

SECTION 08 41 13: ALUMINUM FRAMED ENTRANCES AND STOREFRONTS

This specification has been developed using the current edition of the Construction Specification Institute (CSI) “Manual of Practice”, including the recommendations for the CSI three-part Section Format and the CSI Page Format. Additionally, the development concept and organizational arrangement of the American Institute of Architects (AIA) MasterSpec® Program has been followed in the preparation of this specification.

EDITOR NOTE: Instructions to the editor appear in RED and should be removed prior to incorporation into project specifications.

PART 1 GENERAL

1.1 SUMMARY

- A. This Section covers Facades USA 1500T Storefront System including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.

1.2 RELATED SECTIONS

- A. 072700: Air Barriers
- B. 079200: Joint Sealants
- C. 083213: Sliding Aluminum-Framed Glass Doors
- D. 084313: Aluminum-Framed Storefronts
- E. 084329: Sliding Storefronts
- F. 084413: Glazed Aluminum Curtain Walls
- G. 084433: Sloped Glazing Assemblies
- H. 085113: Aluminum Windows
- I. 086300: Metal-Framed Skylights
- J. 088000: Glazing
- K. 107113: Exterior Sun Control Devices
- L. 122600: Interior Daylighting Devices

1.3 DEFINITIONS

- A. For fenestration industry standard terminology and definitions, refer to the Fenestration & Glazing Industry Alliance (FGIA) Glossary (AAMA AG-13).

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance
 - 1. Product to comply with the specified performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction, as determined by testing of glazed aluminum storefront representing those indicated for this project.
 - 2. Aluminum storefront systems shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 3. Failure includes any of these events:
 - a. Thermal stresses transferring to building structure
 - b. Glass breakage
 - c. Loosening or weakening of fasteners, attachments, and other components
 - d. Failure of operating units
- B. Delegated Design
 - 1. Design aluminum storefront systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

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C. Wind Loads

1. The storefront system shall include anchorage that is capable of withstanding the following wind load design pressures:
EDITOR NOTE: Provide wind load design pressure in PSF and include applicable Building Code and Year Edition.
2. Inward: [] psf
3. Outward: [] psf
4. The design pressures are based on the [] Building Code, [] Edition.

D. Air Leakage

1. The test specimen shall be tested in accordance with ASTM E 283.
2. With interior seal, air infiltration rate shall not exceed 0.06 cfm/ft² (0.3 l/s · m²) at a static air pressure differential of 6.2 psf (300 Pa).
3. Without interior seal, air infiltration rate shall not exceed 0.06 cfm/ft² (0.3 l/s · m²) at a static air pressure differential of 1.6 psf (75 Pa).
4. CSA A440 Fixed Rating

E. Water Resistance

1. The test specimen shall be tested in accordance with ASTM E 331.
2. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501.

F. Uniform Load

1. A static air design load of 35 psf (1680 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330.
2. There shall be no deflection in excess of L/175 of the span of any framing member at design load.
3. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

G. Seismic

1. When tested to AAMA 501.4, system must meet design displacement (elastic) of 0.010 times the story height and ultimate displacement (inelastic) of 1.5 times the design displacement.

H. Thermal Movements

- 1.

I. Thermal Transmittance (U-Factor)

1. Thermal transmittance test results are based upon 1" (25.4 mm) clear high-performance insulating glass [1/4" (e=0.035, #2), 1/2" warm edge spacer and argon fill gas, 1/4"].
2. When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:
 - a. Glass to exterior .47 (low-e) or 0.61 (clear) or project specific [] Btu/hr/ft²/°F per AAMA 507 or [] Btu/hr/ft²/°F per NFRC 100.
 - b. Glass to center .44 (low-e) or 0.61 (clear) or project specific [] Btu/hr/ft²/°F per AAMA 507 or [] Btu/hr/ft²/°F per NFRC 100.
 - c. Glass to interior .41 (low-e) or 0.56 (clear) or project specific [] Btu/hr/ft²/°F per AAMA 507 or [] Btu/hr/ft²/°F per NFRC 100.

