

UNITIZED WINDOW
WALL SYSTEM

THE EVOLUTION OF THE
UNITIZED WINDOW SYSTEMS
FOR MID-RISE AND HIGH-RISE
RESIDENTIAL BUILDINGS



BLACKLINE

A L U M I N U M

Blackline Aluminum Marketing Department





**LIVING BETTER BY
BUILDING BETTER**



INNOVATIVE
**DESIGN
SOLUTIONS**

FOR HIGH-RISE CONSTRUCTIONS



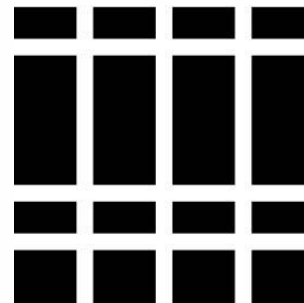
ABOUT US

OUR MISSION

The mission of Blackline Aluminum is to design and produce window wall solutions of superior quality to create resilient buildings for the communities we serve.



Blackline Aluminum delivers innovative, high-performance window wall systems to high-rise developers by combining experienced industry leaders, modern designs, and a state-of-the-art facility to create windows of unmatched durability. At Blackline Aluminum, process and consistency remain our guiding principles. Each step of our manufacturing process, from product design to final installation, is carefully considered and reconsidered to ensure we seize on every opportunity to improve our design and execution. The result is a product with every innovation and solution available that can outperform and outlast any competing system available in the industry.



CORE VALUES

"The industry never stops innovating and we intend to compete with the best in the world when it comes to our product design, manufacturing process and delivery method."

Mohammad Ghadaki
Founder & President of Blackline Aluminum

"We are proud to be part of the Blackline equipment assembly and value the opportunity to work together with their committed team."

Jerry Schwabauer
VP Sales & Marketing for Azon

"We expect the quality of the Blackline Series 6500 window wall systems being installed at our sites to translate into major savings for future residents through reduced maintenance and longer life spans."

Ali Mesgarzadeh
President Life Construction Inc.

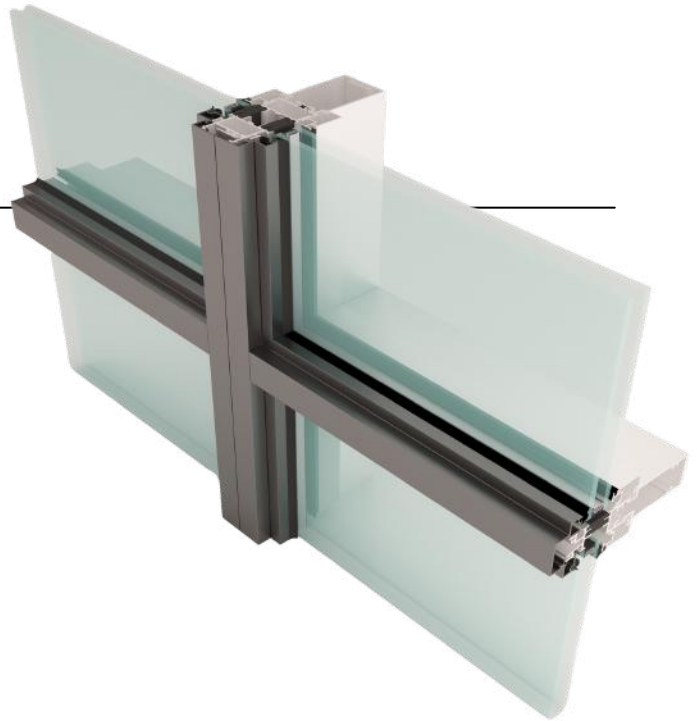
"We are impressed by the results of Blackline's series 6500 thermal performance and look forward to their future innovations. They are changing the way windows are designed and manufactured in Canada."

Shadi Aghaei
Vice-President, Times Group Corporation

The Blackline Aluminum philosophy of innovation is careful, methodical implementation of improvements until the quality and performance of our product reflects our deep commitment to serve our clients and communities. The pursuit for this new standard for our industry never rests.



PRODUCT



WHAT MAKES 6500 SERIES UNIQUE?

Structurally Superior

A new Polyurethane pour and de-bridge thermal break mean industry-leading strength and durability. There is no need for support up to 14 feet, and minimal support up to 16 feet. Proving its superior design, strength, and quality, This strength allows us to install 6500 series up to 75 storeys.

A Neat Façade & More Interior Space

Due to the unique design of the 6500 series the glass sits further out the frame thus achieving one plain of view from exterior. The benefits of this design just don't end there, according to BOMA standards we are able to achieve more interior space which can be beneficial both for the builders and future consumers.

