

PERFORMANCE TESTING IN ACCORDANCE WITH AAMA/WDMA/CSA 101/I.S.2/A440-11 (NAFS 2011),CSA A440S1-09 & CSA A440S1-17 AAMA/WDMA/CSA 101/I.S.2/A440-17 (NAFS 2017) & CSA A440S1:19

PRODUCT MANUFACTURER

THERMOPLAST EXTRUSIONS 3035, Le Corbusier Blvd. Laval, Quebec H7L 4C3 450-687-5115

REPORT AI-05653-A1 Rev.1

TEST REPORT SUMMARY		
Product type	Sliding Door	
Product series/model H5-2020 (2-PANELS) HYBRID		
Primary designator	Class R – PG55 : Size tested 1800 x 2065 mm (~71 x 81 in) – Type SD	
Optional secondary Positive Design pressure (DP) = 3120 Pa (~65.16 psf)		
designator	lesignator Negative design pressure (DP) = -3120 Pa (~-65.16 psf)	
	Water penetration resistance test pressure = 400 Pa (~8.35 psf)	
	Canadian air infiltration/ exfiltration level = A3 Level (NAFS-11) / A3 Level (NAFS-17)	

See UL Laboratory Canada Inc. complete report AI-05653-A1 Rev.1 for test specimen description and detailed test results

Test laboratory location	THERMOPLAST EXTR	RUSIONS (Laval, Qc.)	
Test completion date	2021-06-14	Number of pages	8 pages & 1 appendix
Report date	2021-08-03	Revision date	2021-09-13

Prepared by:

D gitally Sign d by:

Francis Letourneau, Tech. Fenestration Testing Department UL Laboratory Canada Inc.

Approved by:

Digitally Signed by: Jean Miller, P. Eng. Laboratory Manager UL Laboratory Canada Inc.

LABORATORY, FIELD TESTING AND ADVISORY SERVICES FOR THE BUILDING ENVELOPE 125 YEARS STRONG, UL LABORATORY CANADA INC.SERVING CUSTOMERS ACROSS NORTH AMERICA AND BEYOND

CHICAGO US Headquarters 750 Anthony Trail Northbrook, IL 60062 MONTREAL Canada Headquarters 1320 Lionel-Boulet Blvd Varennes, QC J3X 1P7 TORONTO 7, Underwriters Road Toronto, ON M1R 3A9

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1.0 INTRODUCTION

UL Laboratory Canada Inc. was retained by "THERMOPLAST EXTRUSIONS" to test a fenestration product according to the performance levels in the AAMA/WDMA/CSA 101/I.S.2/A440-11 (NAFS 2011) Standard and its Canadian supplements CSA A440S1-09 & CSA A440S1-17 and the AAMA/WDMA/CSA 101/I.S. 2/A440-17 (NAFS 2017) Standard and its Canadian supplement CSA A440S1:19. The sample components and manufacturing are documented in section 2.0.

Note concerning the use of units of measurement in this report:

According to the AAMA/WDMA/CSA 101/I.S.2/A440 Standard, the use of SI (metric) units is the standard, while IP (Imperial) values given in parentheses are for reference purposes only, and are inexact rounded values. Section 5.0 contains testing results converted to IP units for the sake of convenience only. The only exception to using SI values is in the Performance Grade (PG) portion of the product designation.

Note concerning drawings:

The drawings reviewed for the production of this report are stamped and are on file at UL Laboratory Canada Inc. The availability of individual drawings will be at the discretion of the client.

