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EVALUATION REPORT

Applicant File Number: W517
Report Number: W517-1 ED4

Applicant: Richard Debiasio
Uni-Tech Wiindows Manufacturer Inc.
260 Jevlan Drive
Woodbridge, ON
L4L 8B1
Canada

Edition 4: April 26, 2019
Application Number: W517 – Burnaby Office.
Issued by: Neil Dumont, Project Manager.
Reviewed by: Matt Lansdowne, Director of Engineering.
Contents: Pages 1 through 18,
Appendix A (pages A1 through A39) included separately in file titled:
W517-1 Uni-Tech Evaluation Report Appendix A – 26042019.pdf

APPLICABLE REQUIREMENTS:

CSA A440.2-14: Fenestration Energy Performance

SUBJECT:

FENESTRATION: Energy Performance of Windows and Doors

Manufacturing Location:		Labeling Location:
1)	Uni-Tech Windows Manufacturer Inc. 260 Jevlan Drive Woodbridge, ON L4L 8B1	Uni-Tech Windows Manufacturer Inc. 260 Jevlan Drive Woodbridge, ON L4L 8B1

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MODELS:

Fenestration Product Model	Glazing Option Model Code
Casement Window	UTM-VCAS-3,CL-16AR95TG-3,SB60(3)
Casement Window	UTM-VCAS-3,SB60(2)-16AR95TG-3,S700(4)
Casement Window	UTM-VCAS-3,CL-16AR95TG-3,ENAD(3)
Casement Window	UTM-VCAS-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)
Casement Window	UTM-VCAS-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)
Casement Window	UTM-VCAS-3,CL-16AR95TG-3,7036(3)
Awning Window	UTM-VAWN-3,CL-16AR95TG-3,SB60(3)
Awning Window	UTM-VAWN-3,SB60(2)-16AR95TG-3,S700(4)
Awning Window	UTM-VAWN-3,CL-16AR95TG-3,ENAD(3)
Awning Window	UTM-VAWN-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)
Awning Window	UTM-VAWN-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)
Awning Window	UTM-VAWN-3,CL-16AR95TG-3,7036(3)
Low Fixed Window	UTM-VLFIX-3,CL-16AR95TG-3,SB60(3)
Low Fixed Window	UTM-VLFIX-3,SB60(2)-16AR95TG-3,S700(4)
Low Fixed Window	UTM-VLFIX-4,CL-16AR95TG-4,SB60(3)
Low Fixed Window	UTM-VLFIX-5,CL-16AR95TG-5,SB60(3)
Low Fixed Window	UTM-VLFIX-4,SB60(2)-16AR95TG-4,S700(4)
Low Fixed Window	UTM-VLFIX-5,SB60(2)-16AR95TG-5,S700(4)
Low Fixed Window	UTM-VLFIX-3,CL-16AR95TG-3,ENAD(3)
Low Fixed Window	UTM-VLFIX-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)
Low Fixed Window	UTM-VLFIX-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)
Low Fixed Window	UTM-VLFIX-3,CL-16AR95TG-3,7036(3)
Horizontal Sliding Window	UTM-VHS-3,CL-16AR95TG-3,SB60(3)
Horizontal Sliding Window	UTM-VHS-3,SB60(2)-16AR95TG-3,S700(4)
Horizontal Sliding Window	UTM-VHS-3,CL-16AR95TG-3,ENAD(3)
Horizontal Sliding Window	UTM-VHS-3,CL-16AR95TG-3,7036(3)
Vertical Sliding Window	UTM-VVS-3,CL-16AR95TG-3,SB60(3)
Vertical Sliding Window	UTM-VVS-3,SB60(2)-16AR95TG-3,S700(4)
Vertical Sliding Window	UTM-VVS-3,CL-16AR95TG-3,ENAD(3)
Vertical Sliding Window	UTM-VVS-3,CL-16AR95TG-3,7036(3)
Hybrid Casement Window	UTM-HCAS-3,CL-16AR95TG-3,SB60(3)
Hybrid Casement Window	UTM-HCAS-3,SB60(2)-16AR95TG-3,S700(4)
Hybrid Casement Window	UTM-HCAS-3,CL-16AR95TG-3,ENAD(3)
Hybrid Casement Window	UTM-HCAS-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)
Hybrid Casement Window	UTM-HCAS-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)
Hybrid Casement Window	UTM-HCAS-3,CL-16AR95TG-3,7036(3)

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CONDITIONS OF ACCEPTANCE:

1. The manufacturer must complete a final inspection on 100% of listed products to show compliance with this evaluation report prior to application of the QAI mark.