Higher Energy Efficiency

The system allows up to 4" rigid insulation at select locations to meet or beat OBC specifications as needed. 6500 can be spaced with Shadow box, double glaze and even triple glaze to meet all required energy models based on project requirements.

INTRODUCTION

Easy Maintenance and Repair On-Site

The unique design of profiles and pressure caps accompanied by EPDM and silicone gaskets allow the 6500 Series to be glazed and de-glazed from the interior or exterior.

Greater Design Freedom

The innovative exterior pressure-plate covers on the 6500 Series can be extruded in any desired shape to accommodate the extension of your design style further than ever before.

Keep Your Projects on Schedule

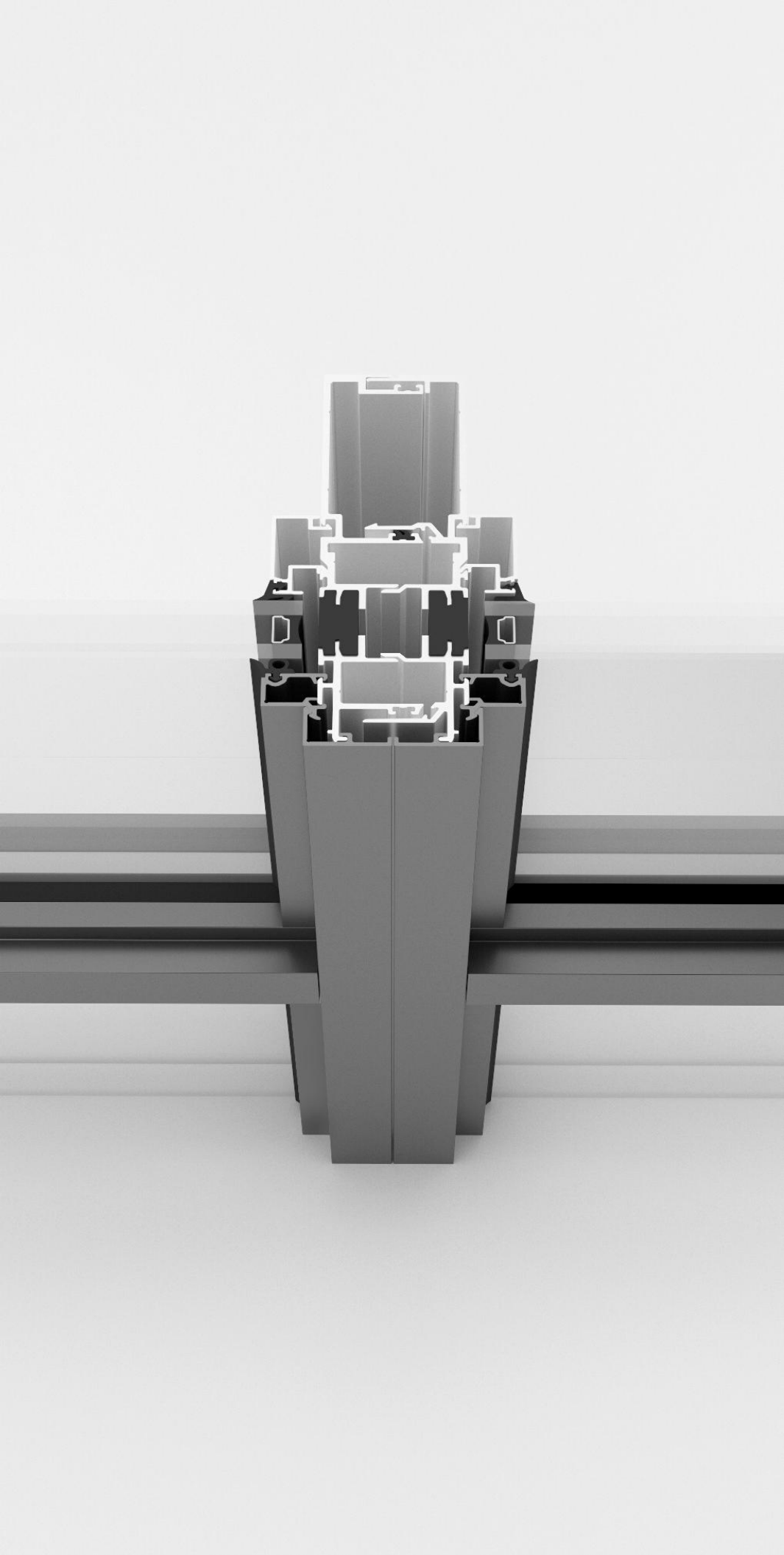
A fully equipped vertical glass line with a 120-pack storage system and an ultramodern panel department means faster production times, higher quality, and superior performance specifications. Our facility is modeled to be automated and our vertically intergraded line allows for high efficiency out put.



