

POLYTECH PRODUCTS LTD

TEST REPORT

PRODUCT SERIES & TYPE

Vinyl Dual Action Composite Window

SCOPE OF WORK

TESTING OF A DUAL ACTION COMPOSITE WINDOW IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

- ASTM E283-04(2012)
- ASTM E547-00(2016)
- ASTM E330/E330M-14

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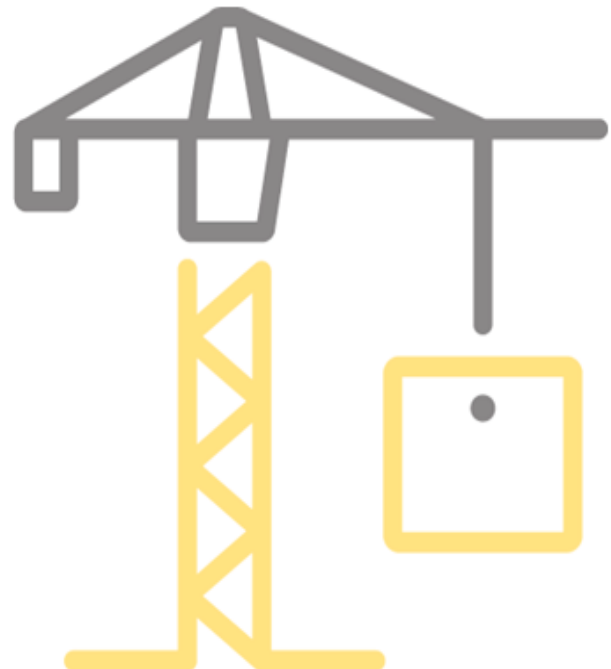
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October 16, 2020

REPORT ISSUED TO

Polytech Products Ltd.
8819 Highway 105 RR3
Baddeck, NS B0E 1B0
Canada

SECTION 1**SCOPE**

Intertek Building & Construction (B&C) was contracted by Polytech Products Ltd to perform testing on their Dual Action composite Vinyl window in accordance with the following standards and methods:

- ASTM E283-04(2012) "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen".
- ASTM E331-00(2016) "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Static Air Pressure Difference"
- ASTM E330/E330M-14 "Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference"

Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek test facility in Mississauga, Ontario. This evaluation was started on April 14, 2020 and completed on April 15, 2020.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.


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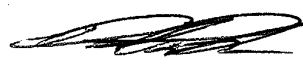
SECTION 2

SUMMARY OF RESULTS

Manufacturer	Polytech Products Ltd. 8819 Highway 105 RR3 Baddeck, NS B0E 1B0 Canada
Type:	Vinyl Dual Action Composite Window
Test Size:	1800 x 1500 mm
Test Levels:	Design Pressure = ± 2880 Pa (± 60.15 psf) Structural Pressure = ± 4320 Pa (± 90.23 psf) Water Penetration Test Pressure = 720 Pa (15.04 psf)
Test Completed Date:	April 15, 2020

For INTERTEK B&C:

COMPLETED	
BY:	Edsel Lopez
TITLE:	Technical Analyst Building & Construction
SIGNATURE:	
DATE:	10/16/2020

REVIEWED	
BY:	David Park
TITLE:	Reviewer Building & Construction
SIGNATURE:	
DATE:	10/16/2020

SECTION 3

OBJECTIVE

Intertek Testing Services NA Ltd. (Intertek) has conducted testing for Polytech Products Ltd on a 1800 x 1500 mm Vinyl Dual action Composite Window. Testing was conducted in accordance with following standard / specification:

- ASTM E283-04(2012)
- ASTM E331-00(2016)
- ASTM E330/E330M-14

SECTION 4

TEST SPECIMEN DESCRIPTION

Manufacturer Information	Polytech Products Ltd. 8819 Highway 105 RR3 Baddeck, NS B0E 1B0 Canada
Sample Type	Vinyl Dual Action Combination Window
Installation	<ul style="list-style-type: none"> • The frame/sash assembly was attached to a 2 x 10 in. wood buck and fastened with #8 x 3" wood screws spaced approximately 450 mm along the exterior perimeter of the buck. The perimeter joint between the window frame and wood buck on the interior was sealed with a bead of caulking at the exterior. The test mock-up was built by Polytech Products
Frame	<ul style="list-style-type: none"> • Overall Size: • Width – 1800mm • Height – 1500 mm • Extruded rigid vinyl frame members with mitered and welded corners • Reinforcement :16 GA galvanized rectangular box section installed in each frame member cavity and fastened with 4 mm diameter by 16 mm length metal screws spaced at approx. 250 mm along the perimeter. • Screen track kit installed to exterior of the frame jamb and fastened with five #6 - 20mm stainless steel screws spaced at 250 mm.
Mullion	<ul style="list-style-type: none"> • Extruded rigid vinyl with mitred and welded corners integrated with the frame and installed at the center. • Reinforcement: 16 GA galvanized rectangular box section installed in the full length of the mullion cavity and fastened with one #6 x 20 mm stainless steel screws on both cavity interface.

	<ul style="list-style-type: none"> An extruded rigid vinyl screen track was bonded to the exterior interface of the mullion
(Dual Action Window) 1&2	<ul style="list-style-type: none"> Extruded rigid vinyl with mitred and welded corners. Sash Size: Width:840 mm Height:1420 mm The sash top and bottom rails were reinforced with a galvanized 16 GA J-section along the entire length of the rails and fastened with two 4 mm diameter by 16 mm self-drilling screws spaced at 450 mm. The stiles were reinforced with galvanized 16 GA J-section along the entire length of the stiles and fastened with nine 4 mm diameter by 16 mm self-drilling screws spaced at approx. 660 mm. Deflector kit was installed at the exterior bottom rail interface and fastened with five #6-20 mm stainless steel screws
Locks and Hardware	<p>Window 1 & 2</p> <ul style="list-style-type: none"> Lock: A locking handle was fastened to a cavity along the lock stile through an aluminium backing plate and was fastened with two # 10 X 2" flat head stainless steel machine screws. The lock engaged a multipoint latch system that engages to nine metal keepers that are located at the jambs, header and sill. The handle was installed at the interior face of the sash at 610 mm from the underside of the sash. Keepers: Eight metal keepers are fastened to the interior sash with three #7 x 1 1/4" flat head stainless steel screw. One at the header located at 300 mm from the interior weld of header and lock jamb, three along the lock jamb/mullion spaced at 400 mm and 530 mm respectively, two at hinge jamb spaced at 670mm and two at the sill approximately 450 mm apart Tilt and turn hardware was installed at the interior mullion interface. Hinge was installed at the top corner of the hinge jamb. A hinge arm 430 mm in length is attached to the multipoint system at the top rail of the sash rail
Weather-stripping	<ul style="list-style-type: none"> Frame: The exterior perimeter was single weather-stripped with an inserted bulb seal at the outermost kerf facing the interior of each window. Sash: The interior perimeter on both windows were single weather-stripped with an inserted bulb seal at the innermost kerf of the sash facing the exterior. The glazing cavity is weather stripped with a bulb seal at the kerf. Mullion: The exterior cavity was single weather stripped with an inserted flexible bulb seal at the outermost kerf facing the interior where it meets both windows.
Drainage	<ul style="list-style-type: none"> The top rail was vented by two 5mm x 25 mm slots spaced at 450 mm from the centre of the rail at the glazing cavity. The bottom rail was drained by two 5mm x 25mm slots spaced at approximately 450 mm apart measured at the centre of bottom rail glazing cavity. The top rail is vented by two 5mm x 25 mm slot at the exterior interface of the operable sash and spaced at 450 mm from the centre of the top rail. The bottom rail is drained by two 5mm x 25 mm slot at the exterior interface of the operable sash spaced at 450 mm from the centre of the bottom rail. The interior header cavity was vented by two 5mm x 25 mm slots spaced at 1380