2. Installation instructions are provided with products covered under this evaluation report.

Marking Methods

Marking Method A:

Permanent label stock with permanent adhesive.

MARKINGS:

Each produced unit is marked using *Marking Method A* with the following content on a permanent label that is readily visible after installation:

- Manufacturer's name, Trademark or other recognized symbol or identification
- QAI File number (W517)
- QAI logo with "c" indicator
- "Evaluation for energy performance in accordance with CSA A440.2"
  "Évalué pour la performance d'énergie en accord à la norme CSA A440.2"

Notes:

Label artwork must be provided to QAI for approval or labels may be purchased from QAI.

The energy performance characteristics (U-Value, SHGC, Visual Transmission and Energy Rating) may be placed on a separate non-permanent label.

WARNING! Window physical performance ratings are **NOT** to be included on the same label and/or are **NOT** to be associated with the QAI logo as to imply listing of physical performance ratings.

ALTERATIONS:

None required.

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FACTORY TESTS:

WARNING! The factory tests specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.

INCOMING RAW MATERIALS

As a minimum, the following quality tests **must be performed** on incoming raw materials. The manufacturer **must document** all quality tests:

MATERIAL	TEST	FREQUENCY	SPEC/TOLERANCE
PVC Frames	Visual Inspection	Every Shipment	No visual damage.
	Overall and profile Dimensions	Every Shipment	Verify using a Tape measure (overall) and micrometer or caliper (profile) - within tolerances as per manufacturing specifications.
Aluminum Frames	Visual Inspection	Every Shipment	No visual damage.
	Dimensions and wall thickness.	Every Shipment	Verify using a Tape measure (overall) and micrometer or caliper (profile) - within tolerances as per manufacturing specifications.
Glazing Unit	Visual Inspection	Every Shipment	No visual damage. Verify product matches the description in this report.

FINAL QUALITY CONTROL CHECK

A final operational and visual inspection **must be conducted** on all products. In addition, the following inspection **must be documented** on 10% of finished product:

TITLE	TEST	PROCEDURE	SPEC/TOLERANCE
Overall Dimensions	Measurement	Measure product length, width and diagonal with tape measure.	Width and length within ± 1/16” of customer’s request. Difference between diagonal measurements ± 1/8”.
Aesthetic	Visual	Visual Inspection	No damage, scratches, dents or discolorations.
Operability	Operate	Open and close unit	Product must operate smoothly. Sash must seal tightly to main frame. Latches must fully engage keepers.
Correct Labels	Visual Inspection	Visual Inspection	Verify that the correct insulating glass unit is installed in the window. Verify that the correct temporary label is applied for the specific glazing option.

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CORNER WELD TEST

AAMA/WDMA/CSA 101/I.S.2/A440-11, Clause 9.3.6.2: Thermoplastic corner weld test.

This test is to be performed at the PVC frame manufactuer location listed above. Evidence of compliance must be forwarded to Total Façade Solution Inc. Compliance records must be available at time of inspection.

Note: *This test applies to welded or chemically bonded thermoplastic products only.*

THE CORNER WELD TEST MUST BE PERFORMED AT THE START OF EACH SHIFT. When primary structural sash, leaf, sliding door panel, or frame profile, or any other structural profile related to glazing retention and/or structural division of glazing lites within a common sash, leaf, sliding door panel, or frame is welded or chemically bonded, all corners representing all different profile combinations shall be tested.

Test specimens shall consist only of welded or bonded profiles of the base thermoplastic material. The corner samples shall be of sufficient size to be accommodated in the test fixture and shall be conditioned in accordance with Procedure A of ASTM D618 prior to testing. The corner sample shall be mounted in the test fixture as indicated in Figure 9.3. The load shall gradually be applied in the direction indicated until breakage of the corner occurs. Except for cellulosic composite materials, when loaded to failure, the break shall not extend along the entire weld line. For cellulosic composite materials, the following test results shall be reported:

(a) description of the break;
(b) location of the break; and
(c) load to cause breakage.