2.0 DESCRIPTION OF THE SPECIMEN(S) TESTED

Model H5-2020 (2-PANNEAUX) HYBRID

Product type SD – (Sliding door)

Operation mode Sliding

Drawings (Appendix) PORTE PATIO H5-2020 PATIO DOOR, 9708, 9791, 9798, 9717

Drawings (Others)

L9798, L3784, L9708, L9719, L9614A, L9749, L9710, L9712, S-19376, S-19374, 991398, L9779, S-17525, S-17286, S-17285, S-19375, S-17284, S19377, S-18145, L9717, S19195, L1055, RENF9717

Date(s) of testing

2021-06-14

Test specimen installation (test buck)

Material: Pine (~2" x 12")

R.O. clearances: 4 mm (0.16")

<u>Fastening</u>: Sill: (6) #8 x 1-1/2" pan head screws with shims at 150 mm (5.91"), 450 mm (17.72"), 765 mm (30.12") from each corner. Head: (6) #8 x 2-1/2" pan-head screws with shims at 150 mm (5.91"), 450 mm (17.72"), 765 mm (30.12") from each corner. Jambs: (7) #8 x 2-1/2" pan-head screws with shims at 170 mm (6.69"), 480 mm (18.90"), 790 mm (31.10") from each corner and at mid span

Sealing detail: Sealant between test buck and specimen on exterior perimeter only.

Frame

Material: Extruded PVC and Extruded Aluminum cladding

<u>Joinery type</u>: Mechanical assembly (screwed) (4) #10 x 2" Truss screws from jambs toward sill/head. (5) #10 x 1" pan-head screws at sill in the extruded aluminum sill adaptor. Clipped extruded aluminum cladding. Reinforcement: No reinforcement

<u>Weatherstripping</u>: Glued closed-cell foam pads at frame assembly. 690 mm glazing tape glued behind fixed panel side jamb adaptor lined up with intermediate track. 42 mm x 23 mm x 12 mm 6 fins dust pad glued on the sill at sliding panel meeting junction. (2) Closed-cell foam glued on frame at fixed panel and head/sill junction. *Schlegel HF 7320* in each keys of the sill, jambs and head. See drawing *PORTE PATIO H5-2020* in the appendix

<u>Sealant</u>: Sealant at frame assembly. Sealant at sill/head intermediate track and jamb junctions. Sealant at sill adaptor junctions. Sealant between sill insect screen rail and jambs. Sealant at extremities of the water cover of the inner drainage track. Sealant going 203 mm (~8") between PVC frame and aluminum extrusion at each corner.

<u>Drainage</u>: Interior: 3.2 mm wide linear drainage, in mobile panel's track. (2) 25.4 mm x 10 mm slots under water cover at 35 mm from jamb and meeting. (2) 5 mm x 4 mm drainage slots at 35 mm from the jamb and meeting on the support block. Exterior: (2) 30 mm x 4.5 mm drainage slots on the exterior face of the sill at 95 mm from corners with weep holes. (2) 8 mm Ø holes at 25 mm from each sill exterior aluminum extrusion corner. See drawing *9708*, *9791*, *9798* in the appendix

Glazing: None

Overall dimensions: 1800 mm (70.87") W x 2065 mm (81.30") H

Sliding door fixed panel

Material: Extruded PVC with extruded aluminum cladding

Joinery type: Thermally welded mitre joints with clipped aluminum cladding

<u>Fastening</u>: 127 mm (5.00") Extruded aluminum clips pieces # A3010 clipped to frame and at the panel. Stile: (3) clips at 76 mm (2.99") and at mid-span. Upper rail: (1) Clip at 51 mm (2.01") from panel meeting adaptor. (2) #10 x 1-1/4" screws. Panel screwed under the meeting adaptor with #10 x 1-1/4"; (2) at upper rail toward rail and (2) at lower rail toward sill. (2) # 10 x 1-1/4" screws in stile toward jamb

<u>Reinforcement</u>: *RENF9717* steel reinforcement screwed with (5) #8 x 1" self-tapping screws in the stiles. See drawing *PORTE PATIO H5-2020* in the Appendix

<u>Weatherstripping</u>: *Amesbury 32663* bulb at rails and jamb stile. *Q-long* type weatherstrip at meeting stile adaptor. *Schlegel HF 7320* at meeting stile. *Schlegel HF-7320* at rails on the interior key slots. Foam at upper and lower extremities of the meeting adaptor. Closed cell foam glued on the PVC at each corner of the panel making the junctions of the aluminum claddings. See drawing *PORTE PATIO H5-2020* in the appendix

<u>Sealant</u>: Sealant at corners of the glazing tape. 51 mm joint under glazing stops up and across at each corners. Sealant at meeting adaptor extremities covering the foams. Sealant at junction between meeting adaptor and fixed panel. Sealant going 203 mm (\sim 8") between PVC frame and aluminum extrusion at each

corner.