	<p>mm from the centre of the header.</p> <ul style="list-style-type: none"> • The interior sill track was drained to a forward cavity by two 5 mm x 25 mm slots that are spaced at 1480 mm O.C. • The sill cavity was drained to the exterior by two slots, measuring 5 mm x 25 mm, spaced at 1280 mm on centre. The exterior drain slots were fitted with eyelid weep covers.
Glazing & Glazing Methods	<ul style="list-style-type: none"> • The IG (insulating glass) unit was dry glazed from the interior on the bulb seal of the glazing leg at the top rail and stiles. The bottom rail was sealed with silicone all throughout its length and upwards of 100 mm to both stiles. Glazing leg corners were welded prior to installation of the glass. • Two setting blocks measuring 100 x 30 x 5 mm supported the IG unit at the bottom rail located at 520 mm O.C. • One setting blocks measuring 100 x 30 x 5 mm supported the IG unit at the top rail located at 100 mm from the adjacent weld at the mullion. • Two setting blocks measuring 100 x 30 x 5 mm supported the IG unit at the stiles spaced approximately 600 mm apart and located 100 mm of the adjacent weld at the top rail and lock stile. • Two setting blocks measuring 100 x 30 x 5 mm supported the IG unit at the stiles spaced approximately 600 mm apart and located 100 mm of the adjacent weld at the bottom rail and hinge stile. • Factory sealed glazing unit having two sheets of nominally thick 4 mm glass with a 16 mm wide gap and a spacer. • Overall IG thickness was 24 mm.
Insect Screen	<ul style="list-style-type: none"> • Frame: Roll formed aluminium members supported by four plastic corners • Mesh: Fiberglass mesh retained by plastic spline • Installation: Screen stile engaged a track along the frame jambs and mullion <p>Screen Size: Width: 850 mm Length:1460 mm</p>
Drawings	<ul style="list-style-type: none"> • Drawings and Bill of Materials in the Appendix

SECTION 5

TESTING AND EVALUATION METHODS

AIR LEAKAGE RESISTANCE

The Air Leakage Resistance test was performed in accordance with ASTM E283-04(2012), *“Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen”* (ASTM E283). Air infiltration and exfiltration tests were performed using test pressures of 75 Pa (1.57 psf). The maximum air leakage rate was calculated and compared to the allowable air leakage.

WATER PENETRATION RESISTANCE

A fifteen-minute Water Penetration Resistance test was performed in accordance with ASTM E331-00(2016) *“Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Static Air Pressure Difference”* (ASTM E331). The test was performed using the specified pressure differential and a water spray rate of at least 204 L/m² per hour (5.0 U.S. gal/ft² per hour). The test consisted of an uninterrupted pressure applied for 15 minutes, during which the water spray was continuously applied.

UNIFORM LOAD DEFLECTION

The Uniform Load Deflection tests were conducted in accordance with ASTM E330/E330M-14 *“Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference”* (ASTM E330), Procedure A. The tests were performed in both the positive and negative directions. After a 10 second preload (50% of the test load), followed by 1 minute with the pressure released, the tests were conducted at the specified test pressure for a period of 10 seconds. Deflections were measured at the mid-span and at the ends. The end deflections were averaged and subtracted from the mid-span deflection (to eliminate deflections caused by movement at the ends of the structural supporting members). Polyethylene film was used during the positive wind pressure sequences.

UNIFORM LOAD STRUCTURAL

The Uniform Load Structural tests were conducted in accordance with ASTM E330/E330M-14 *“Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference”* (ASTM E330), Procedure A. After a 10 second preload (50% of test load), followed by 1 minute with the pressure released, the sample was subjected to a Uniform Load Structural test using a specified test pressure for a time of 10 seconds. The test was performed in both the positive and negative directions. After the test loads were released, the permanent deflections were recorded, and the specimen was inspected for failure or permanent deformation of any part of the system that would cause any operational malfunction. Polyethylene film was used during the positive wind pressure sequences.

