NATIONAL CERTIFIED TESTING LABORATORIES
FIVE LEIGH DRIVE • YORK, PENNSYLVANIA 17406 • TELEPHONE (717) 846-1200
FAX (717) 767-4100
www.nctlinc.com

ALL SEASONS WINDOW & DOOR MANUFACTURING, INC.
NFRC THERMAL TEST SUMMARY REPORT Report No: NCTL-110-21540-1S

Test Specimen		NFRC Code
Manufacturer:	All Seasons Window & Door Manufacturing, Inc.	
Series/Model:	Series "EU 400"	
Window Type:	Dual Action -Tilt Turn	DATT
Frame Composition:	Aluminum w/ Thermal Breaks - All Members	AT
Vent Composition:	Aluminum w/ Thermal Breaks - All Members	AT
Thermal Break Mat'l:	Polyamide	P
Overall Size:	600 mm (23.625") wide by 1499 mm (59") high (Non-Standard Size)	
Glazing Description	1.20" Overall w/ Low E and Argon	
No. of Glazing Layers (including films):	2	2
Primary Glazing:	Double Glazed	DG
Spacer Type:	Aluminum	A1-D
Gap Fill 1:	Argon (90% Single Probe)	ARG
Gap Fill 2:	Not Applicable	
Glass/Film Thicknesses (ext to int):	0.190", 0.190"	
Air Gap 1:	0.788"	
Air Gap 2:	Not Applicable	
Secondary Glazing:	Not Applicable	
Low Emissivity Coatings:		
Surface 2:	0.018	

Procedure: Standardized Thermal Transmittance (U_{st}) was determined using the NFRC 102-2017 procedure with a temperature of 69.8°± 0.5°F on the room side of the specimen and -0.4°± 0.5°F on the weather side of specimen. The net air leakage across the test specimen was 0.0 cfm.

Test Results: Results of the test period 1537-21937 on 10/29/18 using the Equivalent CTS Method:

Thermal transmittance at test conditions (U_s):	0.39	BTU/hr/ft^2/°F
Standardized thermal transmittance of test specimen (U_{st}):	**0.37**	**BTU/hr/ft^2/°F**

Reference should be made to Thermal Performance Test Report Number NCTL-110-21540-1 for complete specimen description and test data.

National Certified Testing Laboratories

Performed By:

Bryce Peters
Technician

Reviewed By:

Raymond W. Lamb, PE
Person In Responsible Charge

Report Number	NCTL-110-21540-1
Report Date	11/27/2018
Report To	All Seasons Window & Door Manufacturing, Inc. 1340 Metropolitan Avenue Brooklyn, NY 11237
Test Start Date **Test End Date**	10/28/2018 10/30/2018
Specification	NFRC 102-2017 "Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems"

Description of Sample Tested

Note: All dimensions are in the order (Width x Height x Thickness) unless otherwise noted.

Model/ Series	"EU 400"
Configuration	Casement
Frame Size	Overall 600 mm x 1499 mm (23.625" x 59") (Non-Standard Size)
Vent Size	546 mm x 1448 mm (21.5" x 57")
Viewing Area	403 mm x 1302 mm (15.875" x 51.25")
Frame & Vent Type	Extruded aluminum with polyamide thermal breaks
Joint Construction	Frame & Vent Mitered with staked-in-place corner keys
Glazing Components	
Overall	30 mm (1.20") Nominal
Glass Thickness	(2) Lites of 5 mm (0.190") tempered glass
Coating	A Vitro formerly PPG "Solarban 70XL" sputter-type low emissivity coating (e=0.018 per client) was applied to glazing surface no. 2.
Spacer Type/ Size	20.02 mm (0.788") Aluminum spacer (Type A1-D)
Fill	Argon 90% single probe per client
Glazing System	Interior glazed with a flexible vinyl gasket back-bedding and a snap-in aluminum glazing bead with flexible vinyl gasket
Weatherstrip	
Type	(1) Strip single-leaf flexible vinyl
Location	Frame and vent perimeter
Type	(1) Strip gooseneck flexible vinyl/EPDM
Location	Frame perimeter

Operating Hardware

Locks	
Type	Single handle (6)-point integrated lock system
Location	737 mm (29”) From bottom of the lock stile with (4) lock points at the lock stile and (1) at the head and sill
Keeper	
Type	Metal
Location	Corresponding lock locations on the frame
Hinge Hardware	
Type	(3)-Bar metal
Location	Each end of the hinge stile

Auxiliary

Type	Urethane foam
Location	(3) Largest cavities in frame
Type	Urethane foam
Location	Interior/ exterior most cavities in vent
Type	Urethane foam
Location	(3) Thermal break cavities in vent
Type	Foam insert
Location	Glazing bead

Reinforcement No reinforcement employed

Weep Description No apparent weeps employed

Interior/ Exterior Surface Finish Clear anodized aluminum

Sealant

Location	Corners of vent and frame
Material	Silicone

Insect Screen No screen employed

Nail Fin Not applicable/ No nail fin

SPECIMEN PREPARATION PRIOR TO TEST

The test specimen was pre-conditioned at ambient laboratory conditions prior to the test. The surround panel-to-specimen interfaces were sealed with a non-reflective tape. The specimen was sealed on the interior with a caulk sealant resulting in a measured net air leakage of 0.0 cfm per square foot.

TEST PARAMETERS

Tests to determine the Standardized Thermal Transmittance (U_{st}) of the specimen were performed in the guarded hot box apparatus located at the York, PA facility. The most recent calibration of the hot box apparatus was April 02, 2018. The thermal performance evaluations were completed in accordance with the NFRC 102 procedure using a dynamic wind perpendicular to the specimen on the weather side and simulated natural convection on the room side. A zero static pressure differential (0.00" ± 0.04" H_2O) was maintained across the specimen during the test by pressurizing the metering box on the room side. Data was collected over (2) successive (2) hour periods after (4) hours of steady state conditions as defined in section 6.1.2 of the NFRC 102 procedure were achieved. The test was considered completed when the data of the successive (2) hour periods also satisfied the criteria defined in section 6.1.2 of the NFRC 102 procedure.