Drainage: See drawing 9717 in the Appendix

<u>Glazing</u>: Double glazed sealed unit (25.7 mm) / Nominal glass thickness : 3 mm / Air space gap: 19.5 mm / Type of glass: Tempered / Type of spacer: *Endur* / Type of sealant: Dual-sealed / Type of filling gas: Air / Glass retention: Glazing stop / Glazing seals: Coextrusion and glazing tape on the exterior face (wet glazing) and coextrusion on the interior face (dry glazing) / Grid description: None / Setting blocks: (3) blocks at stiles, (2) blocks at rails / Daylight opening: 719 mm W x 1777 mm H

Overall dimensions: 904 mm (35.59") W x 1962 mm (77.24") H

Sliding door mobile panel

Material: Extruded PVC with Extruded aluminum cladding

Joinery type: Thermally welded mitre joints and clipped extruded aluminum cladding

<u>Reinforcement</u>: *RENF9717* steel reinforcement screwed with (5) #8 x 1" self-tapping screws in the stiles. See drawing *PORTE PATIO H5-2020* in the appendix

<u>Weatherstripping</u>: *QEZ* weatherstrip at meeting adaptor. *Schlegel HF-7320* at meeting stile. Foam filling meeting adaptor extremities. Foam at upper and lower extremities of the meeting adaptor. Closed cell foam glued on the PVC at each corner of the panel making the junctions of the aluminum claddings. See drawing *PORTE PATIO H5-2020* in the appendix

<u>Sealant</u>: Sealant at corners of the glazing tape. 51 mm joint under glazing stops up and across at each corners. Sealant at meeting adaptor edges. Sealant at junction between meeting adaptor and panel. Sealant filling the meeting adaptors extremities.

<u>Drainage</u>: (2) 25 mm x 4 mm drainage slots at 20 mm from each corners under the glazed unit. (2) 25 mm x 4 mm at 80 mm from corners under the door panel, in the central cavity. See drawing *9717* at the appendix

<u>Glazing</u>: Double glazed sealed unit (25.7 mm) / Nominal glass thickness : 3 mm / Air space gap: 19.5 mm / Type of glass: Tempered / Type of spacer: *Endur* / Type of sealant: Dual-sealed / Type of filling gas: Air / Glass retention: Glazing stop / Glazing seals: Coextrusion and glazing tape on the exterior face (wet glazing) and coextrusion on the interior face (dry glazing) / Grid description: None / Setting blocks: (3) blocks at stile, (2) blocks at rails / Daylight opening: 719 mm W x 1777 mm H

Overall dimensions: 904 mm (35.59") W x 1962 mm (77.24") H

Screen

<u>Frame material</u>: Extruded aluminium <u>Mesh material</u>: Fiberglass <u>Anchoring method</u>: Channelled <u>Auxiliary parts</u>: (1) Handle / (4) Corner brackets with spring roller / Weatherstrip <u>Overall dimensions</u>: 928 mm (36.54") W x 1983 mm (78.07") H

Hardware

See hardware description in the bill of materials. Part number and manufacturer/ supplier information for hardware components provided by the client.

(1) panel bumper; (1) #8 x 2" full thread screw, with sealant filling the entire junction on fixed panel.

