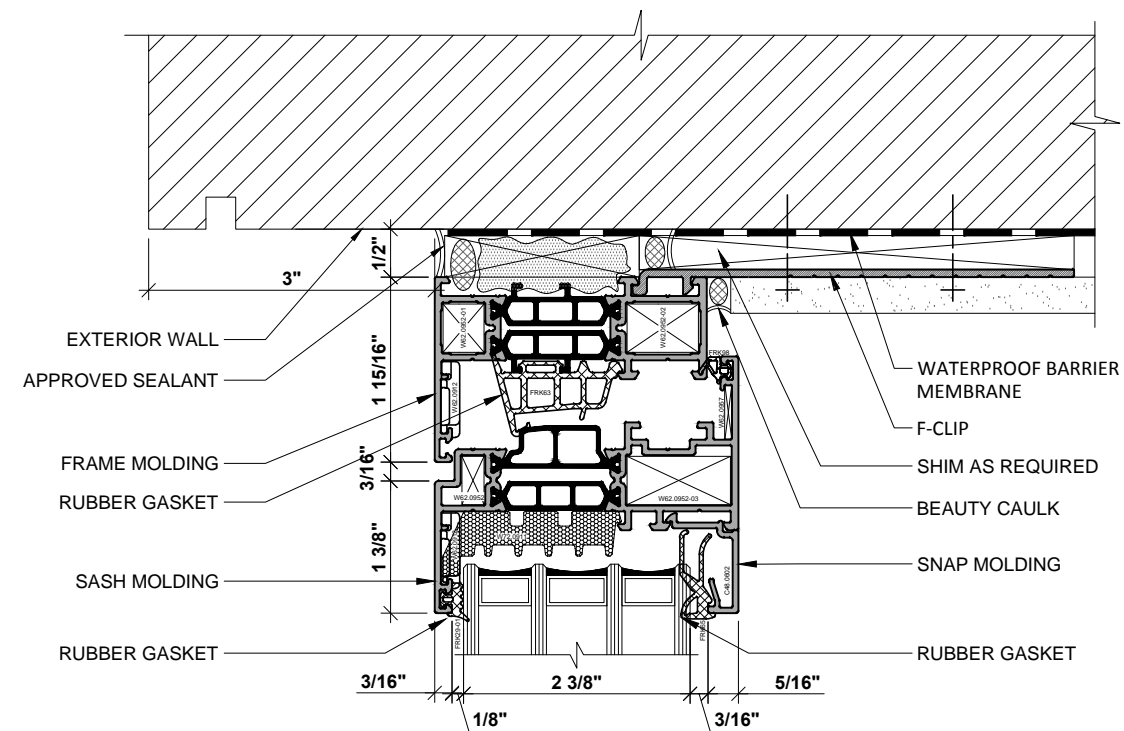
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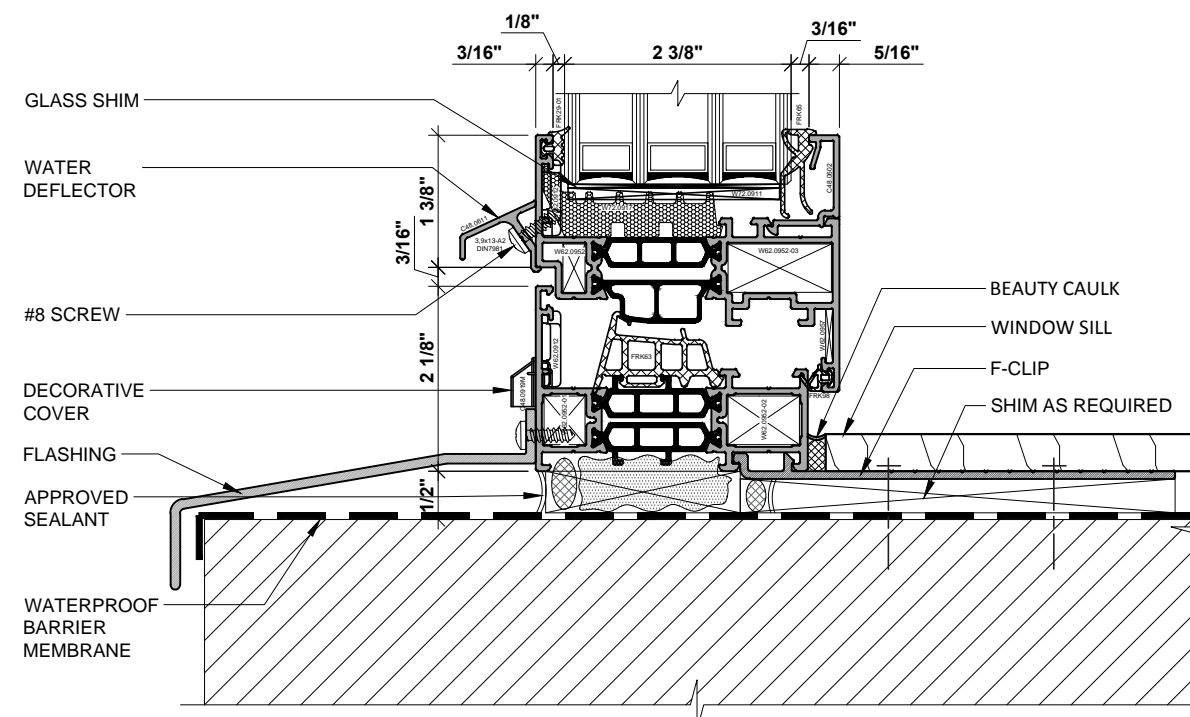
◀ - STEEL ANCHORING



2 SECTION A-A  
SCALE: 6" = 1'-0"



3 SECTION B-B  
SCALE: 6" = 1'-0"



**intertek** Report #: H0034-116-46  
Date: 02/07/2018  
Verified by: *Ryan P. Moser*



**THERMAL PERFORMANCE TEST**  
130 Derry Court York, PA 17406 Intertek

DATE	REVISION	#

APPROVED

CLIENT'S SIGNATURE \_\_\_\_\_

DATE: / /

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DO NOT SCALE DRAWINGS  
ALL DIMENSIONS TO BE FIELD VERIFIED PRIOR TO ANY FABRICATION.

