



Blast Resistant Windows



Avalon International
Aluminum, Inc.

1-800-678-0566

info@avalonint.com

www.avalonint.com

BLAST RESISTANT WINDOWS



Aluminum Blast Resistant Windows

These Blast Resistant Windows can resist a blast wave from an explosion or from extreme weather events. These windows are generally fixed external building windows or observation windows for testing environments and specialty rooms to meet life and safety demands.

The blast-resistant window's style, color, and size can be selected or customized to most any preference. It is designed according to the actual size of the building's rough openings to meet the needs of the customer and maximize performance.

Function of Blast Resistant Windows

The frame finish has great UV resistance to maintain an appealing modern architectural look for many years, and specialty glass can be selected for additional protection against EM interference to protect sensitive electronic devices. Adding windows allows the building to meet natural lighting requirements, reducing costs and promoting occupant satisfaction and wellbeing. Specifying and installing windows resistant to shock waves generated by an explosion or sudden depressurization from an external event can help prevent significant damage or injury to people and property caused by flying debris and ruptured glass, especially when compared to standard exterior windows.

Application Scope of Blast Resistant Windows

These windows are suitable for military, chemical, petroleum, fine powder, and explosive material handling warehouses, gas rooms, control rooms, laboratories, boiler rooms, and other buildings and viewing walls with safety protection requirements against sudden pressure differences.



BLAST TESTING



The testing method for the blast resistant windows involved standing the window unit 2m away from the center of a 500g TNT cylindrical explosive (size: 80mmx61mm). After detonating with an electric No. 8 detonator, the overall structure of the aluminum alloy blast resistant window was intact, the sash was broken, the laminated glass was intact, and there was no splash on the back of the glass.



Image 1: Aluminum alloy blast-resistant window and TNT bare charge cylinder before explosion test



Image 2: Aluminum alloy blast-resistant window after explosion test

Technical Specifications

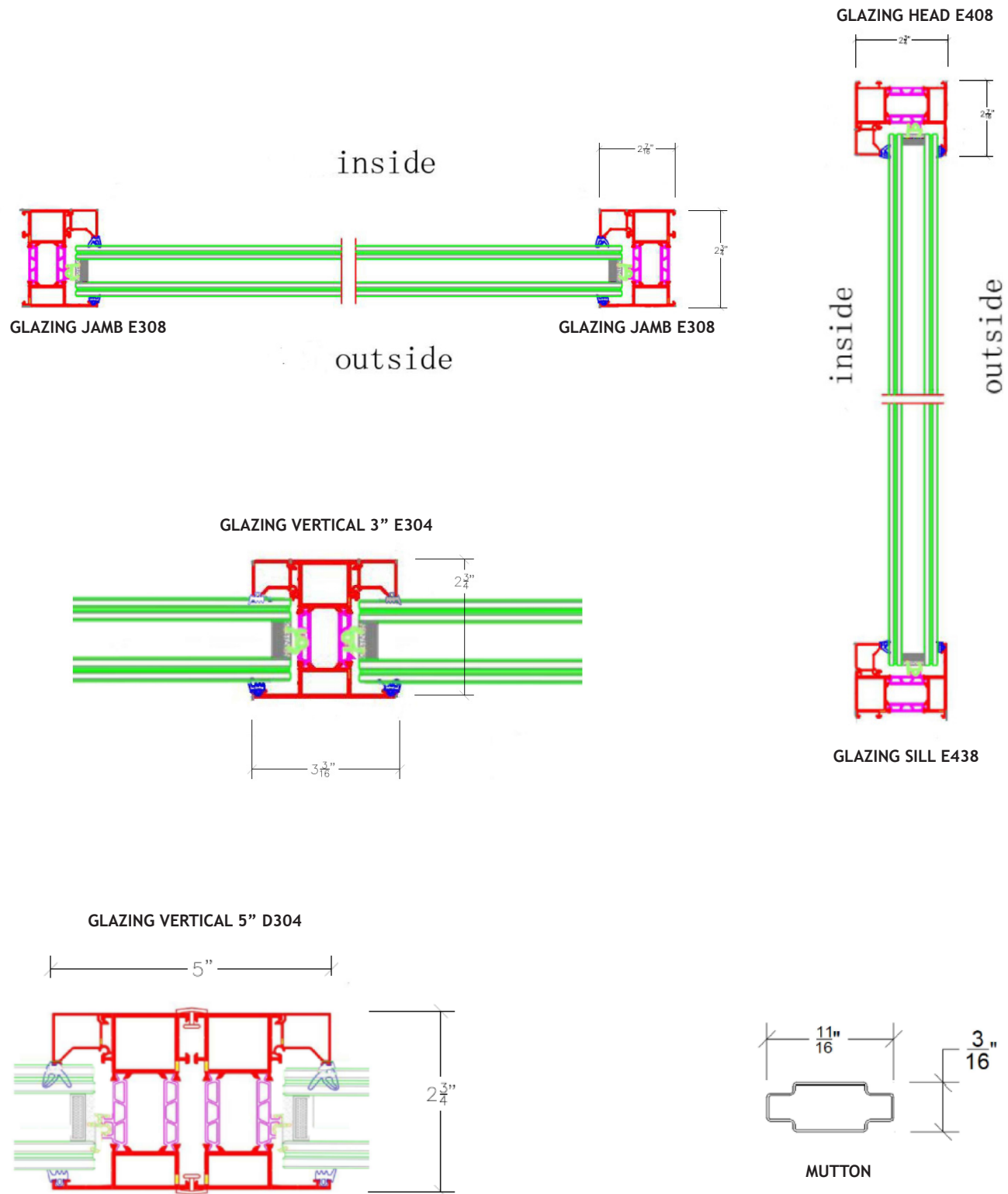
Material	Aluminum alloy extrusion
Material Thickness	2.0 mm
Blast Resistant Glass Thickness	8mm (glass) + 0.76mm (lamine) + 8mm (glass)
Impulse Pressure Resistance	1424 Pa