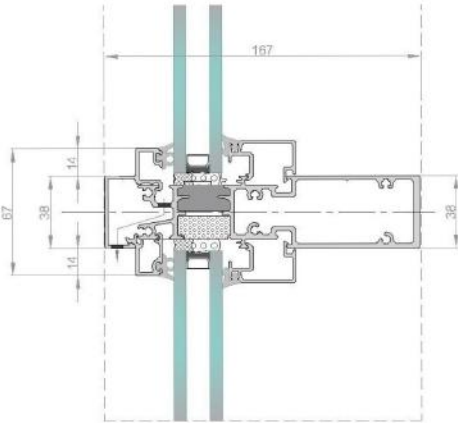
14 FEET TALL WINDOWS WITHOUT REINFORCEMENT



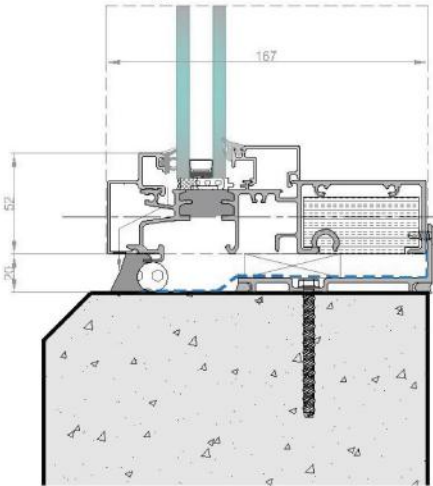
**6500
SERIES
PRODUCT**



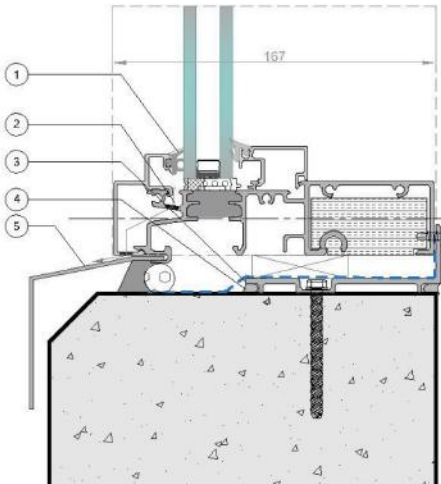
6500 SERIES



Transom Detail @ Vision Glass

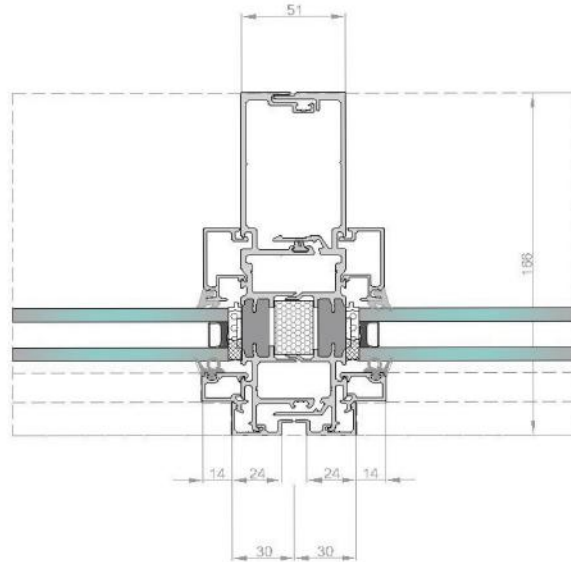


Sill Detail with Starter (No Sill Flashing)

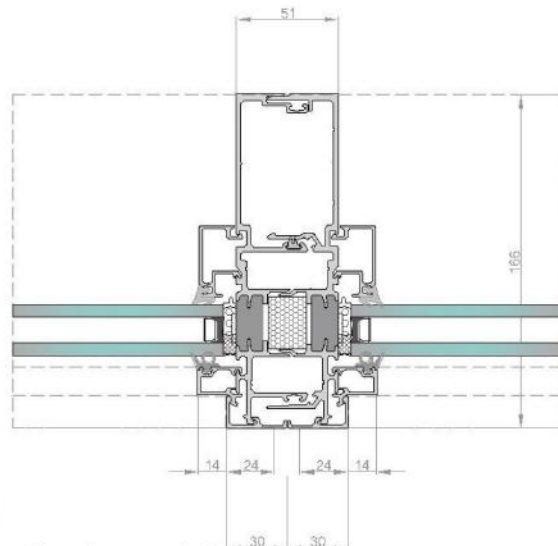


Sill Detail with Starter Track & Sill Flashing

- a. Extruded EPDM and Silicone gaskets
- b. Rain Screen Principle.
- c. Extruded Started sill track to guarantee continuity seal in all panels.
- d. Continuous Silicone sealants applied to the face and under the track.
- e. Extruded sill flashing if required.