GLASS THICKNESS AND GLAZING DEFLECTION:

	Glass Thickness	Glazing Deflection Before Test	Glazing Deflection After Test
Vent:	0.190”, 0.190”	0.02”	0.106”

PROJECTED FRAME DIMENSIONS OF MEMBERS:

Member:	Head	Left Jamb	Right Jamb	Sill
Dimension:	3.875”	3.875”	3.875”	3.875”

TEST DURATION:

The test chamber environmental systems were initiated at 1343 on 10/28/18. The test conditions were considered stable for (2) consecutive (2) hour test periods from 1537-1737 and 1737-1937 on 10/29/18. The thermal performance test results were derived from the 1537-1937 test period.

Areas:

Test Specimen Projected Area (A_s):	9.68	ft²
Test Specimen Interior Exposed (Wetted) Surface Area (A_{int}):	96.38	ft²
Test Specimen Exterior Exposed (Wetted) Surface Area (A_{ext}):	11.5	ft²
Metering Box Opening Area (A_{mb}):	54.39	ft²
Metering Box Baffle Area (A_{b1}):	46.44	ft²
Surround Panel Interior Exposed Area (A_{sp}):	47.71	ft²

Test Conditions:

Average Room Side Air Temperature (t_h):	69.7	°F
Average Weather Side Air Temperature (t_c) :	-0.5	°F
Average Guard Box Air Temperature:	72.9	°F
Area-Weighted Warm Side Surround Panel Surface Temperature (sp_1):	66.9	°F
Area-Weighted Cold Side Surround Panel Surface Temperature (sp_2):	0.7	°F
Metering Box Average Relative Humidity:	13.4	%
Note: No condensation or frost was present		
Measured Weather Side Wind Velocity:	14.3	mph
Static Pressure Difference Across Specimen:	-0.15	psf

Heat Flows:

Heat Input Rate to Metering Box (Q_{total}):	394.9	BTU/hr
Surround Panel Heat Flow (Q_{sp}):	123.1	BTU/hr
Surround Panel Thickness:	5.449	Inches
Surround Panel Conductance (C_{sp}):	0.04160	BTU/hr/ft²/°F
Metering Box Heat Flow (Q_{mb}):	8.9	BTU/hr
Flanking Loss Heat Flow (Q_{fl}):	1.0	BTU/hr
Net Test Specimen Heat Flow (Qs):	261.9	BTU/hr
EMF vs Heat Flow Equation:	-9420*EMF + (-0.9729)	

Test Results & Calculated Test Data:

Emittance of Glass (e_1):	0.84	
Warm Side Baffle Emittance (e_{b1}):	0.96	
Equivalent Room Side Surface Temperature (T_1):	51.2	ºF
Equivalent Weather Side Surface Temperature (T_2):	4.5	ºF
Room Side Baffle Surface Temperature (Tb_1):	69.5	ºF

Test Results & Calculated Test Data: (continued)

Measured Room Side Surface Conductance (h_h):	1.46	BTU/hr/ft²/°F
Measured Weather Side Surface Conductance (h_c):	5.46	BTU/hr/ft²/°F
Test Specimen Thermal Conductance (C_s):	0.58	BTU/hr/ft²/°F
Convection Coefficient (K):	0.331	
Radiative Test Specimen Heat Flow (Q_{r1}):	139.1	BTU/hr
Convective Test Specimen Heat Flow (Q_{c1}):	122.8	BTU/hr
Radiative Heat Flux of Test Specimen (q_{r1}):	14.37	BTU/hr/ft²
Convective Heat Flux of Test Specimen (q_{c1}):	12.69	BTU/hr/ft²
Standardized Room Side Surface Conductance (h_{STh}):	1.23	BTU/hr/ft²/°F
Standardized Weather Side Surface Conductance (h_{STc}):	5.28	BTU/hr/ft²/°F
Test Specimen Thermal Transmittance (U_s):	**0.39**	**BTU/hr/ft²/°F**
Test Specimen Standardized Thermal Transmittance (U_{ST}):	**0.37**	**BTU/hr/ft²/°F**

No apparent condensation was observed on the test specimen at test conditions. 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 may be expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that may occur due to the specific design and construction of the fenestration system opening. Therefore, it should be recognized 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. An estimate of the experimental uncertainty for these results is available upon request.

Per the client, the test specimen described in this report was a production line unit submitted for initial certification and plant qualification and is described 'as tested'. Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report. A copy of this report along with representative sections of the test specimen will be retained by NCTL for a period of four (4) years. The results obtained apply only to the specimen tested. This report may not be reproduced, except in full, without the written approval of National Certified Testing Laboratories. NCTL is a testing lab accredited by A2LA to ISO/IEC 17025 and assumes that all information provided by the client is accurate and does not guarantee or warranty any product tested or installed. Testing described in this report was conducted in full compliance with NFRC requirements; any deviations are noted. ASTM C1363 and C1199 testing was performed with published NFRC deviations. 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.

National Certified Testing Laboratories

Performed By:

Bryce Peters
Technician

Reviewed By:

Raymond W. Lamb, PE
Person In Responsible Charge

BP/ mk

ATTACHMENT 1

Section 1:

Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details, were Reviewed (as submitted) for Product Verification
(Reference: NCTL-110-21540-1)

See Attached Documentation;
any deviations noted.

Note: The above referenced component drawings along with representative sections of the test specimen will be retained per procedure by NCTL. This testing facility assumes that all information provided by the client is accurate.