- (2) Tandem rollers; (1) #8 x 1-1/2" screws ea.
- (1) Handle; (2) # 8 x 2-1/4" screws
- (2) Connectors; (4) #10 x 1-1/2" screws ea.
- (1) Keeper; (2) #10 x 1-1/4" screws

Alteration(s) performed in the laboratory on tested specimen to meet the reported performances: None.

4.0 TEST BENCH INFORMATION

Test bench identification: THERMOPLAST EXTRUSIONS

The testing was performed at *Thermoplast Extrusions* testing facility in Laval (Quebec/Canada) and was performed by UL Laboratory Canada Inc. personnel. The calibration of this test bench was done as per Article 9.0 of ASTM E283, Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors, and ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference and ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Valls by Uniform Static Air Pressure Difference and ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cycling Static Air Pressure Difference. The last calibration of this test bench and related equipment was performed in February, 2021. The equipment used for testing is the property of Thermoplast Extrusions Laboratory and is not under our control between the calibration periods.

5.0 RESULTS OF PERFORMANCE TESTS

SPECIFICATIONS		
SPECIFICATIONS SPECIFICATIONS SPECIFICATIONS SPECIFICATIONS SPECIFICATIONS SPECIFICATIONS EXPECIFICATIONS Force to initiate motion: R – LC Classifications < 110 N (~24.73 lbf) Force to maintain motion: R – LC Classifications < 110 N (~24.73 lbf) CW-AW Classifications < 110 N (~25.85 lbf) Force to latch < 100 N (~22.48 lbf) AMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.1. A440S1-09 & A440S1-17 Canadian Supplements par. 5.2 AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.1. A440S1-17 Canadian Supplement par. 5.3 ASTM-E2068-00 (2008)	TEST RESULTS Passed R Classification Measured to initiate = 71 N (~16 lbf) Measured to maintain = 67 N (~15 lbf) Measured to latch = 8 N (~2 lbf)	
U.S. Air Leakage Resistance Test $R - LC - CW$ Classifications: $Q_{inf} \le 1.5$ l/s-m ² @ 75 Pa (~ ≤ 0.3 cfm/ft ² @ 1.57 psf) AW Classification: $Q_{inf} \le 1.5$ l/s-m ² @ 300 Pa (~ ≤ 0.3 cfm/ft ² @ 6.27 psf) Amation air infiltration/exfiltration levels $R - LC - CW$ Classifications: $A2: Q \le 1.5$ l/s-m ² @ 75 Pa (~ ≤ 0.3 cfm/ft ² @ 1.57 psf) A3: Q ≤ 0.5 l/s-m ² @ 75 Pa (~ ≤ 0.1 cfm/ft ² @ 1.57 psf) AW Classification: $A2: Q_{inf} \le 1.5$ l/s-m ² @ 300 Pa (~ ≤ 0.3 cfm/ft ² @ 6.27 psf) Qext ≤ 1.5 l/s-m ² @ 75 Pa (~ ≤ 0.3 cfm/ft ² @ 1.57 psf) A3: Qint ≤ 1.5 l/s-m ² @ 75 Pa (~ ≤ 0.3 cfm/ft ² @ 1.57 psf) A3: Qint ≤ 1.5 l/s-m ² @ 75 Pa (~ ≤ 0.1 cfm/ft ² @ 1.57 psf) A3: Qint ≤ 0.5 l/s-m ² @ 75 Pa (~ ≤ 0.1 cfm/ft ² @ 1.57 psf) A3: Qint ≤ 0.5 l/s-m ² @ 75 Pa (~ ≤ 0.1 cfm/ft ² @ 1.57 psf) A3: Qint ≤ 0.5 l/s-m ² @ 75 Pa (~ ≤ 0.1 cfm/ft ² @ 1.57 psf) AAMA/WDMA/CSA 101/l.S.2/A440-11 par. 9.3.2 A440S1-09 & A440S1-17 Canadian Supplements par. 5.3 ASTM-E283-04 (2012)	Class R – U.S. Requirements (NAFS-11) A3 Level – Canadian Requirements (NAFS-11) Surface: 3.72 m^2 (~40.01 ft ²) Q _{inf} = 0.34 l/s-m ² @ 75 Pa (~0.07 cfm/ft ² @ 1.57 psf) Q _{exf} = 0.40 l/s-m ² @ 75 Pa (~0.08 cfm/ft ² @ 1.57 psf)	
Air Leakage Resistance Test $R - LC - Classifications:$ $Q_{inf} \le 1.5 l/s-m^2$ @ 75 Pa (~ $\le 0.3 cfm/ft$ @ 1.57 psf)Canadian air infiltration/exfiltration levels: $A2: Q \le 1.5 l/s-m^2$ @ 75 Pa (~ $\le 0.3 cfm/ft$ @ 1.57 psf)A3: Q $\le 0.5 l/s-m^2$ @ 75 Pa (~ $\le 0.1 cfm/ft$ @ 1.57 psf)A3: Q $\le 0.5 l/s-m^2$ @ 75 Pa (~ $\le 0.1 cfm/ft$ @ 1.57 psf)CW Classification:Q $\le 1.0 l/s-m^2$ @ 75 Pa (~ $\le 0.2 cfm/ft$ @ 1.57 psf)AW Classification:Qinf $\le 1.5 l/s-m^2$ @ 300 Pa (~ $\le 0.3 cfm/ft$ @ 6.27 psf)Qext $\le 0.5 l/s-m^2$ @ 75 Pa (~ $\le 0.1 cfm/ft$ @ 1.57 psf)AAMA/WDMA/CSA 101/l.S.2/A440-17 par. 9.3.2A440S1-17 Canadian Supplement par. 5.4ASTM-E283-04 (2012)	Class R – U.S. Requirements (NAFS-17) A3 Level – Canadian Requirements (NAFS-17) Surface: 3.72 m^2 (~40.01 ft ²) Q _{inf} = 0.34 l/s-m ² @ 75 Pa (~0.07 cfm/ft ² @ 1.57 psf) Q _{exf} = 0.40 l/s-m ² @ 75 Pa (~0.08 cfm/ft ² @ 1.57 psf)	