Split Mullion Detail Reveal Cap



Split Mullion Detail Flush Caps

R-VALUE & U-VALUE

The assembly U-values and R-values of the two additional scenarios are listed below. The vision area was included in the model to account for any additional heat flow at the connection between the vision and spandrel areas. The center of glass (COG) U-value for the vision section (IGU and frame) is also listed in Table for reference.

Note: The U-values of the vision section do NOT include the deflection. Heat flow through the deflection head is accounted for in the spandrel bypass performance.

Thermal Transmittance for Blackline Aluminum 6500 Series Window Wall System:
Original and Modified Upstand Spandrel Section (Scenarios 1 and 2)



MORRISON HERSHFIELD

Scenario		UCOG Btu/h ft ² °F (W/m ² K)	U _{vision} Btu/h ft ² °F (W/m ² K)	Spandrel Nominal R-value h ft ² °F/Btu (m ² K/W)	Spandrel + Slab		Total System (Vision + Spandrel + Slab)	
					U _s Btu/h ft ² °F (W/m ² K)	R _s h ft ² °F/ Btu (m ² K/W)	U _T Btu/h ft ² °F (W/m ² K)	R _T h ft ² °F/ Btu (m ² K/W)
1	ACM Panel	0.252 (1.43)	0.380 (2.16)	R-34.5 (6.07)	0.231 (1.31)	R-4.3 (0.76)	0.320 (1.82)	R-3.1 (0.55)
2	Glazed IGU				0.226 (1.28)	R-4.4 (0.78)	0.318 (1.81)	R-3.1 (0.55)
1a	ACM Panel (Modified)	0.214 (1.22)	0.347 (1.97)	R-42.0 (RSI-7.39)	0.201 (1.14)	R-5.0 (RSI-0.87)	0.289 (1.64)	R-3.5 (RSI-0.61)
2b	Glazed IGU (Modified)				0.199 (1.13)	R-5.0 (RSI-0.88)	0.288 (1.64)	R-3.5 (RSI-0.61)