DRAWING TITLE:

**WINDOW EXTRUSIONS**

REVIEWED BY PROJECT MANAGER

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

NOTE: \_\_\_\_\_

DIMENSIONS FIELD VERIFIED

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

NOTE: \_\_\_\_\_

DATE: 02.02.2018

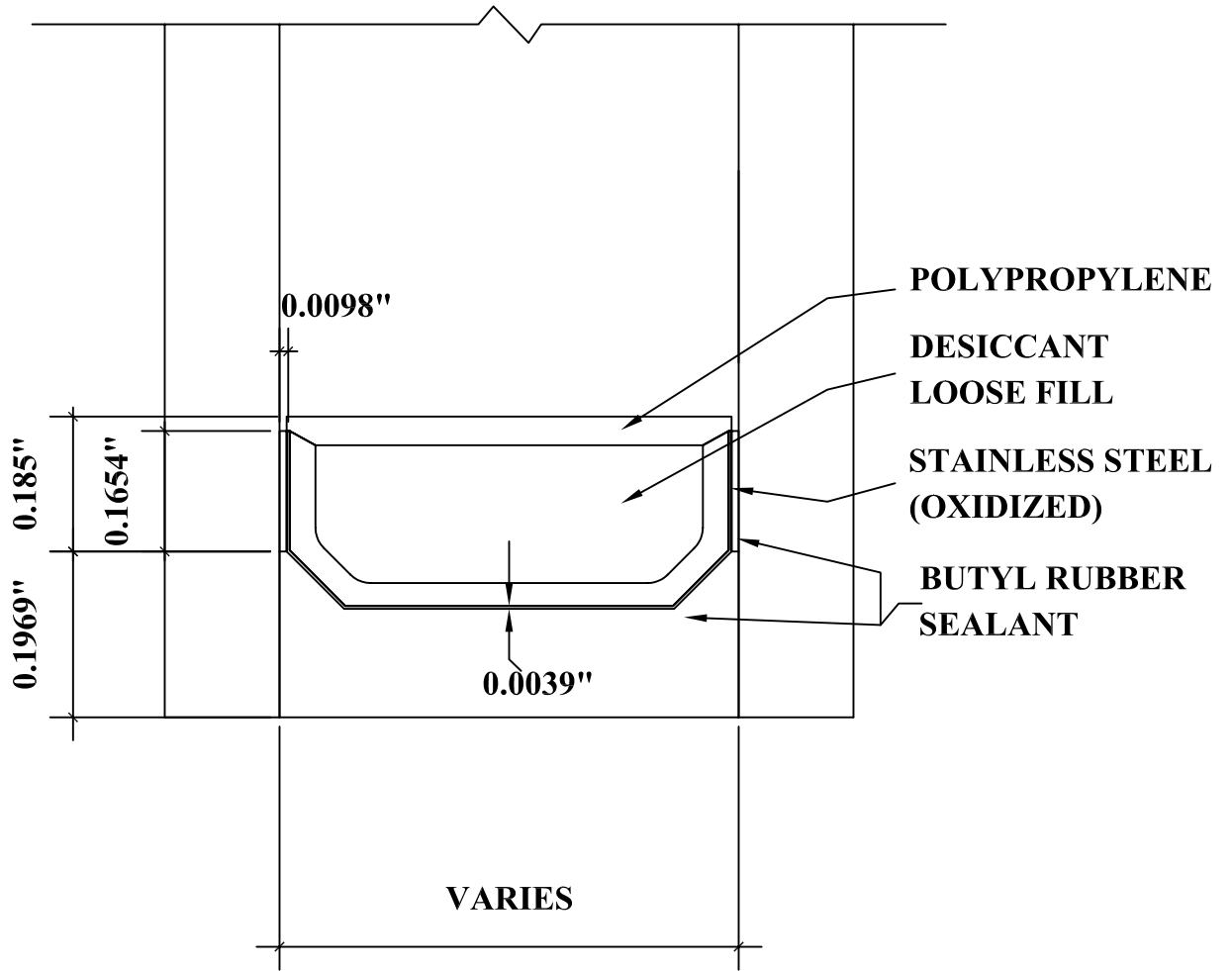
DRAWN BY: MK

CHECKED BY: AA

DRAWING No: \_\_\_\_\_ SIZE: B

**B-004.00**





DETAIL FOR THERMAL MODELING OF  
ENSINGER THERMIX TX.N SPACER (TS-D)

**TEST REPORT FOR ALUMINTECHNO, JLLC**

Report No.: H0034.01-116-46 R0

Date: 04/13/18

**SECTION 16**

**REVISION LOG**

REVISION #	DATE	PAGES	REVISION
.01 R0	04/13/18	N/A	Original Report Issue