Section 2:

Identification	Date	Page & Revision
Original Issue	11/27/2018	Not Applicable

Thermal

NFRC PRODUCT CERTIFICATION PROGRAM

Submittal Form for Test Samples

For use by manufacturers, lineal suppliers and fabricators

National Fenestration Rating Council®

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

Manufacturer: All Seasons Window & Door Systems Inc Date of sample manufacture: Oct 2018

Plant Address where manufactured: 28 Edgeboro Road

City: E. Brunswick State: NJ Zip Code: 08816

Name of IA: _____ Phone: 732-238-7100 Fax: 732-543-7047

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

Product Line ID No.: E.U Operator Type (Table 4-3 of NFRC 100): Tilt + Turn

Series/Model: 400

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

a. ☐ Validation for Initial Certification (prototype only; Section 2.2.1.C of PCP), no plant qualification
b. ☐ Validation for Initial Certification (production line unit; Section 2.2.1.B.ii of PCP) & plant qualification
c. ☐ Validation for Recertification (production line unit; Section 2.2.1.B.ii of PCP) & plant qualification
d. ☐ Plant Qualification Only (production line unit; Section 2.2.1.B.ii of PCP)

[***Note***: If the only test option is to be used, include a copy of the NFRC-certified simulator's statement and NFRC approval as required in NFRC 100 (1997) Sections 6.1 and 6.1.1.]

I, Sugen A. Yu, as the designated agent for All Season Window + Door Systems 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: _____ Date: 10/5/2018

FOR LABORATORY USE ONLY

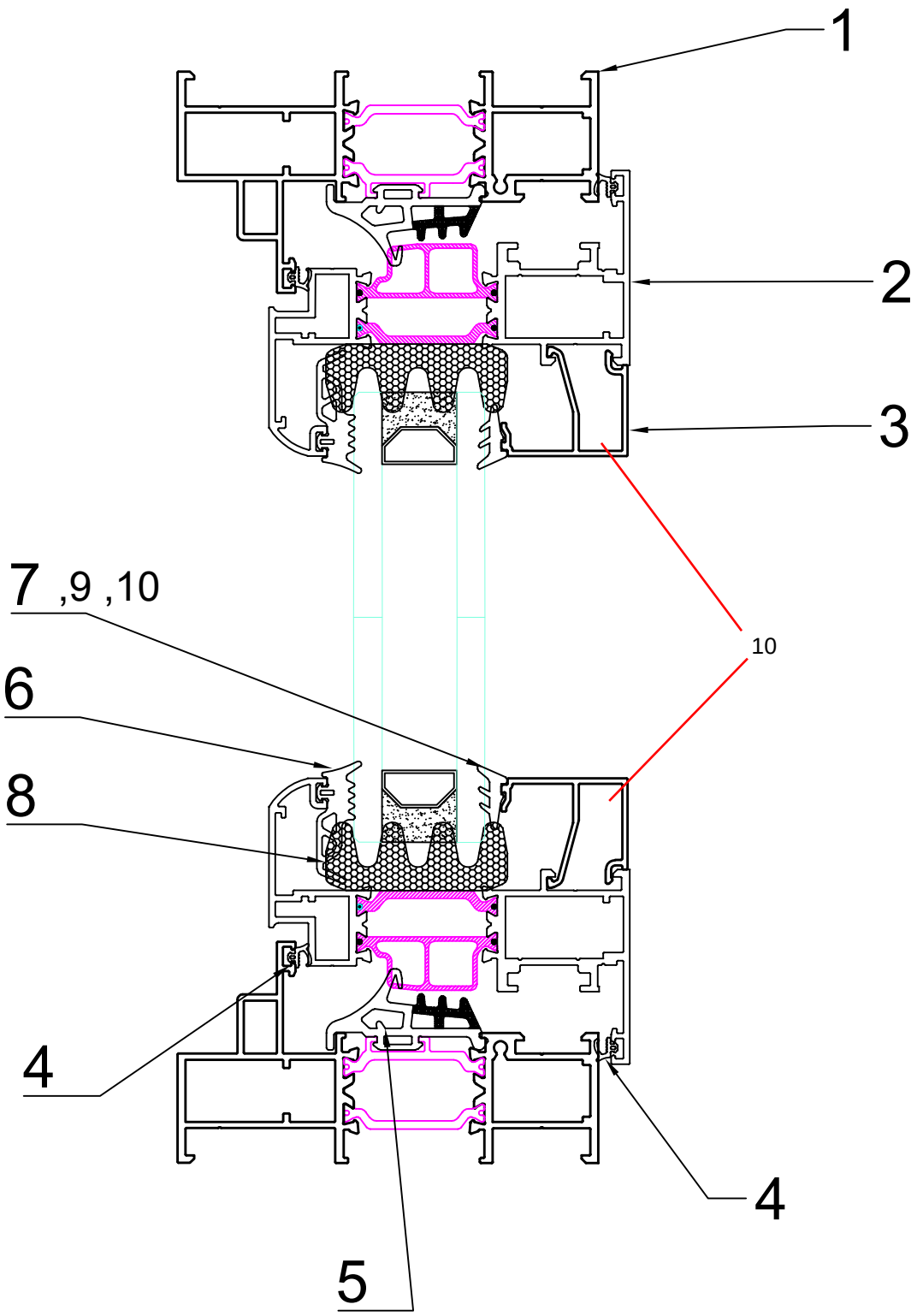
1. Laboratory: National Certified Testing Laboratories
2. Date Sample Received: 10/16/18 File number ID: 110-21540-1
3. Date Sample Tested: 10/30/18 By: Bryce Peters
4. Modifications made: _____
5. Reason for non-testing of sample unit: _____

[***Note***: If the sample submitted can not be tested due to damage prior to testing, a new sample and new form shall be submitted to the testing laboratory. Both forms shall be submitted to the IA when the testing is completed.]