ASTM D618-08, Procedure A (Condition 40/23/50 for specimens 7 mm (0.25 in.) or under in thickness)**:** Samples shall be cooled (after welding) for 40 hours at 23 ± 2°Celsius and 50 ± 10% Relative Humidity.

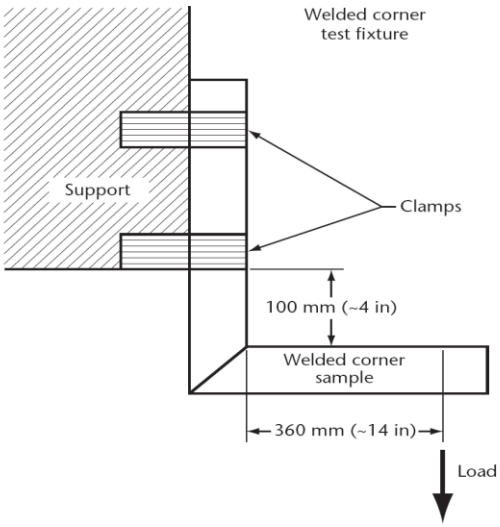

Figure 9.3
Set-up for thermoplastic corner weld test
(See Clauses 9.2.5, and 9.3.6.2 and Table 0.1.)

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DESCRIPTION:

Casement Window		
Frame:	Description	Extruded PVC Perimeter: Part no. 9700B
	Joints:	Corners are mitre cut and thermally welded.
Sash:	Description	Extruded PVC Rail and stile: Part no. 9601XB or 9601XD
	Joints:	Corners are mitre cut and thermally welded.
Sealant	Sealant:	Drawing no. 11 ASS-BAT-11
Weather-stripping:	Exterior:	Pile brush; T-slot retention; continuous at corners; PB-8328-187 (Schlegel)
	Intermediate:	Compression bulb; coextruded
	Interior:	Compression bulb; coextruded
	Frame:	None
Glazing Method:	Glazing:	Double glazed sealed unit; Total thickness: 21.8mm (0.86”) Exterior glass: C-A 2.8mm (0.11”) Interior glass: C-A 2.8mm (0.11”)
	Glazing stops:	Part no. 9604XC or 9604XB or 9604
	Spacer:	Aluminum
	Glazing seals:	Exterior face: (2) fins coextruded. Interior face: (2) fins coextruded
	Setting blocks:	(3) blocks at hinges stile, (2) blocks at keeper stile, (1) blocks at lower rail and (1) at top rail
Drainage:	Frame:	None
	Sash:	Drawing no. 08 MAC-9601XB-01
Hardware:	Locks:	Multi point lock : (1) 24-33 (Truth); (2) screws #10-24 x 9/16”
	Guide:	(4) 32931 (Truth); (2) screws #8 x 1” per guide
	Keepers:	(3) 32705 (Truth); (2) screws #6 x 3/8” per keeper
	Hinges / Snubbers:	Hinges: (2) 14-97 (Truth); (2) screws #7-#10 x 5/8” / Snubbers: (2 pairs) 21642 (Truth); (2) screws #8 x 8/8” (frame) and (2) screws #8 x 5/8” (sash)
	Rotary Operator/ Operator Track:	Rotary Operator: (1) 50-00 (Truth); (6) screws #7-#10 x 5/8” / Operator Track: (1) 11576-92 (Truth); (4) screws #7-#10 x 5/8”
	Stud bracket:	(1) 11277 (Truth); screws #7-#10 x 5/8”