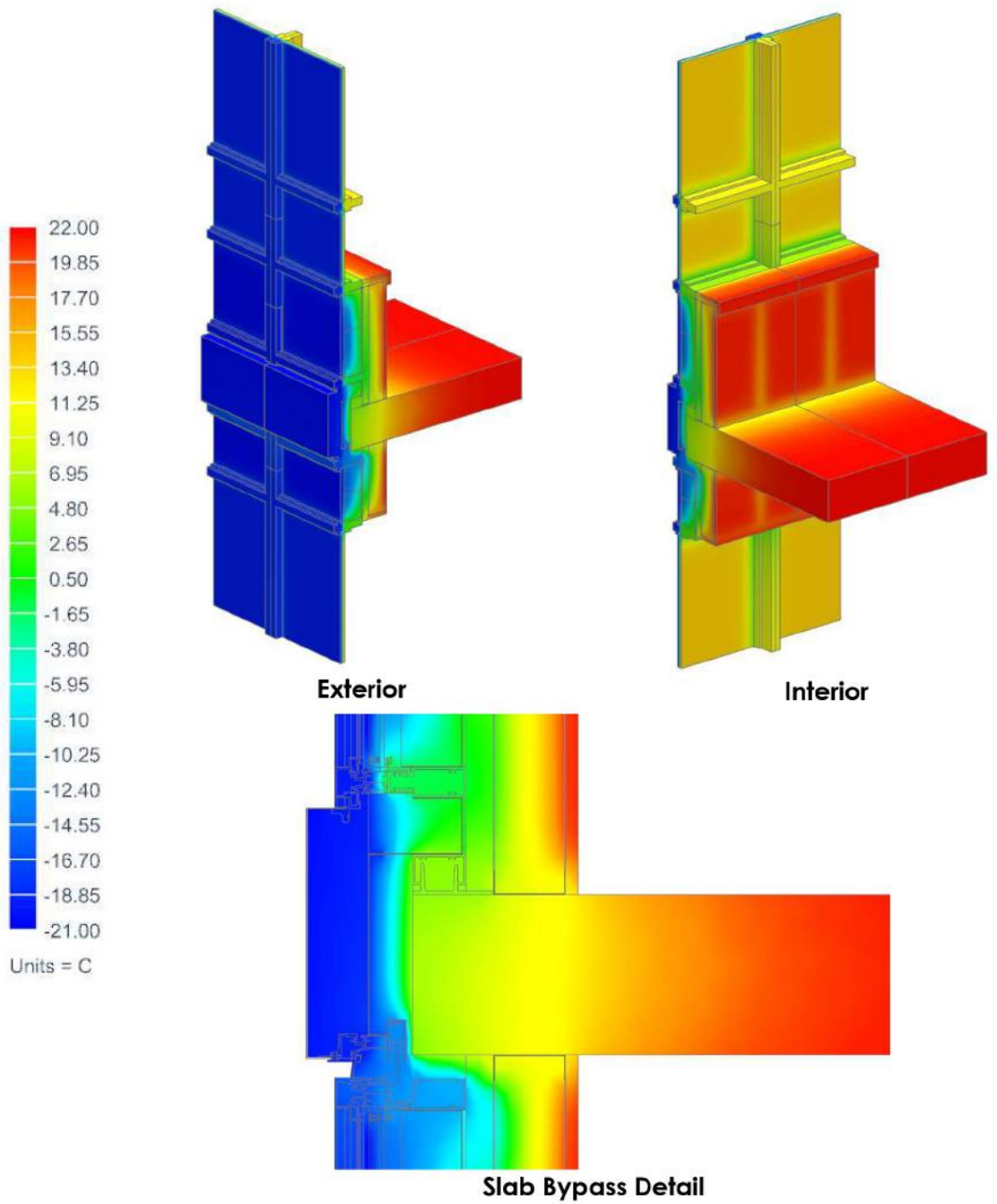
Laboratory Tests Performance

TEST	REQUIREMENTS	RESULTS
(2.1) Vent Operation	Open and close the vent unit ten (10) times.	Not Applicable
(2.2) Pre-load 50% of design pressure <i>ASTM E330-14</i>	Pre-load Pressure: $\pm 1,269$ Pa (± 26.50 psf)	Not Applicable
(2.3) Air inf./exf. test <i>ASTM E283-04 Reapproved 2012</i>	Test pressure: 300 Pa (6.24 psf) Fixed allowable: 0.30 L/s.m ² (0.06 cfm/ft ²) Vent allowable: 0.50 L/s.m ² (0.10 cfm/ft ²)	PASSED
(2.4) Water penetration test (static) <i>ASTM E331-00 Reapproved 2016</i>	Test pressure: 547 Pa (12.0 psf)	PASSED
(2.5) Structural performance test at 100% design pressure (DP) <i>ASTM E330-14</i>	- 50% DP: +1,269 Pa (+26.50 psf) - 100% DP: +2,538 Pa (+53.0 psf) - 50% DP: -1,269 Pa (-26.50 psf) - 100% DP: -2,538 Pa (-53.0 psf)	PASSED
(2.6) Air inf./exf. test <i>ASTM E283-04 Reapproved 2012</i>	Test pressure: 300 Pa (6.24 psf) Fixed allowable: 0.30 L/s.m ² (0.06 cfm/ft ²) Vent allowable: 0.50 L/s.m ² (0.10 cfm/ft ²)	PASSED
(2.7) Water penetration test (static) <i>ASTM E331-00 Reapproved 2016</i>	Test pressure: 547 Pa (12.0 psf)	PASSED

TEST	REQUIREMENTS	RESULTS
(2.8) Interstory vertical up and down movement (3 cycles) <i>AAMA 501.7-09</i>	- 9.5 mm (0.375") upward - Back to initial position - 9.5 mm (0.375") downward - Back to initial position	PASSED
(2.9) Air inf./exf. test <i>ASTM E283-04 Reapproved 2012</i>	Test pressure: 300 Pa (6.24 psf) Fixed allowable: 0.30 L/s.m ² (0.06 cfm/ft ²) Vent allowable: 0.50 L/s.m ² (0.10 cfm/ft ²)	PASSED
(2.10) Water penetration test (static) <i>ASTM E331-00 Reapproved 2016</i>	Test pressure: 547 Pa (12.0 psf)	PASSED
(2.11) Water penetration test (static) <i>ASTM E331-00 Reapproved 2016</i>	Test pressure: 720 Pa (15.0 psf)	PASSED
(2.12) Structural performance test at 150% design pressure (DP) <i>ASTM E330-14</i>	- 75% DP: +1,906 Pa (+39.80 psf) - 150% DP: +3,806 Pa (+79.50 psf) - 75% DP: -1,906 Pa (-39.80 psf) - 150% DP: -3,806 Pa (-79.50 psf)	PASSED

6500 SERIES TEST REPORT

The following figure illustrate the temperature distribution for the Blackline Aluminum 6500 Series Window Wall System.