ALL SEASON EU400

Item#	Part number	Part name	Material
1	AB601	EU400 FRAME	ALUMIINUM
2	AB003	EU400 SASH	ALUMIINUM
3	GB004	EU400 1¼ GLAZING	ALUMIINUM
4	EV400 - 6	GASKET	~~EPDM~~ Flexible PVC
5	EV400 - 4	GASKET	Flexible PVC/ EPDM
6	EV400 - 3	GASKET	~~EPDM~~ Flexible PVC
7	EV400 - 1	GASKET	~~EPDM~~ Flexible PVC
8	EV400 - 2	GASKET	FOAM RUBBER
9		Insulation	Foam
10		Foam Strip	Foam

TEST SPECIMEN COMPLIES WITH THESE DETAILS.
ANY DEVIATION IS NOTED BY TECHNICIAN: BP
REPORT NO. NCTL-110- 21540-1
TEST DATE: 10/30/18



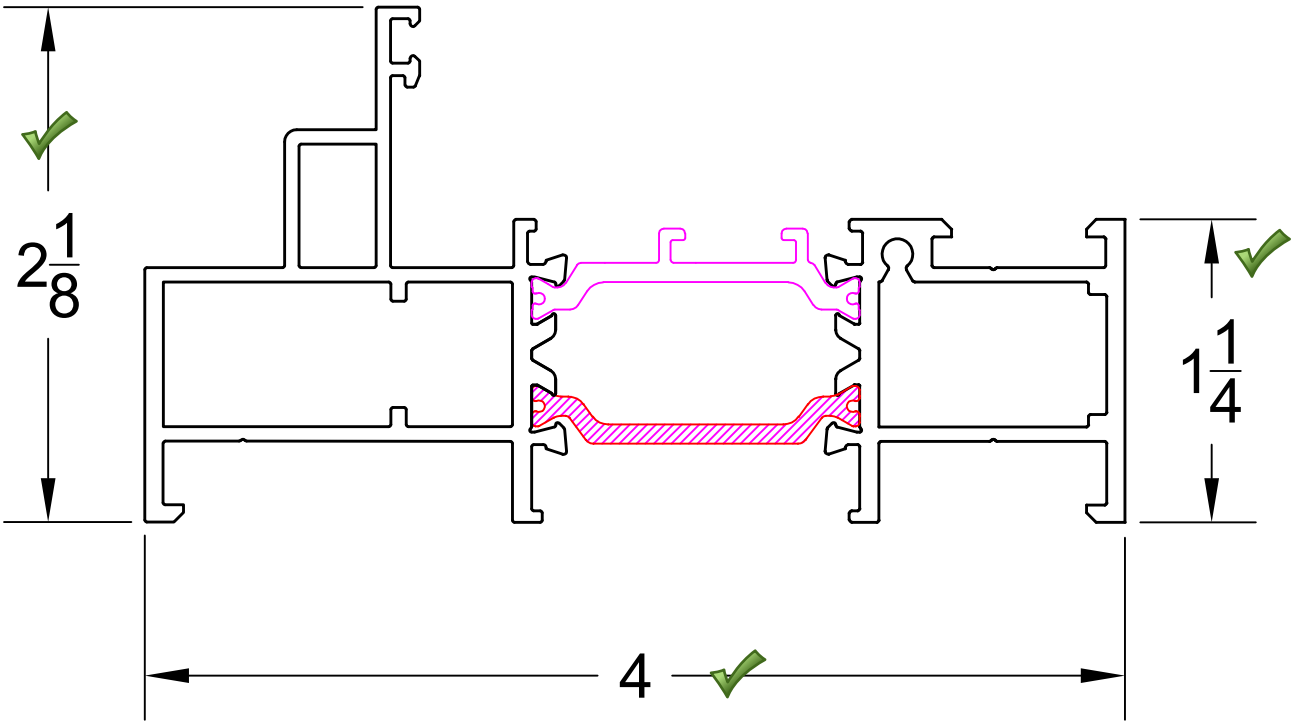
ALL SEASONS
WINDOW & DOOR SYSTEMS INC

EU400 SERIES, INSWING, TILT & TURN

28 Edgeboro Rd, East Brunswick, NJ 08816
Phone: (732)238-7100 Fax : (732)322-4668

DATE 10/05/18

TEST SPECIMEN COMPLIES WITH THESE DETAILS.
ANY DEVIATION IS NOTED BY TECHNICIAN: BP
REPORT NO. NCTL-110- 21540-1
TEST DATE: 10/30/18



EU400 SERIES, FRAME AB601

ALL SEASONS
WINDOW & DOOR SYSTEMS INC
28 Edgeboro Rd, East Brunswick, NJ 08816
Phone: (732)238-7100 Fax : (732)322-4668