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Awning Window		
Frame:	Description:	Extruded PVC
	Joints:	Corners are mitre cut and thermally welded.
	Sill, head and jambs:	Extrusions no. 9700B
Sash:	Description:	Extruded PVC Rail and stile: - Extrusions no. 9601B (option apparent flexible)
	Sealant:	Sealant at lower rail and continued at stiles on 150mm, before glazing stops installation. Also at junctions of exterior glazing seals, before sealed unit installation. Sealant on 150mm between glass member and stiles at centre of the sash
	Joints:	Corners are mitre cut and thermally welded.
Weather-stripping:	Exterior weatherstripping:	PB-8328-187 (Schlegal) at sash perimeter
	Intermediate weatherstripping:	PVC gasket coextruded with sash extrusion
	Interior weatherstripping:	PVC gasket coextruded with sash extrusion
Glazing Method:	Exterior Seal:	2 PVC soft legs, co-extruded with the sash extrusion (option apparent flexible). 1 PVC soft leg, co-extruded with the sash extrusion (option non apparent flexible).
	Interior Seal:	2 PVC soft legs, co-extruded with the glazing stop (option apparent flexible). 1 PVC soft leg, co-extruded with the glazing stop (option non apparent flexible).
	Setting Blocks:	2 blocks at stiles and 2 blocks at lower rail
	Glazing Stops:	Extrusions no.9604 (option apparent flexible) or 9604XB and 9604XC (option non apparent flexible)
Glazing:	Description	Double glazed sealed unit. Glass thickness: Please refer to glazing options list for approved glass sizes. Clear annealed glass; Inex spacer
Drainage:	Frame:	None
	Sash:	Drawing 08 ASS-MAC-9601-01
Hardware:	Locks:	(2) 24-25 (Truth)
	Keepers:	(2) 31376 (Truth)
	Hinges	(2) 13-17 (Truth)
	Operator:	(1) 51-00 (Truth)
	Hook:	(1) 11577.92 (Truth)

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Fixed Casement Window		
Frame:	Description:	Extruded PVC Assembly Drawing: 07 SOM-ASS-04 Perimeter: Part no. 9602 or 9702
	Joints:	Corners are mitre cut and thermally welded.
	Sealant:	See drawing no. 12 ASS-BAT-12
	Drainage:	See drawing no. 09 MAC-9602-01
Weather-stripping:	Frame:	None
Glazing Method:	Exterior Seal (glazing tape):	Dry sealed, 2 coextruded fins
	Interior Seal (glazing bead):	Dry sealed, 2 coextruded fins
	Setting Blocks:	(3) blocks at sill
Glazing:	Description	Double glazed sealed unit. Glass thickness: Please refer to glazing options list for approved glass sizes. Glass type: C-A for interior and exterior Aluminum spacer;
Glazing Method:	Exterior Seal:	(2) coextruded fins
	Interior Seal:	(2) coextruded fins
	Glazing Stops:	Part no. 9604 or 9604XB or 9604XC

See Appendix A for Drawings.

TESTS:

Sampling:

Test report were submitted by Uni-Tech Wiindows Manufacturer Inc. for evaluation. Testing was completed by CLEB Laboratory Inc. accredited to ISO 17025 by Standards Council of Canada (SCC), adreditation No. 28 for testing to CSA A440.2-14, "Fenestration Energy Performance" using the computer simulation method as being representative of the models covered in this report. All data provided has been verified by QAI before acceptance.

Results:

Tests are carried out on a specimen of specific dimensions. Product performance may be affected by variations in the windows dimensions, assembly details and installation method. The reader is advised to ensure product conformity with all details of this evaluation report.

Test procedures are designed to test the performance of the test specimen only and are not used to test the performance of the installation, particularly the perimeter sealant joint and the anchoring of the assembly. Products shall be installed in accordance with the manufacturer's recommended instruction.

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The following table summarizes the test report numbers and size of test specimens used for Thermal Simulation to CSA A440.2-14.

Product Series	Glass / Grille Option #'s:	CSA A440.2-14 Thermal Sim. Test Report No.	NAFS 2011 Test Report No.	Test Size (W x H)
Casement Window	5 Glass Options	AT-00738 Rev.1 dated March 28, 2019	AI-03741-F1 Rev. 2 dated March 28, 2017	600 mm x 1500 mm
Awning Window	5 Glass Options	AT-00739 Rev.1 dated March 28, 2019	AI-03741-G1 Rev. 2 dated March 29, 2017	1500 mm x 600 mm
Low Fixed Window	9 Glass Options	AT-00740 Rev.1 dated March 28, 2019	AI-03741-B1 Rev. 3 dated March 9, 2017	1200 mm x 1500 mm
Horizontal Sliding Window	3 Glass Options	AT-00741 Rev.1 dated March 28, 2019	AI-04211-E1 Rev. 3 dated June 7, 2017	1500 mm x 1200 mm
Vertical Sliding Window	3 Glass Options	AT-00742 Rev.1 dated March 28, 2019	AI-04211-A1 Rev. 3 dated June 7, 2017	1200 mm x 1500 mm
Hybrid Casement Window	5 Glass Options	AT-00743 Rev.1 dated March 28, 2019	AI-03741-X1 Rev. 1 dated March 29, 2017	600 mm x 1500 mm

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Product Testing Summary: Testing was conducted in accordance with CSA A440.2-14 with the results shown below.