DEVIATION FROM STANDARD METHOD

There were no noted deviations from the test standards used in the evaluation reported herein.

SECTION 6 TEST EQUIPMENT

Equipment used during testing is listed as follows:

Test	Equipment	Intertek Asset#	Cal. Due
Air Leakage Resistance	Laminar Flow Element	280-01-0171	Apr. 28, 2020
	Pressure Transducer	280-01-0961	Dec. 19, 2020
Water Penetration	Spray Rack	273-01-0974	May 4 2020
Uniform Load Deflection / Structural	String Pots	280-01-0956A	June 20, 2020
		280-01-0956B	June 20, 2020
		280-01-0956C	June 20, 2020
		280-01-0956D	June 20, 2020
		280-01-0956E	June 20, 2020
		280-01-0956F	June 20, 2020
		280-01-0956G	June 20, 2020

SECTION 7 RESULTS AND OBSERVATIONS

AIR LEAKAGE RESISTANCE

Air Infiltration, +75 Pa	
Net infiltration:	0.02 L/s
Window Area:	2.70 m ²
Infiltration rate:	0.01 L/s·m ²
Air Exfiltration, -75 Pa	
Net exfiltration:	0.01 L/s
Window Area:	2.70 m ²
Exfiltration rate:	0.00 L/s·m ²

October 16, 2020

The window system achieved the overall air leakage results as noted above when tested in accordance to ASTM E283.

WATER PENETRATION RESISTANCE

During the 15-minute test period, there was no water leakage observed, nor was there trapped water in the window assembly following completion of the test. The window system **passed** at a pressure differential of 720 Pa (15.04 psf) under ASTM E331.

UNIFORM LOAD TEST

Uniform Load Deflection Tests at Design Pressure						
Member	Top Rail		Lock Stile		Mullion	
Span Length (L)	770 mm		1330 mm		1450 mm	
Allowable Deflection (L/175)	4.40 mm		7.60 mm		8.29 mm	
Test Pressure	Positive	Negative	Positive	Negative	Positive	Negative
	2880 Pa	2880 Pa	2880 Pa	2880 Pa	2880 Pa	2880 Pa
Maximum Net Deflection	1.82	2.21	8.91	9.13	8.34	8.98
Post-test Details	After the test loads were released, the window was inspected and there was found to be no failure or permanent deformation of any part of the window system.					

Uniform Load Structural Test						
Member	Top Rail		Lock Stile		Mullion	
Span Length (L)	770 mm		1330 mm		1450 mm	
Allowable Deflection (L x 0.3%) Length	2.31 mm		3.99 mm		4.35 mm	
Test Pressure	Positive	Negative	Positive	Negative	Positive	Negative
	4320 Pa	4320 Pa	4320 Pa	4320 Pa	4320 Pa	4320 Pa
Net Residual Deflection (mm)	0.05	0.06	0.11	0.12	0.09	0.11
Post-test Details	After the test loads were released, the window was inspected and there was found to be no failure or permanent deformation of any part of the window system.					

The window system achieved the above loads when tested in accordance to ASTM E330.

SECTION 8
CONCLUSION

The Vinyl Dual Action Composite Window submitted by Polytech Products Ltd tested and described within this report, attained the following performance level. Results are reported herein.

Manufacturer	Polytech Products Ltd. 8819 Highway 105 RR3 Baddeck, NS B0E 1B0 Canada
Type:	Vinyl Dual Action Composite Window
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Test Levels:	Design Pressure = ± 2880 Pa (± 60.15 psf) Structural Pressure = ± 4320 Pa (± 90.23 psf) Water Penetration Test Pressure = 720 Pa (15.04 psf)
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