DATE 10/05/18

TEST SPECIMEN COMPLIES WITH THESE DETAILS.
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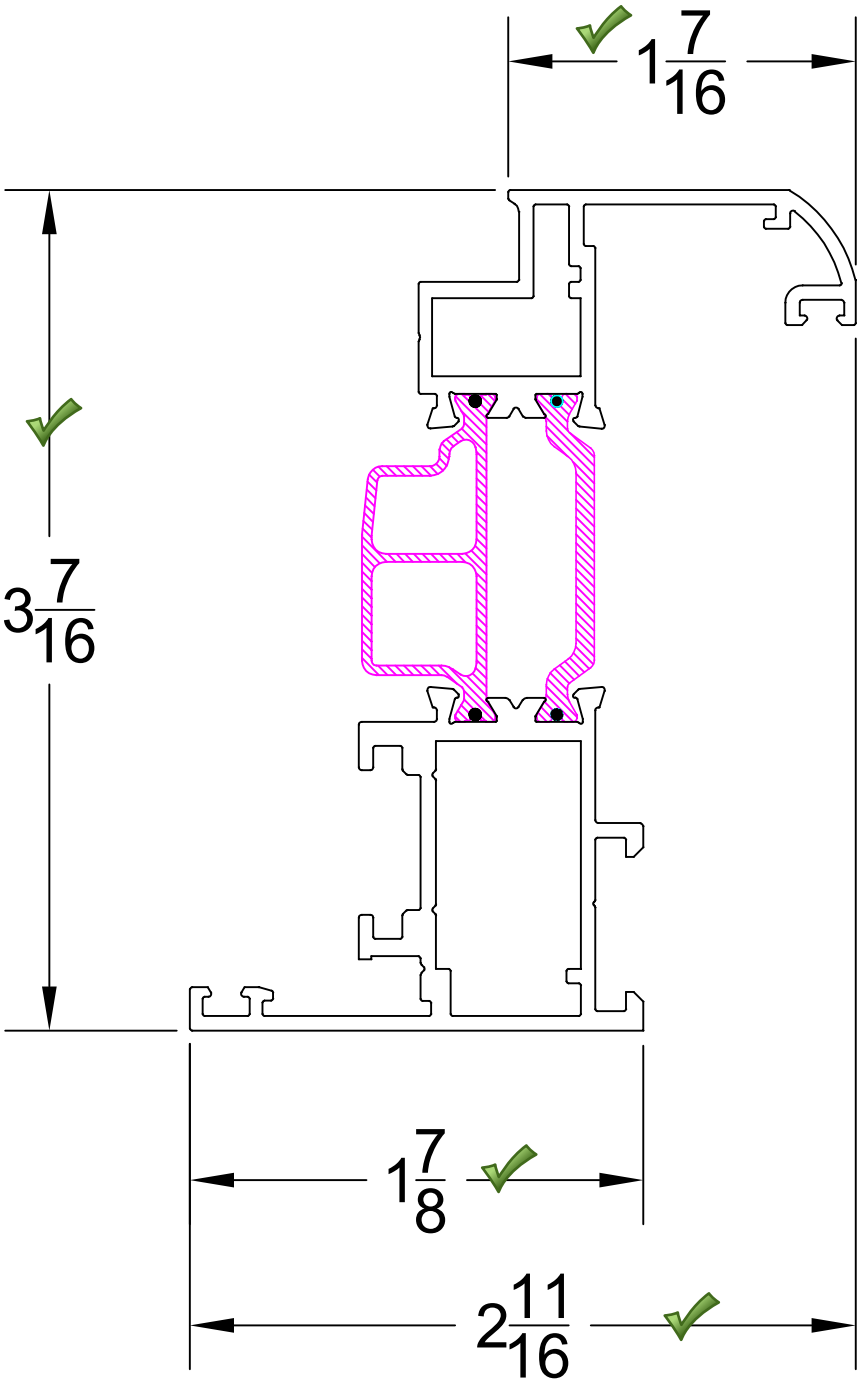
REPORT NO. NCTL-110- 21540-1
TEST DATE: 10/30/18



EU400 SERIES, SASH AB003

ALL SEASONS
WINDOW & DOOR SYSTEMS INC
28 Edgeboro Rd, East Brunswick, NJ 08816
Phone: (732)238-7100 Fax : (732)322-4668

DATE 10/05/18

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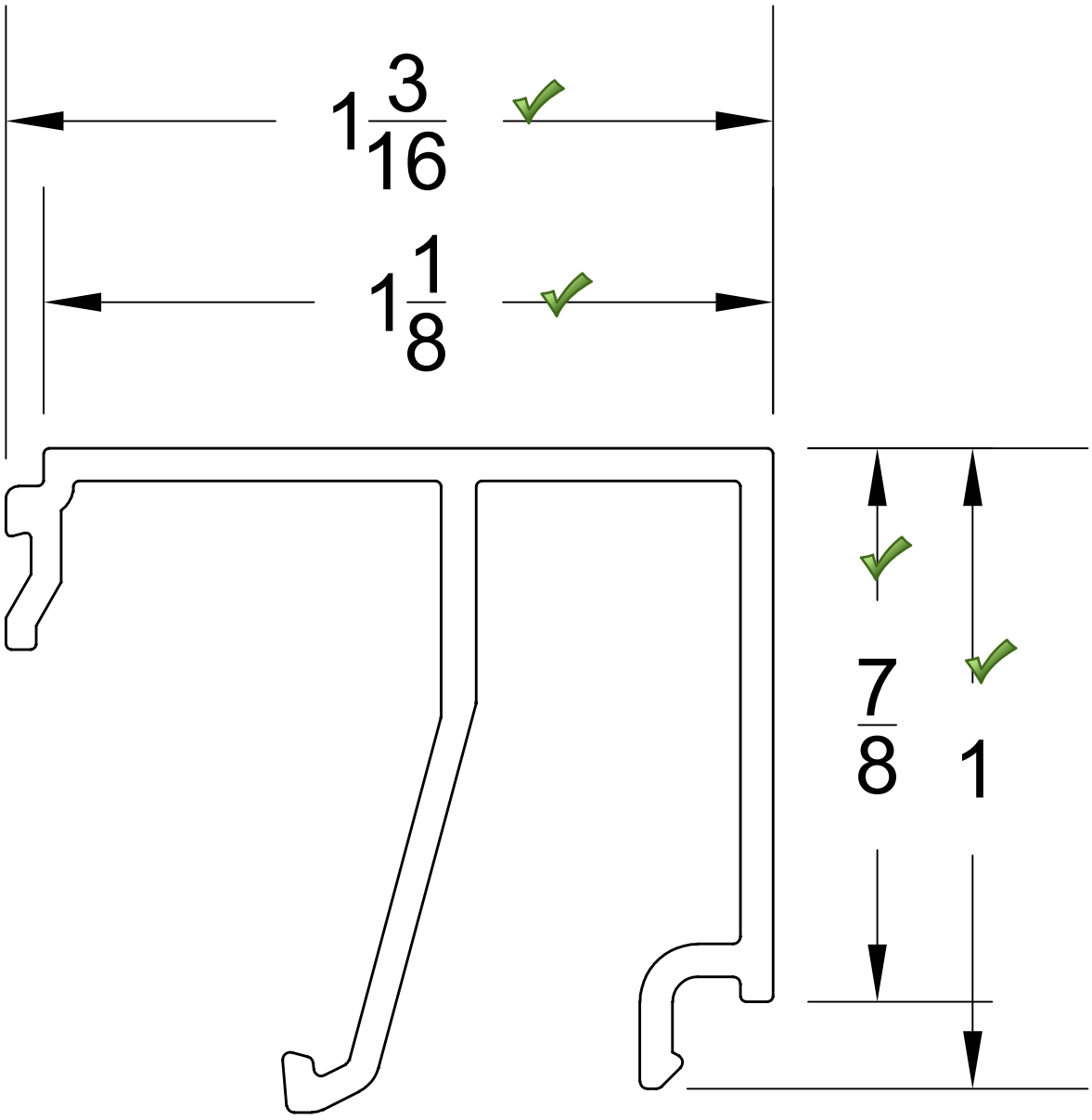