Material	Aluminum alloy extrusion
Material Thickness	2.5 mm
Blast Resistant Glass Thickness	12mm (glass) + 0.76mm (lamine) + 12mm (glass)
Impulse Pressure Resistance	1424 Pa

SECTION VIEWS



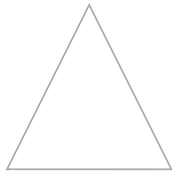
PROPRIETARY BLAST MATERIALS NOT SHOWN*



POWDER COATINGS



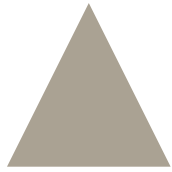
Standard
Black



Standard
White



Standard
Bronze



Champagne
Bronze

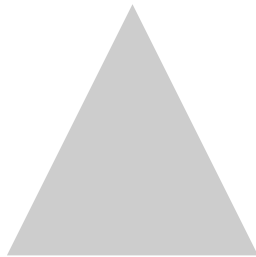


Standard
Gray



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&
Color Combos

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**NOTE: Colors shown on this
page are ink representations only.**

Materials and Finishes

In adopting powder coat finishing, AVALON / Dual Lock was one of the early pioneers in converting to a finishing system that would prove to be far superior to the liquid paints typically used in the aluminum door frame industry and much more consistent than color anodized finishes.

All AVALON frames manufactured in our facility are finished with the highest quality powder coatings available. Typically, an epoxy-polyester hybrid is used, which blends the extreme durability of epoxy finishes with the resiliency of a polyester coating, creating the best of both worlds.

Unlimited Color Choices

With color choice, AVALON can offer a much wider range of colors than just those shown here. In fact, the choice of custom colors is virtually unlimited, ranging from soft pastels and exotics to veined metallics.

Why Specify Powder Coatings?

Compared to liquid solvent borne coatings (enamels, lacquers, acrylics, etc.), powder coatings offer vastly superior quality of adhesion. This means that not only will powders offer higher chemical resistance, particularly important in post-construction clean-up, they also have a much higher level of impact resistance.

Powder coatings maintain good color and gloss in heavy use or high traffic areas. The industry standard to anodized colors allows for as much as 20% variation in color on a single component, whereas powder coats are perfectly consistent.

From an architectural standpoint, powder coatings offer superior edge adhesion when compared to liquid paint. This is the ability to apply the coating to sharp edges, a particularly important aspect in finishing aluminum extrusions, preventing coating failure at corners as seen with liquid finishes. Furthermore, powders have excellent abrasion and chip resistance due to their higher molecular resin weight, yet unlike color anodized, powders can be touched-up.

The finishing process deposits dry powder on the aluminum surface; electrostatic charges make the powder stick to the surface in an even, uniform manner. Then the particles are immediately melted and fused into a smooth coating as the metal passes through an 80-foot baking oven. This process eliminates the sags and runs found in liquids, as well as the inclusion of dust and foreign particles that liquid paints often attract during flash off and curing.