CLADDING SYSTEM

CHAPTER 3

FACILITIES

Processing | Glass | Panel | Assembly



Over 100,000 sq ft of state-of-the-art manufacturing space

PRODUCTION

Processing

Blackline Aluminum utilizes the latest technology to get information from the drawings to the final product. Our production line uses state-of-the-art automated machining, processing centers, and error-free ERP systems. Barcode scanning allows us to control and analyze every step of production from zero to completion. We use real-time inventory visibility and high-tech machinery to ensure our customer's satisfaction with our product and time management.

Panel

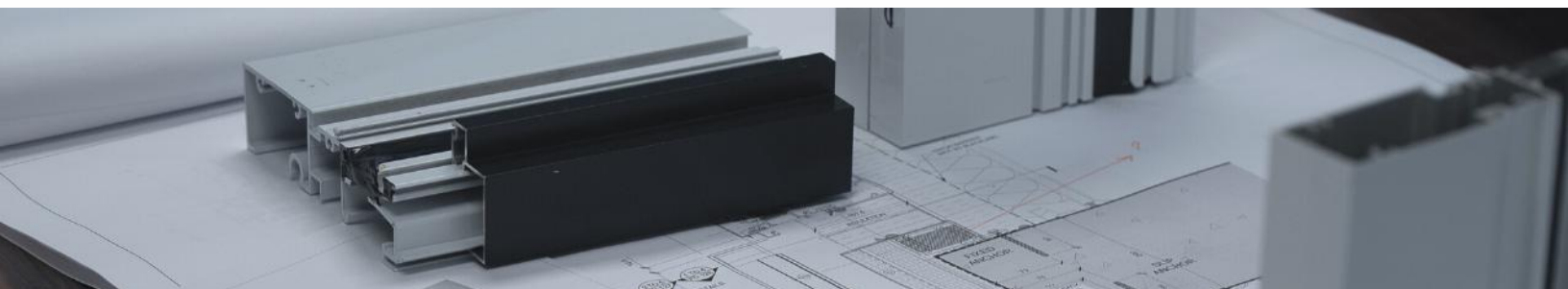
Our fully equipped panel line is designed to provide the best possible products. And our in-house design/engineering team works with the latest software to bring any design or product to reality with our precise laser cutter, meticulous vertical CNC router, and remarkable 200-ton CNC bender, working with the highest quality materials and QC process we ensure that our products meet the test of time.

Glass

Blackline Aluminum has the most advanced glass equipment, including a computerized storage system. Jumbo Cutting Tables, Tempering Machine, Roll Coating, etc. All give us complete control of every stage of glass production, from glass quality and waste management to the highest production output, enabling us to run the whole operation smoothly and efficiently.

Assembly

The heart of any manufacturing plant lies with the Assembly line, our experienced and trained operators work with the most vigorous QC protocols and testing procedures to ensure our standards and quality is maintained.



MACHINERY & EQUIPMENT



Panel: Bystronic - Laser Cutting

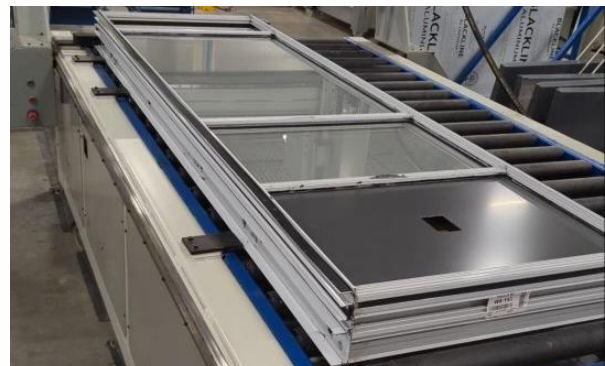


Processing: Elumatec - CNC



Glass: Movetro - Robotic Glass Storage

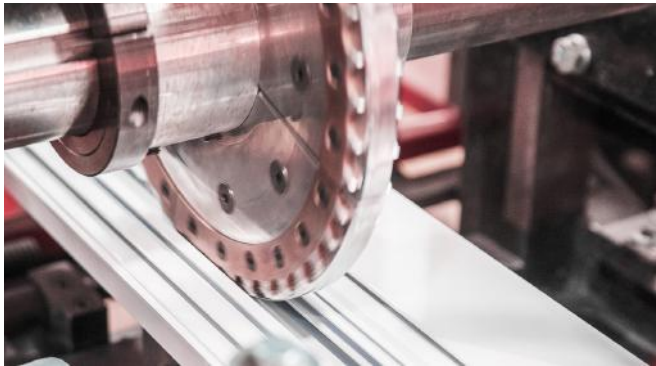
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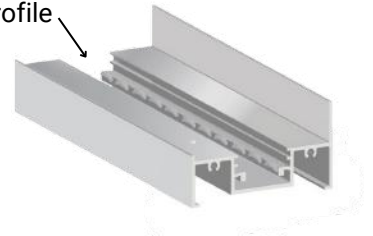
Assembly:
Automated Silicone Dispensing