EU400 SERIES, 1.25 GLAZING GB004

ALL SEASONS
WINDOW & DOOR SYSTEMS INC
28 Edgeboro Rd, East Brunswick, NJ 08816
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DATE 10/05/18

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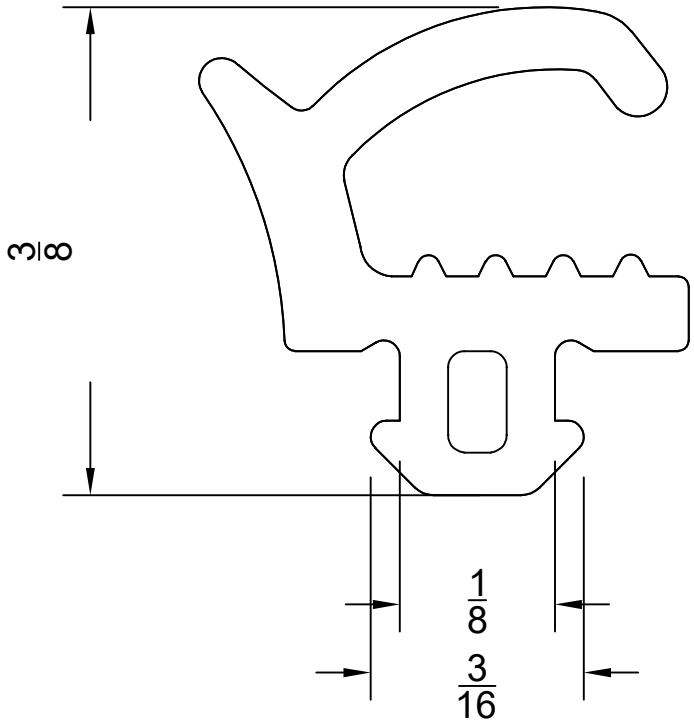

ALL SEASONS
WINDOW & DOOR SYSTEMS INC

EU400 SERIES, GASKET EU400-6

28 Edgeboro Rd, East Brunswick, NJ 08816
Phone: (732)238-7100 Fax : (732)322-4668

DATE 10/05/18

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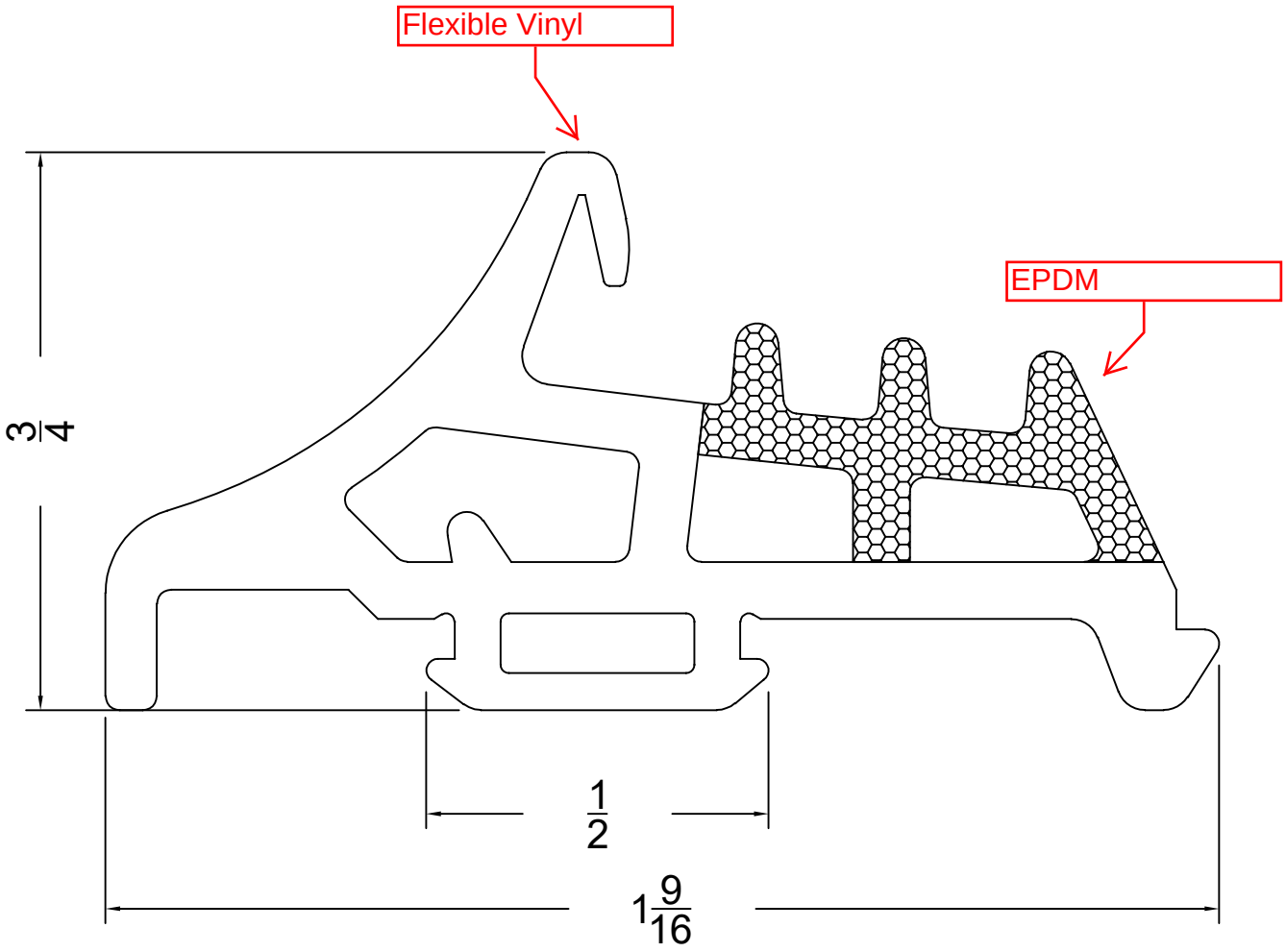
TEST DATE: 10/30/18