Water Resistance TestNo water infiltration under a minimum pressuredifferential:Class R: 140 Pa (~2.92 psf)Class LC: 180 Pa (~3.76 psf)Class CW: 220 Pa (~4.59 psf)Class AW: 390 Pa (~8.15 psf)AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.3.A440S1-09 & A440S1-17 Canadian Supplements par. 5.4AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.2A440S1-19 Canadian Supplement par. 5.5Classes R, LC & CW: ASTM-E547-00 (2009 & 2016)Class AW: ASTM-E547-00 (2009 & 2016) & ASTM-E331-00(2009 & 2016)	 Class R – U.S. & Canadian Requirements With & without screen No water infiltration under the minimum test pressure for the Class. No water infiltration at an optional test pressure differential of: 400 Pa (~ 8.35 psf) - U.S. & Canadian Requirements
Uniform Load Deflection Test Member deflection at a minimum design pressure (DP) and at optional DP: Class R: 720 Pa (~15.04 psf) – Reported only Class LC: 1200 Pa (~25.06 psf) – Reported only Class CW: Limited to L/175 at 1440 Pa (~30.08 psf) Class AW: Limited to L/175 at 1920 Pa (~40.10 psf) AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.4 AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.4 ASTM-E330-02 (2010) & ASTM-E330-14	Reported only – Class R Net deflection measured on the meeting stile: 4.03 mm @ -720 Pa (~0.16" @ -15.04 psf) 3.14 mm @ +720 Pa (~0.12" @ +15.04 psf) 13.56 mm @ -2640 Pa (~0.53" @ -55.14 psf) 12.20 mm @ +2640 Pa (~0.48" @ +55.14 psf) 14.88 mm @ -3120 Pa (~0.59" @ -65.16 psf) 14.67 mm @ +3120 Pa (~0.58" @ +65.16 psf)
Uniform Load StructuralPermanent deformation is limited at a minimumstructural test pressure (STP) and at optional STP of:Class R: $\leq 0.4\%$ (L) at 1080 Pa (~22.56 psf)Class LC: $\leq 0.4\%$ (L) at 1800 Pa (~37.59 psf)Class CW: $\leq 0.3\%$ (L) at 2160 Pa (~45.11 psf)Class AW: $\leq 0.2\%$ (L) at 2880 Pa (~60.15 psf)AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.4AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.4ASTM-E330-02 (2010) & ASTM-E330-14	STP 65 – Class R Permanent deformation measured on the meeting stile: 0.10 mm @ -1080 Pa (~0.00" @ -22.56 psf) 0.01 mm @ $+1080$ Pa (~0.00" @ $+22.56$ psf) 0.27 mm @ -3960 Pa (~0.01" @ -82.71 psf) 0.23 mm @ $+3960$ Pa (~0.01" @ $+82.71$ psf) 0.62 mm @ -4680 Pa (~0.02" @ -97.74 psf) 0.37 mm @ $+4680$ Pa (~0.01" @ $+97.74$ psf) Allowed ≤ 7.67 mm (~0.30")
Forced-Entry Resistance All sliding doors shall be tested according to ASTM F842-04 & ASTM F842-14 Grade 10. AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.5 AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.5	Passed Grade 20 T ₁ =5 min., L ₁ =2224 N (~500 <i>lbf</i>), L ₂ =890 N (~200 <i>lbf</i>), L ₃ =222 N (~50 <i>lbf</i>) & L ₄ =222 N (~50 <i>lbf</i>) + panel weight
Deglazing Test Deglazing < 90% of original glazing bite. The load for vertical sash members is 320 N (~71.94 <i>lbf</i>) and 230 N (~51.71 <i>lbf</i>) for all other rails. AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.6.3 AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.6.3 ASTM-E987-88 (2009)	Passed Allowed : 14.94 mm <i>(0.59")</i> / 90% Measured : 1.99 mm <i>(0.08")</i> / 12% stile Measured : 1.64 mm <i>(0.06")</i> / 10% rail