PROCESSING

All new polyurethane pour and de-bridge structural thermal break 3 steps of Azon:
Lancing, Pouring, De-Bridge



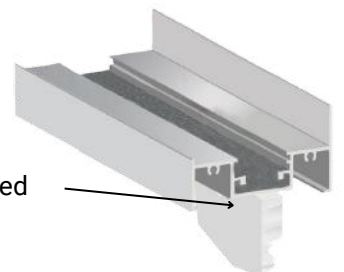
MLP™
Mechanical Lock Profile



Pour
Tornado III Dynamic Mixer



Debridge
Metal Bridge Removed



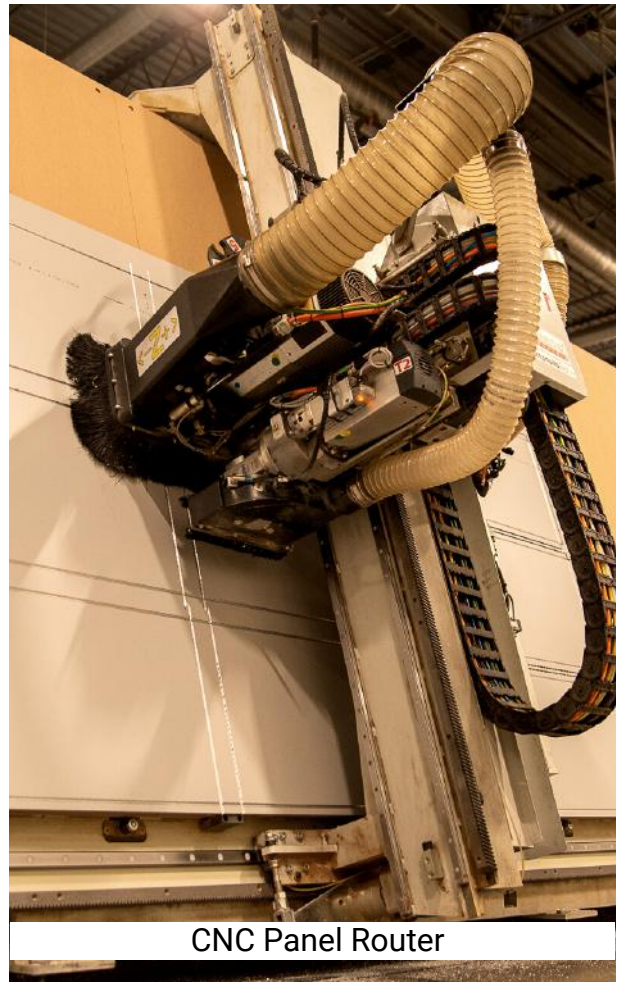
PANEL

Fully equipped panel line is designed to provide the best possible products.

ALU Ranger is a CNC panel router with vertical table and it has been designed and equipped to process composite aluminum panels. →



Bystronic Laser Cutting



CNC Panel Router

Fiber laser metal sheet cutting machines
The result is a product with every innovation available, and a solution that can outperform and outlast any competing system available in the industry.



GLASS

Advanced glass equipment, including computerized storage

- Automated Storage System
- Robotic Loading
- Jumbo Cutting Tables
- Seaming and Washing
- Heat Strength and Tempering
- In House Bird-Friendly and Spandrel Glass
- IGU Production Line