Notes:

- *For combination windows, each individual window style must be evaluated by QAI for the entire product to be labeled.*
- *Tempered glass may be used instead of clear float glass without an effect on the energy performance of the product.*
- *Clear obscure glass may be used instead of clear float glass without an effect on the energy performance of the product.*

The manufacturer purchases sealed insulated glass units from Toronto Glass (Heat Seal) Ltd., IGMAC #021035G and Vitro Flat Glass Canada Inc., IGMAC #021053G and #021054G.

Vinyl Casement Window

Model Code	Number of Layers	Exterior Layer (mm)	Middle Layer (mm)	Interior Layer (mm)	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Cavity 1 (mm)	Cavity 2 (mm)	Spacer Bar Type	Visual Transmittance Total Product	Product U-Value (W/m2K)	Product SHGC	Energy Rating
UTM-VCAS-3,CL-16AR95TG-3,SB60(3)	2	3 Clear	-	3 Solarban 60	-	0.035	-	-	16.1 95% Argon	-	IU	0.48	1.50	0.33	26
UTM-VCAS-3,SB60(2)-16AR95TG-3,S700(4)	2	3 Solarban 60	-	3 Sungate 700	0.035	-	0.142	-	16.1 95% Argon	-	IU	0.42	1.30	0.25	26
UTM-VCAS-3,CL-16AR95TG-3,ENAD(3)	2	3 Clear	-	3 Energy Advantage Low-E	-	0.164	-	-	16.1 95% Argon	-	TG	0.50	1.66	0.49	32
UTM-VCAS-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)	3	3 Clear	3 Solarban 60	3 Solarban 60	-	0.035	-	0.035	9.9 95% Argon	9.9 95% Argon	IU	0.39	1.07	0.27	32
UTM-VCAS-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)	3	3 Clear	3 Solarban 70xl	3 Solarban 70xl	-	0.018	-	0.018	9.9 95% Argon	9.9 95% Argon	IU	0.30	1.05	0.20	29
UTM-VCAS-3,CL-16AR95TG-3,7036(3)	2	3 Clear	-	3 Climaguard 70/36	-	0.164	-	-	16.1 95% Argon	-	TG	0.33	1.49	0.46	26

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Vinyl Awning Window

Model Code	Number of Layers	Exterior Layer (mm)	Middle Layer (mm)	Interior Layer (mm)	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Cavity 1 (mm)	Cavity 2 (mm)	Spacer Bar Type	Visual Transmittance Total Product	Product U-Value (W/m2K)	Product SHGC	Energy Rating
UTM-VAWN-3,CL-16AR95TG-3,SB60(3)	2	3 Clear	-	3 Solarban 60	-	0.035	-	-	16.1 95% Argon	-	IU	0.48	1.52	0.33	25
UTM-VAWN-3,SB60(2)-16AR95TG-3,S700(4)	2	3 Solarban 60	-	3 Sungate 700	0.035	-	0.142	-	16.1 95% Argon	-	IU	0.42	1.34	0.25	24
UTM-VAWN-3,CL-16AR95TG-3,ENAD(3)	2	3 Clear	-	3 Energy Advantage Low-E	-	0.164	-	-	16.1 95% Argon	-	TG	0.50	1.68	0.49	31
UTM-VAWN-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)	3	3 Clear	3 Solarban 60	3 Solarban 60	-	0.035	-	0.035	9.9 95% Argon	9.9 95% Argon	IU	0.39	1.08	0.27	31
UTM-VAWN-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)	3	3 Clear	3 Solarban 70xl	3 Solarban 70xl	-	0.018	-	0.018	9.9 95% Argon	9.9 95% Argon	IU	0.30	1.06	0.20	28
UTM-VAWN-3,CL-16AR95TG-3,7036(3)	2	3 Clear	-	3 Climaguard 70/36	-	0.164	-	-	16.1 95% Argon	-	TG	0.33	1.51	0.46	25