ALL SEASONS
WINDOW & DOOR SYSTEMS INC

EU400 SERIES, GASKET EU400-4

28 Edgeboro Rd, East Brunswick, NJ 08816
Phone: (732)238-7100 Fax : (732)322-4668

DATE 10/05/18

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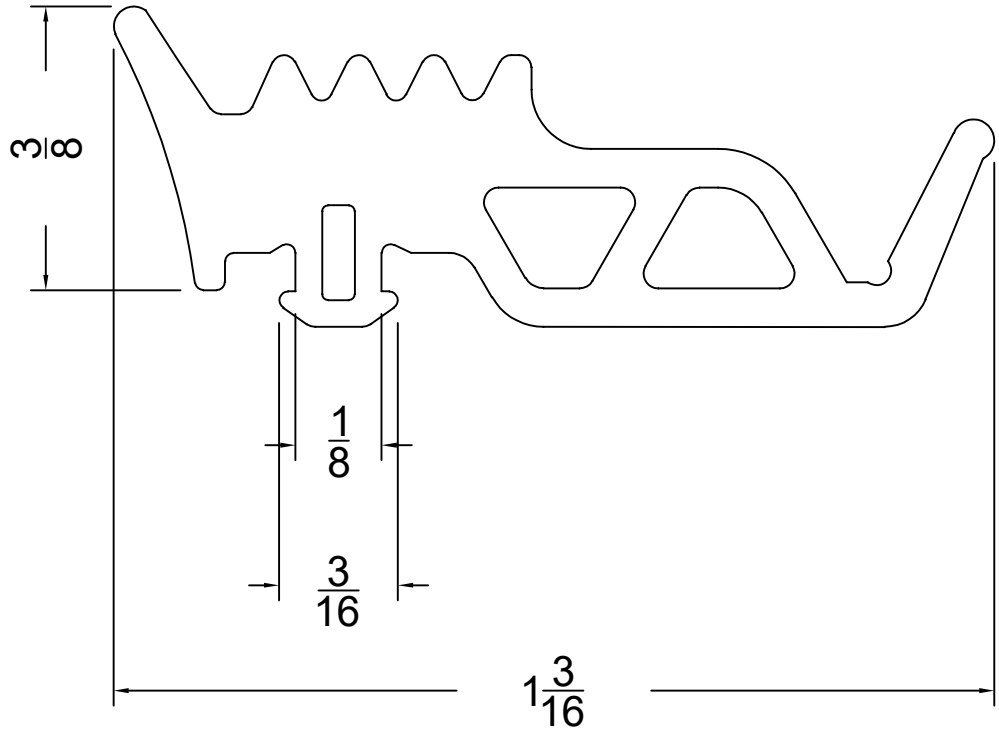
TEST DATE: 10/30/18



ALL SEASONS
WINDOW & DOOR SYSTEMS INC

EU400 SERIES, GASKET EU400-3

28 Edgeboro Rd, East Brunswick, NJ 08816
Phone: (732)238-7100 Fax : (732)322-4668

DATE 10/05/18

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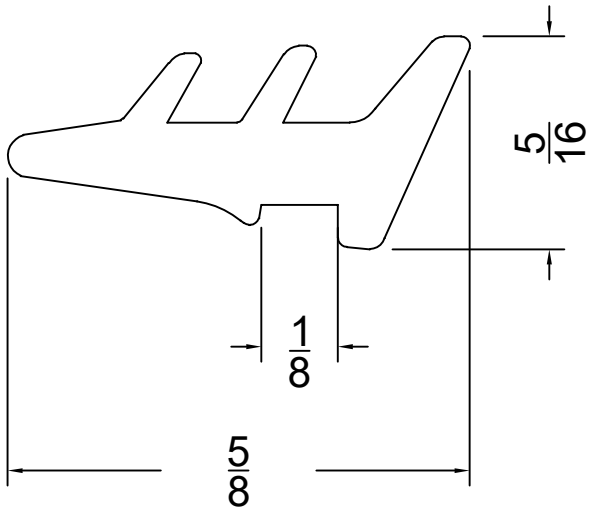
TEST DATE: 10/30/18