Welded Corner Test	Passed	
When loaded to failure, the break shall not extend along the entire weld line.	For each corner detail (panel only) the breakage does not	
AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.6 AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.6.2	extend along the entire weld line.	

6.0 CONCLUSION

The fenestration product described in this report was tested in accordance with the AAMA/WDMA/CSA 101/I.S.2/A440-11 (NAFS 2011) Standard and its Canadian supplements CSA A440S1-09 & CSA A440S1-17 and the AAMA/WDMA/CSA 101/I.S. 2/A440-17 (NAFS 2017) Standard and its Canadian supplement CSA A440S1:19, regarding performance testing. The above results were secured by using the designated test methods and the performance requirements of the referenced specification.

Detailed assembly drawings showing wall thickness of all members, corner construction and hardware application are on file and have been compared to the sample submitted.

The test records from this evaluation will be retained for a minimum of four (4) years from the date of report issuance. This report does not constitute certification of this product, which may only be granted by a certification agency.

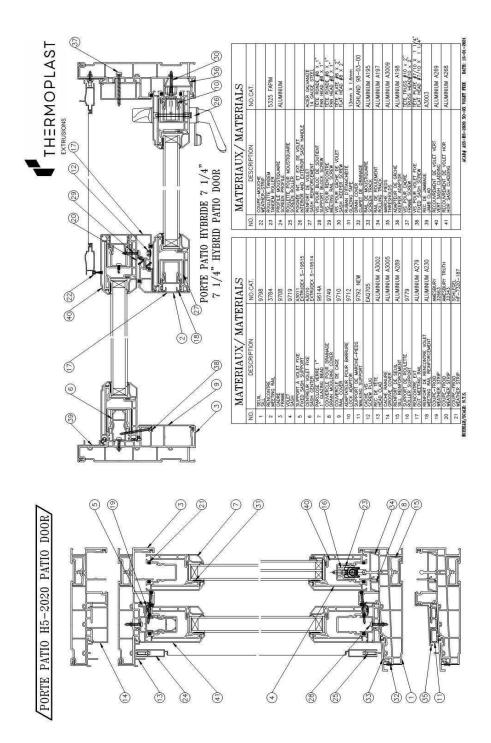
Note on the Limitation of Liability:

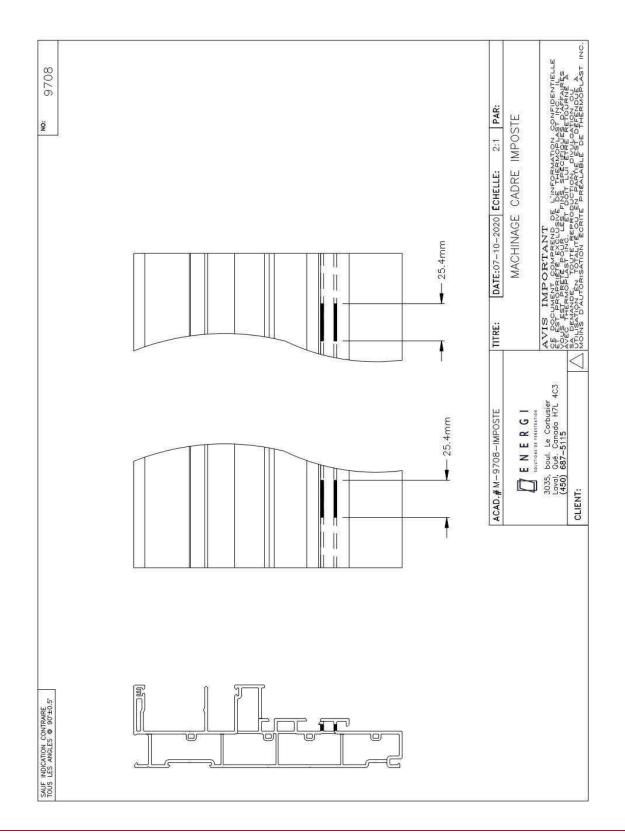
Due care was taken in performing the testing sequence and in reporting the results related to the test specimen received for evaluation. Through acceptance of this report, the Client agrees to exempt UL Laboratory Canada Inc. employees and owners from all liability claims and demands arising from any matter related to or concerning the quality and execution of the performance evaluation contained in this report. The Decision Rule is based on Simple Acceptance (Measurement Uncertainty is not taken into account when making a statement of conformity).