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Vinyl Low Fixed Window

Model Code	Number of Layers	Exterior Layer (mm)	Middle Layer (mm)	Interior Layer (mm)	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Cavity 1 (mm)	Cavity 2 (mm)	Spacer Bar Type	Visual Transmittance Total Product	Product U-Value (W/m2K)	Product SHGC	Energy Rating
UTM-VLFIX-3,CL-16AR95TG-3,SB60(3)	2	3 Clear	-	3 Solarban 60	-	0.035	-	-	16.1 95% Argon	-	IU	0.57	1.52	0.39	29
UTM-VLFIX-3,SB60(2)-16AR95TG-3,S700(4)	2	3 Solarban 60	-	3 Sungate 700	0.035	-	0.142	-	16.1 95% Argon	-	IU	0.49	1.28	0.29	29
UTM-VLFIX-4,CL-16AR95TG-4,SB60(3)	2	4 Clear	-	4 Solarban 60	-	0.035	-	-	14.6 95% Argon	-	IU	0.56	1.51	0.38	29
UTM-VLFIX-5,CL-16AR95TG-5,SB60(3)	2	5 Clear	-	5 Solarban 60	-	0.035	-	-	13.0 95% Argon	-	IU	0.56	1.49	0.38	29
UTM-VLFIX-4,SB60(2)-16AR95TG-4,S700(4)	2	4 Solarban 60	-	4 Sungate 700	0.035	-	0.142	-	14.6 95% Argon	-	IU	0.49	1.28	0.29	29
UTM-VLFIX-5,SB60(2)-16AR95TG-5,S700(4)	2	5 Solarban 60	-	5 Sungate 700	0.035	-	0.142	-	13.0 95% Argon	-	IU	0.48	1.27	0.28	28
UTM-VLFIX-3,CL-16AR95TG-3,ENAD(3)	2	3 Clear	-	3 Energy Advantage Low-E	-	0.164	-	-	16.1 95% Argon	-	TG	0.59	1.72	0.58	36
UTM-VLFIX-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)	3	3 Clear	3 Solarban 60	3 Solarban 60	-	0.035	-	0.035	9.9 95% Argon	9.9 95% Argon	IU	0.46	1.02	0.31	36
UTM-VLFIX-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)	3	3 Clear	3 Solarban 70xl	3 Solarban 70xl	-	0.018	-	0.018	9.9 95% Argon	9.9 95% Argon	IU	0.36	1.00	0.23	31
UTM-VLFIX-3,CL-16AR95TG-3,7036(3)	2	3 Clear	-	3 Climaguard 70/36	-	0.164	-	-	16.1 95% Argon	-	TG	0.39	1.52	0.55	29

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Vinyl Horizontal Sliding Window

Model Code	Number of Layers	Exterior Layer (mm)	Middle Layer (mm)	Interior Layer (mm)	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Cavity 1 (mm)	Cavity 2 (mm)	Spacer Bar Type	Visual Transmittance Total Product	Product U-Value (W/m2K)	Product SHGC	Energy Rating
UTM-VHS-3,CL-16AR95TG-3,SB60(3)	2	3 Clear	-	3 Solarban 60	-	0.035	-	-	16.1 95% Argon	-	IU	0.55	1.59	0.38	26
UTM-VHS-3,SB60(2)-16AR95TG-3,S700(4)	2	3 Solarban 60	-	3 Sungate 700	0.035	-	0.142	-	16.1 95% Argon	-	IU	0.48	1.36	0.28	26
UTM-VHS-3,CL-16AR95TG-3,ENAD(3)	2	3 Clear	-	3 Energy Advantage Low-E	-	0.164	-	-	16.1 95% Argon	-	TG	0.58	1.78	0.57	33
UTM-VHS-3,CL-16AR95TG-3,7036(3)	2	3 Clear	-	3 Climaguard 70/36	-	0.164	-	-	16.1 95% Argon	-	TG	0.53	1.58	0.38	27