ALL SEASONS
WINDOW & DOOR SYSTEMS INC

EU400 SERIES, GASKET EU400-1

28 Edgeboro Rd, East Brunswick, NJ 08816
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DATE 10/05/18

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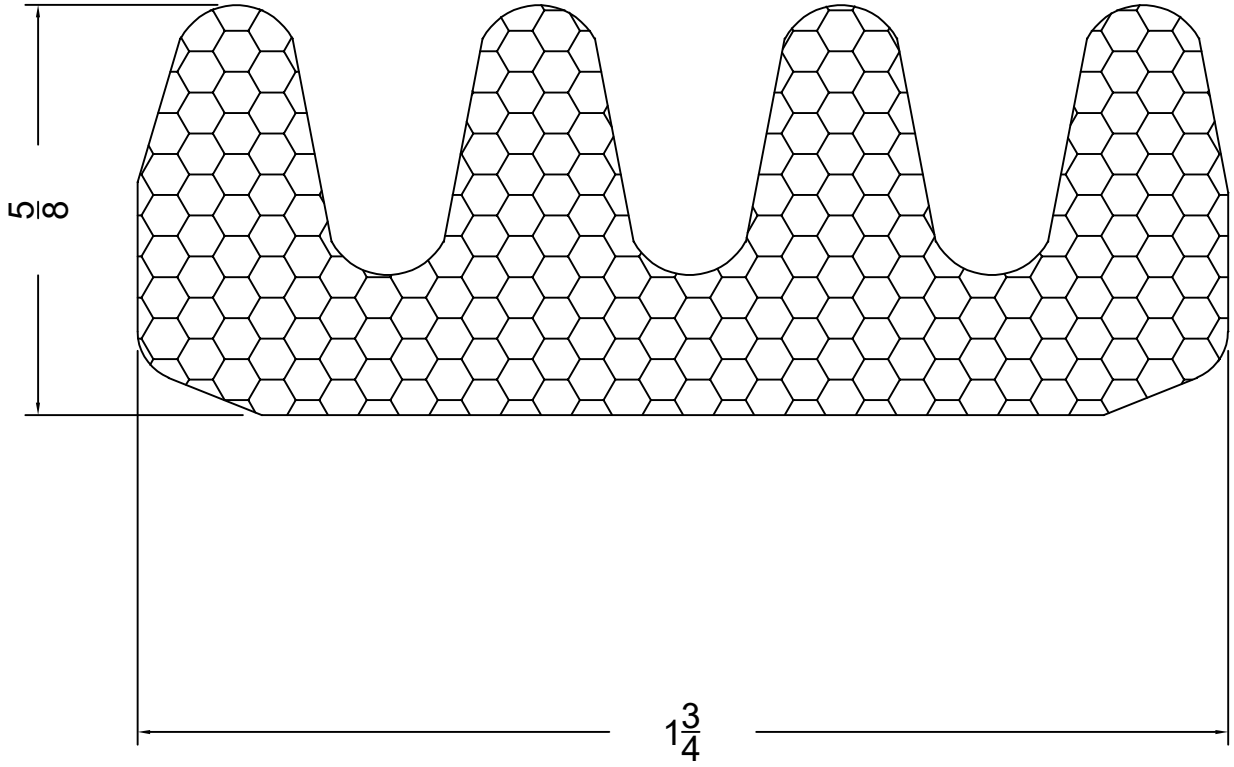
TEST DATE: 10/30/18



ALL SEASONS
WINDOW & DOOR SYSTEMS INC

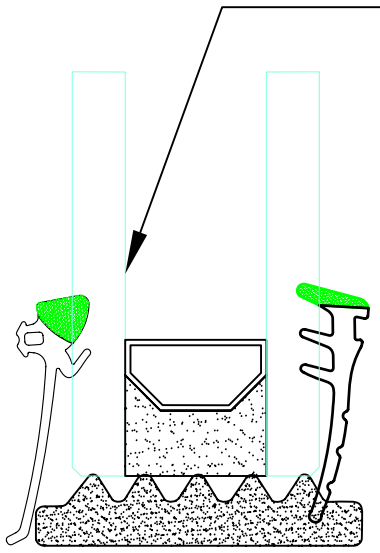
EU400 SERIES, GASKET EU400-2

28 Edgeboro Rd, East Brunswick, NJ 08816
Phone: (732)238-7100 Fax : (732)322-4668

DATE 10/05/18

Spacers are Profilglas
Dessicant is CHEM SOURCE Type 3A-IG
Molecular Sieve Beads
PIB is Kommerling GD115.
Silicone is DOW Corning 982

~~1.25"OA: Solarban 70XL (#2) over 1/4" Clear Ann. + Argon~~



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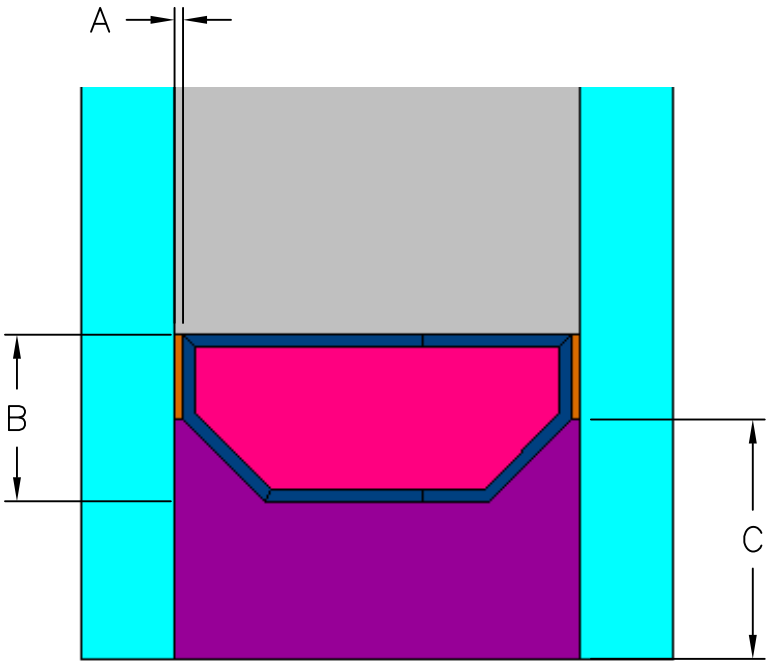
TEST DATE: 10/30/18

MANUFACTURER:	SPACER:
PROFILGLAS	ALUMINUM SPACER

SHEET:	REV:	GAS & PERCENTAGE:
1/1	00	90% ARGON

GAP WIDTHS:
0.788"



SPACER MATERIAL: ANODIZED ALUMINUM ALLOY
PRIMARY SEALANT: POLYISOBUTYLENE (PIB)

SECONDARY SEALANT: SILICONE

A) THICKNESS OF SEALANT BETWEEN GLASS : .015" B) SPACER HEIGHT: .350"

C)SECONDARY SEALANT HEIGHT: .506"