

PRODUCT **ForceFront Blast Series Curtainwall**
 2-1/2" x 7 3/4" (captured and structurally glazed)

TEST RESULTS

Air Infiltration	ASTM E283	0.06 cfm/ft² @ 6.24 psf
Static Pressure Water Resistance	ASTM E331	15 psf
Dynamic Pressure Water Resistance	AAMA 501.1	15 psf
Structural – Design Load	ASTM E330	40 psf
Interstory Vertical Displacement	AAMA 501.7	+/- 0.5"
Interstory Horizontal Displacement	AAMA 501.4	+/- 1.44"
Thermal Cycling	AAMA 501.5	0 °F to 180 °F
Structural – Overload	ASTM E330	60 psf
Seismic Movement	AAMA 501.4	+/- 2.16"

TEST LAB

QCT

Mosinee, WI 54455

Intertek

West Palm Beach, FL 33407

Report Number	QCT16-4126.01	H3767.02-450-32-R1
Test Date	5/22/2017 – 6/22/2017	2/7/2018 – 2/28/2018
Report Date	6/22/2017	4/16/18

Reference reports in above table for complete test specimen description and data. Contact a Tubelite representative for more information.

Tubelite Representative:

 (sign) 9/24/2019 (date)
Tim Fookes - Vice President of Engineering (title)

TEST METHODS

Air Infiltration: 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*. Testing was conducted at 6.24 psf positive static air pressure difference.

Static Pressure Water Resistance: ASTM E331-00 (2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, Curtain Walls by Uniform Static Air Pressure Difference*. Testing was conducted at 15 psf positive static air pressure difference for 15 minute duration. Water applied at a minimum rate of 5 gal/ft²/hr.

Dynamic Pressure Water Resistance: AAMA 501.1-05, *Standard Test Method for Water Penetration of Windows, Curtain Walls, and Doors Using Dynamic Pressure*. Testing was conducted with a dynamic pressure equivalent of 15 psf for a 15 minute duration. Water applied at a minimum rate of 5 gal/ft²/hr.

Structural Performance: ASTM E330/E330M-14, *Standard Test Method for Structural Performance of Exterior Windows, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*. Testing was conducted at +/- 40 psf design loads and +/- 60 psf overloads. Allowable Criteria: Design - L/175 deflection normal to wall plane for clear spans up to 13'-6". Overload – net permanent set shall not exceed 0.2% of the clear span.

Interstory Vertical Movement: AAMA 501.7-11. *Recommended Static Test Method for Evaluating Windows, Window Wall, Curtain Wall and Storefront Systems Subjected to Vertical Inter-story Movements*. Testing conducted with three complete cycles in the vertical direction parallel to the main elevation at the intermediate simulation. Parallel movement will be 1/2" up, back to zero, 1/2" down and back to zero (one cycle). There shall be no glass breakage, permanent damage to frame members, or anchors.

Interstory Horizontal Displacement: AAMA 501.4-09, *Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts*. Testing was conducted with three complete cycles in the horizontal direction at floor simulation. Horizontal movement is up to 1.44" to the left, then back to zero, 1.44" to the right then back to zero. Allowable criteria: There shall be no failure or gross permanent distortion of anchors, frame, glass, or panels. Structural silicone shall not experience adhesive or cohesive failure along any glass, frame, or panel edge. Glazing gaskets may not disengage and weather seals may not fail.

Thermal Cycling: AAMA 501.5-07, *Standard Test Method for Thermal Cycling of Exterior Walls*. Testing was conducted with three thermal cycles. Each cycle maintained for two hours after establishing the following temperatures and consist of:

- a. Low exterior temperature of 0 °F.
- b. High exterior temperature of 180 °F.
- c. Interior temperature maintained between 70 °F and 80 °F.
- d. System components shall withstand thermal movements without buckling, distortion, cracking, failure or glass, and failure of joint seals or undue stress on the finished surfaces, materials, or fixing assemblies.

Seismic Movement: AAMA 501.4-09. *Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Inducted Interstory Drifts.* Testing conducted with three complete cycles in the horizontal direction parallel to the plane of the wall. Parallel horizontal movement will be up to 2.16" left, back to zero, 2.16" right and back to zero (one cycle). Allowable criteria: There shall be no glass breakage, permanent damage to frame members, or anchors.