Movetro - Robotic Loading



BIRD FRIENDLY GLASS



HEAT SOAKED GLASS



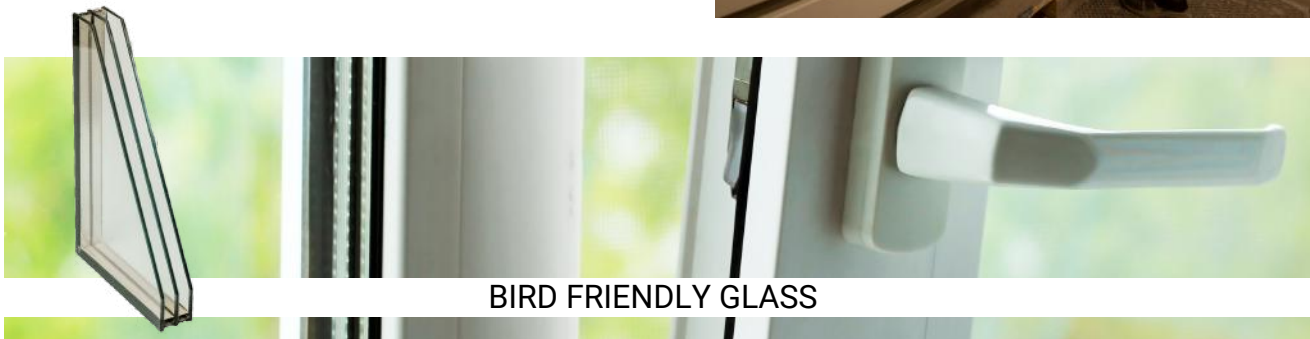
TEMPERED GLASS



SPANDREL GLASS

ALUMINUM WINDOW INDUSTRY

- BIRD FRIENDLY GLASS
- HEAT SOAKED GLASS
- TEMPERED GLASS
- SPANDREL GLASS
- DOUBLE / TRIPLE GLAZE



BIRD FRIENDLY GLASS

ASSEMBLY

The design for our assembly line is determined by analyzing the steps necessary to manufacture each product component as well as the final product.



Assembly Line



**WE WORK WITH LEADING HIGH-RISE BUILDERS,
DEVELOPERS AND ARCHITECTS**



CHAPTER 4

PROJECTS

OUR CURRENT, COMPLETED/FUTURE PROJECTS



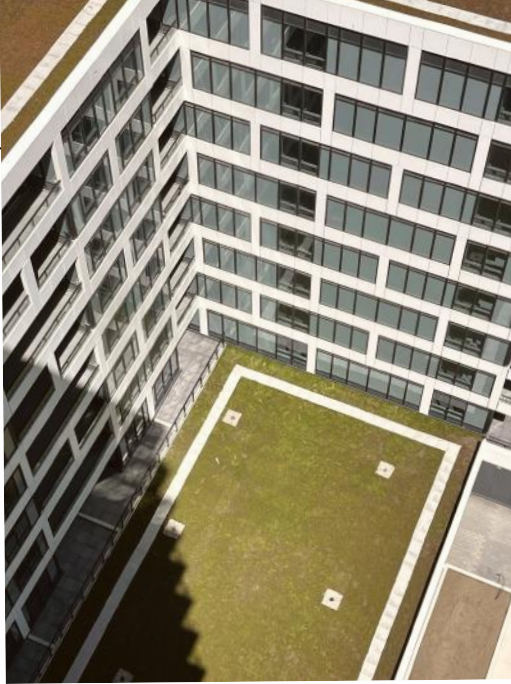
RIVERVIEW TOWERS



PAVILIA TOWERS



**SIXTY FIVE BROADWAY
TOWERS**



Riverview Towers

Location: Hwy 7 & Verclaire Gate South, Markham, Ontario

Architect: Kirkor Architects + Planners

Units: 1,042

Status: Under Construction

Type: High-Rise Residential

Completion Date: Building C - 2022

Building A and B - 2024*



Pavilia Towers

Location: Hwy 7 & South Park Road, Thornhill, Ontario

Architect: Icke Brochu Architects Inc.

Units: 769

Status: Under Construction

Type: High-Rise Residential

Completion Date: Building A - 2022

Building B - 2023*



Future Project:

65 Broadway Condos

Location: 65 Broadway Avenue, Toronto, Ontario

Architect: Wallman Architects

Units: 778

Status: Under Construction

Type: High-Rise Residential

Completion Date: 2025*



Future Project

5800 Yonge Street

Location: 5800 Yonge Street, North York, Ontario

Category: Residential Condominium

Status: Pre-Construction

Units: 2000

Storeys: 46, 48 (Residential) 52,54 (Rental)



Future Project

The Dylan

Location: 831 Glencairn Avenue, Toronto, Ontario

Category: Residential

Status: Pre-Construction

Units: 218, 5, 4

Number of Buildings 1

Storeys: 10



Future Project

4569 Kingston Road

Location: 4569 Kingston Road, Toronto, Ontario

Category: Residential

Status: Pre-Construction

Number of Buildings: 1




Storeys: 11



Blackline Head Office:
110 Cochrane Drive, Unit A, Markham, ON L3R 9S1

Manufacturing Plant:
400 Cochrane Drive, Unit 3, Markham, ON L3R 8E3

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@blacklinealuminum   

You are invited to have a tour of Blackline Aluminum, contact us!