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Vinyl Vertical Sliding Window

Model Code	Number of Layers	Exterior Layer (mm)	Middle Layer (mm)	Interior Layer (mm)	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Cavity 1 (mm)	Cavity 2 (mm)	Spacer Bar Type	Visual Transmittance Total Product	Product U-Value (W/m2K)	Product SHGC	Energy Rating
UTM-VVS-3,CL-16AR95TG-3,SB60(3)	2	3 Clear	-	3 Solarban 60	-	0.035	-	-	16.1 95% Argon	-	IU	0.55	1.59	0.38	26
UTM-VVS-3,SB60(2)-16AR95TG-3,S700(4)	2	3 Solarban 60	-	3 Sungate 700	0.035	-	0.142	-	16.1 95% Argon	-	IU	0.48	1.35	0.28	26
UTM-VVS-3,CL-16AR95TG-3,ENAD(3)	2	3 Clear	-	3 Energy Advantage Low-E	-	0.164	-	-	16.1 95% Argon	-	TG	0.58	1.78	0.57	33
UTM-VVS-3,CL-16AR95TG-3,7036(3)	2	3 Clear	-	3 Climaguard 70/36	-	0.164	-	-	16.1 95% Argon	-	TG	0.53	1.58	0.38	26

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Hybrid Casement Window

Model Code	Number of Layers	Exterior Layer (mm)	Middle Layer (mm)	Interior Layer (mm)	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Cavity 1 (mm)	Cavity 2 (mm)	Spacer Bar Type	Visual Transmittance Total Product	Product U-Value (W/m2K)	Product SHGC	Energy Rating
UTM-HCAS-3,CL-16AR95TG-3,SB60(3)	2	3 Clear	-	3 Solarban 60	-	0.035	-	-	16.1 95% Argon	-	IU	0.48	1.56	0.33	24
UTM-HCAS-3,SB60(2)-16AR95TG-3,S700(4)	2	3 Solarban 60	-	3 Sungate 700	0.035	-	0.142	-	16.1 95% Argon	-	IU	0.42	1.36	0.24	24
UTM-HCAS-3,CL-16AR95TG-3,ENAD(3)	2	3 Clear	-	3 Energy Advantage Low-E	-	0.164	-	-	16.1 95% Argon	-	TG	0.49	1.72	0.49	30
UTM-HCAS-3,CL-16AR95TG-3,SB60(3) -16AR95TG-3,SB60(5)	3	3 Clear	3 Solarban 60	3 Solarban 60	-	0.035	-	0.035	9.9 95% Argon	9.9 95% Argon	IU	0.39	1.13	0.27	30
UTM-HCAS-3,CL-16AR95TG-3,SB70(3) -16AR95TG-3,SB70(5)	3	3 Clear	3 Solarban 70xl	3 Solarban 70xl	-	0.018	-	0.018	9.9 95% Argon	9.9 95% Argon	IU	0.30	1.11	0.20	27
UTM-HCAS-3,CL-16AR95TG-3,7036(3)	2	3 Clear	-	3 Climaguard 70/36	-	0.164	-	-	16.1 95% Argon	-	TG	0.46	1.55	0.33	25

Notes: Surfaces are numbered from Exterior (1) to Interior.
All glazing surface emissivities are assumed to be 0.840 unless otherwise stated.
The gas fill method is dual probe with 95% Argon fill.
Spacer Type: IU = Intercept Ultra Spacer Bar.
TG = Technoform Spacer Bar.
Model Code Outline is available on the following page.

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Thermal Simulation Model Codes

Model codes submitted to NRCan for Energy Star must be no more than 60 characters with no spaces and no model code can be the same as another in their database.

Company[1]	Product Series and Type[2]	Glass thickness, coating type and surface applied[3]	Cavity width, gas and % fill, spacer bar type[4]	Glass thickness, coating type and surface applied[5]	Cavity width, gas and % fill, spacer bar type[6]	Glass thickness, coating type and surface applied[7]	Reinfor-cement[8]	Dividers[9]
XXXX	XXXXX	X,XXX(X)	XXXXXX	X,XXX(X)	XXXXXX	X,XXX(X)	X	X

All Sections are separated by dashes, however if a code is over 60 characters remove the two dashes between the glazing layers and cavities. If a section is not needed such as the third glazing layer or the second cavity, that section will be deleted.