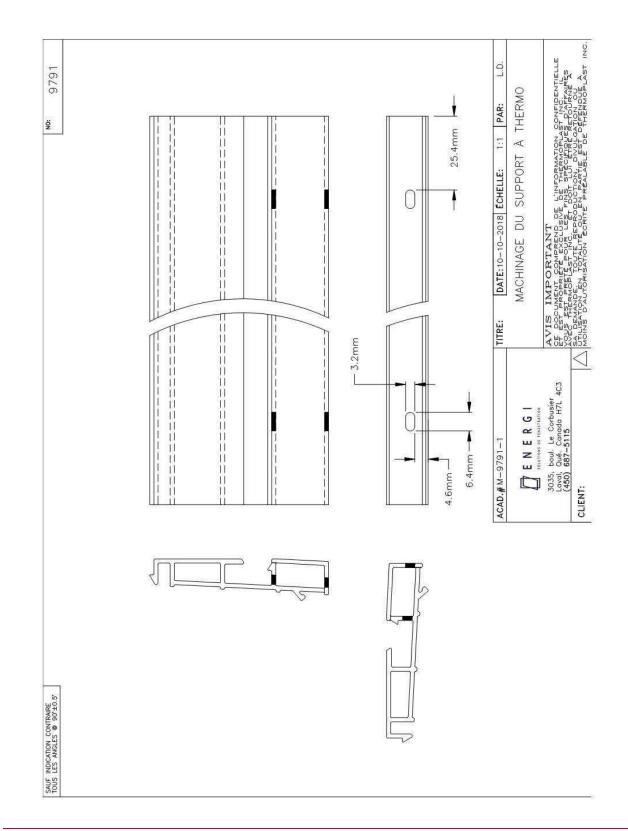
7.0 REVISION LOG

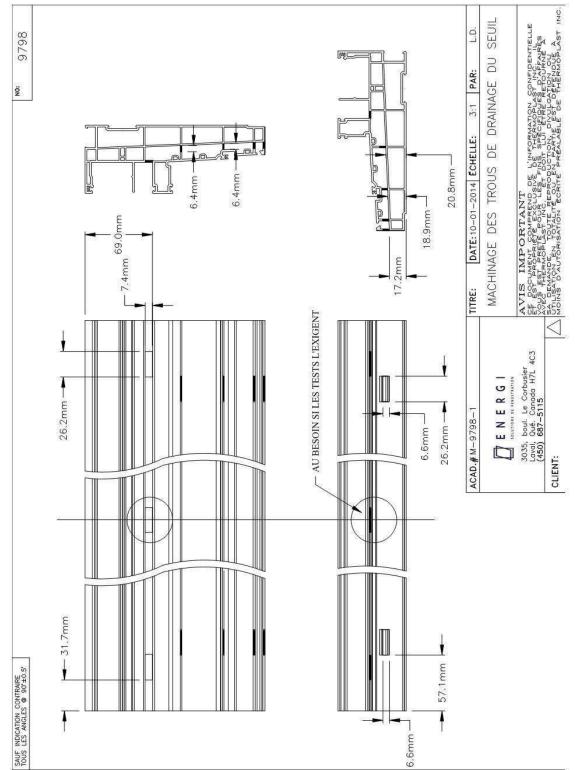
Rev. #	Date	Page(s)	Revision(s)
1	2021-09-13	Header, 2, 4	Report update

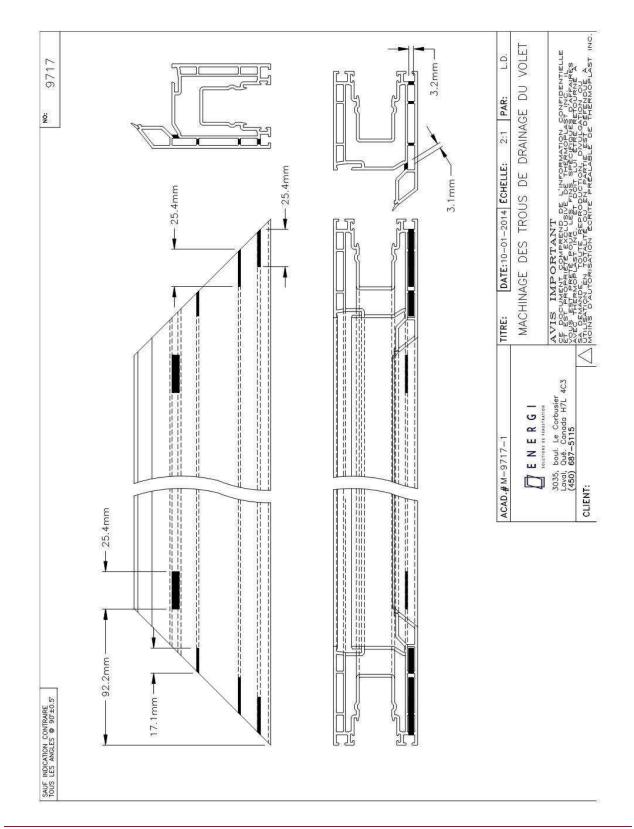
APPENDIX DRAWINGS, SEALANT, DRAINAGE DETAILS & BILL OF MATERIALS











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