The nicks, scratches, and production contaminations, normally seen in frames with a liquid finish will simply not be found in our powder coating. Additionally, powder will offer a smoother, more attractive finish that can be achieved in a wide range of gloss levels. Coverage is always consistent as the application process ensures a uniform coating density, texture, surface roll, and thickness across all surfaces.

Concerning environmental sustainability, powder paint products are earth based and materially inert, avoiding harm to the environment, unlike the toxins, chemical releases, and on-site off-gassing that occurs with liquid paint and color anodized applications. AVALON powder coats are 100% environmentally friendly!

No Solvents of VOCs - No Dangerous Substances - No Toxic Compounds



Aluminum Blast Resistant Windows

Section 085123 & 085653

Part 1 - General

1.01 SECTION INCLUDES

- A** Extruded assembled aluminum frames and glazing. Coordinate with Sections 085000.

1.02 REFERENCES

- A** American Society for Testing Materials (ASTM): 1. B 221: "Specifications for Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes."
- B** Architectural Aluminum Manufacturers Association (AAMA): AAMA 603: Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum.

1.03 SUBMITTALS

- A** Procedures: In accordance with General Conditions.
- B** Shop Drawings: Indicate frame thickness and configuration, location of cutouts for hardware, reinforcement and finish. Show profiles, types, dimensions, anchorage construction, relationships to adjacent structure and interface with adjacent materials. Cross reference to Schedules.
- C** Sample for Verification of Painted Finishes: Submit two samples on 3 by 5 inch standard "Q" panel.
- D** Product data including illustrated isometric installation instructions.

1.04 SEQUENCING AND SCHEDULING

- A** Do not begin fabrication of frames until hardware templates have been received from hardware supplier.

1.05 QUALITY ASSURANCE

- A** Installer Qualifications. Capable of installing and authorized by manufacturer to install all products specified in this Section.

1.06 DELIVERY, STORAGE, AND HANDLING

- A** Deliver, store, and handle frames in a manner to prevent damage or deterioration.
- B** Provide packaging such as cardboard or other containers, separators, banding, spreaders, and paper wrappings to protect items.
- C** Follow special storage and handling requirements of manufacturer.

Part 2 - Products

2.01 ACCEPTABLE MANUFACTURER

- A** AVALON Eagle Blast Series, as manufactured by AVALON INTERNATIONAL ALUMINUM, LLC. Portland, Oregon, 1-800-678-0566, is specified as design standard.
- B** Glazing Frames: Snap-in type stops with manufacturer's

standard neoprene® gaskets. Glass adjacent to metal without intervening gasket not permitted.

- C** Substitutions: Acceptable substitution subject to provisions of Sections 2.01 (A) and (D) must be approved ten days prior to bid date.

- D** Other Substitutions: None permitted.

- E** Finish: Thermal-setting powder coating.

- Type: Hybrid Epoxy-Polyester blend. Minimum film thickness of 1.8 mils required.
- Application: Finish must be factory applied to ensure controlled film thickness and smooth surface.
- Color: Standard or Custom color as selected by Architect.

2.02 FRAMES

- A** Aluminum alloy, extruded and fabricated to shapes as required for each application, for field installation.
- B** Thickness of Main Frame Members: 0.062 inch nominal. Increase to 0.130 inch at anchorage.
- C** Fasteners and Hardware: Aluminum, stainless steel, or other non-corrosive materials compatible with aluminum and acceptable to frame manufacturer, countersunk style. Exposed fasteners not permitted.

Part 3 - Execution

3.01 INSTALLATION

- A** Install frames in accordance with manufacturer's instructions. Rough opening to be framed out using steel studs, not steel track.
- B** Coordinate with wall construction for anchor placement.
- C** Install plumb and true in line, with all necessary clips, anchors, and fastenings. Direct attachment of frame to metal stud required.
- D** Coordinate installation of glass and glazing to comply with Section 09900 "Glazing" for glazed openings.
- E** Install reinforcement channels between two abutting frames. Anchor to structure and floor.
- F** Accurately join, fit, and reinforce corners to flush hairline joints.

3.02 TOLERANCES

- A** Install frames to permit hanging wood doors to AWI requirements as specified in Section 08211.

3.03 ADJUSTING AND CLEANING

- A** Adjust hardware for smooth and balanced door movement.
- B** Clean completed system promptly after erection taking care to avoid damage to finishes.