[1] Company code must be unique for each of our clients.

[2] Company's product series and type separated by dash. Exclude series if there is no product series or family.

Product Type:

- FC – Fixed Casement
- PC – Picture Window
- FT – Fixed Tilt & Turn
- CA – Casement
- AW – Awning
- TT – Tilt & Turn
- SS* – Single (Horizontal) Slider
- SST – Single (Horizonal) Slider Tilt
- SSL – Single (Horizonal) Slider Liftout
- DS* – Double (Horizontal) Slider
- DST – Double (Horizontal) Slider Tilt
- DSL – Double (Horizontal) Slider Liftout
- SH – Single Hung
- DH – Double Hung
- SKY – Skylight
- GW – Glazing Wall
- PD – Patio Door (Folding Door)
- Lift and Slide Door

*- use this type if client does not produce both tilt and liftout versions

[3,5,7] Glass thickness (mm), Low-E coating type, surface applied to (in brackets).

- if the glass is clear indicate the size followed by CL: 3,CL
- if the glass has a Low-E coating, indicate the size followed by coating type and surface applied to in brackets: 3,8070(2)

[4,6] Cavity is represented by size (mm rounded to whole number), then Gas Type, % fill, and spacer bar type: 8AR90TG or 13AR95SS

Note: If both cavity sizes, Gas Types, % fill, and spacer bar types are identical, and the number of characters is outside the 60 character limit, this portion of the code may only appear once following the last Glass Thickness/Coating Type/Surface Applied portion of the code.

- Argon = AR
- Air = AIR
- Krypton = KR
- Xenon = XE

Spacer bar is represented by two letters for the name of the spacer, as indicated in the notes section of the results table.

- XL = Cardinal XL Edge® Spacer Bar.
- EN = Cardinal Endur™ IG Spacer Bar.
- TG = Technoform Glass Insulation Spacer Bar
- DL = Quanex Duralite® Warm-Edge Spacer Bar
- SS = Quanex Super Spacer® Standard Spacer Bar
- SE = Quanex Super Spacer® Premium Enhanced Spacer Bar
- SP = Quanex Super Spacer® Premium Plus Enhanced Spacer Bar
- IU = Intercept® ULTRA Spacer Bar

[8] Reinforcement in the sash or frame is indicated by 'R'. Exclude this section if there is no reinforcement.

[9] Dividers are represented with either 'G' for Simulated Divider and 'T' for True Divider, followed by <1 or ≥1, as applicable. Exclude this section if there is no divider. If more than one of the same type, use G1/T1 and G2/T2, followed by <1 or ≥1, as applicable.

Examples:

ABC Company Ltd., 4000XL Series Casement Window, with 3mm Cardinal 366 on surface 2, 12.7mm 90% Argon cavity with a TGI Spacer Bar, 3mm Clear glass = [ABC-4XLCA-3,366(2)-13AR90TG-3,CL]

Build Your Own Window Ltd., DIY 500 Series Single (Horizontal) Slider with 3mm Cardinal 366 on surface 2, 4mm Cardinal 270 on surface 3 and 3mm Cardinal i89 on surface 6 with 9.5mm cavities 95% Argon (cavity 1) and Air (cavity 2) with Superspacer Standard and 1.5" wide True Divided Lites = [BYOW-DIY5SS-3,366(2)-10AR95SS-4,270(3)-10AIRSS-3,i89(6)-T≥1]

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CONCLUSION:

Products were evaluated to the applicable requirements of CSA A440.2-14 “Fenestration Energy Performance” and are acceptable for listing.

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Date	Version	Change Description	Initials
March 10, 2014	Original Report	Modelling of Casement, Awning and Fixed Casement Window with two glazing optionsa each	TJ
May 21, 2014	Edition 2	Addition of: Double Hung and Double Slider with two glazing options each.	TJ
January 15, 2019	Edition 3	Glazing options updated to CSA A440.2-14 added for Casement, Awning, Low Fixed, Single Slider, Single Hung and Hybrid Casment Windows	ND
April 26, 2019	Edition 4	Addition of: Single glazing option to all models	ND

**********<END OF REPORT>********

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