J. Condensation Resistance Factor (CRF) or Temperature Index (TI)

1. The glass to exterior CRF, when tested to AAMA Specification 1503, shall not be less than 70_{frame} and 69_{glass} (low-e) or 69_{frame} and 58_{glass} (clear)

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2. The glass to center CRF, when tested to AAMA Specification 1503, shall not be less than 62_{frame} and 68_{glass} (low-e) or 63_{frame} and 56_{glass} (clear)
3. The glass to interior CRF, when tested to AAMA Specification 1503, shall not be less than 56_{frame} and 67_{glass} (low-e) or 54_{frame} and 58_{glass} (clear)

K. Sound Transmission Class (STC) or Outdoor-Indoor Transmission Class (OITC)

1. Sound transmission loss test results in accordance with AAMA 1801 are based upon 1" (25.4 mm) clear double laminated insulating glass with PVB interlayer (1/8", 0.030", 1/8", 1/2" AS, 1/8", 0.030", 1/8").
2. The glass to exterior ratings, when tested to ASTM E1425 and ASTM E90, shall not be less than STC 38 and OITC 31.
3. The glass to center ratings, when tested to ASTM E1425 and ASTM E90, shall not be less than STC 37 and OITC 30.
4. The glass to interior ratings, when tested to ASTM E1425 and ASTM E90, shall not be less than STC 38 and OITC 30.

1.5 SUBMITTALS

A. Product Data

1. For each type of product indicated, include:
 - a. Construction details
 - b. Material descriptions
 - c. Dimensions of individual components and profiles
 - d. Finishes
2. Recycled Content
 - a. Provide documentation that aluminum has a minimum of 50% mixed pre- and post-consumer recycled content.
 - b. Provide a sample document illustrating project-specific information that will be provided after product shipment.
 - c. After product has shipped, provide project-specific recycled content information:
 1. Indicate recycled content, including the percentage of pre- and post-consumer recycled content per unit of product.
 2. Indicate the relative dollar value of recycled content product to the total dollar value of product included in the project.
 3. Indicate the location for recovery of recycled content.
 4. Indicate the location of the manufacturing facility.

B. Shop Drawings

1. Plans
2. Elevations
3. Sections
4. Full-size details
5. Attachments to other work

C. Samples

1. Samples for Initial Selection:
 - a. Provide samples for units with factory-applied color finishes.
2. Samples for Verification:
 - a. Provide a verification sample for each type of exposed finish required, in manufacturer's standard sizes.

D. Product Test Reports

1. Provide test reports for storefront systems.

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2. Test reports must be based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency.
3. Test reports must indicate compliance with performance requirements.

E. Fabrication Sample:

1. Provide a fabrication sample of each vertical-to-horizontal intersection of aluminum-framed storefront systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
 - a. Joinery
 - b. Glazing

1.6 QUALITY ASSURANCE

A. Installer Qualifications

1. Installer must have successfully installed the same or similar systems required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications

1. Manufacturer must be capable of fabricating glazed aluminum storefront that meet or exceed the stated performance requirements.

C. Source Limitations

1. Obtain aluminum storefront system through one source from a single manufacturer.

D. Product Options

1. Information on drawings and in specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
2. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups

1. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
2. Build mockups for the type(s) of storefront elevation(s) indicated, in location(s) shown on drawings.

F. Pre-Installation Conference

1. Conduct conference at project site to comply with requirements in Division 01 Project Management and Coordination Section.

1.7 PROJECT CONDITIONS

A. Field Measurements

1. Verify actual locations of structural supports for glazed aluminum storefront by field measurements before installation.

1.8 WARRANTY

A. Submit manufacturer's standard warranty for owner's acceptance.

B. Warranty Period:

1. Two years from Date of Substantial Completion of the project provided however that in no event shall the Limited Warranty begin later than six months from date of shipment by manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

Facades USA

930 Cass St, New Castle, PA, 16101

412-820-2200

www.FacadesUSA.com

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Facades USA reserves the right to change configuration without prior notice when deemed necessary for product improvement.

Laws and building and safety codes governing the design and use of Facades USA products vary widely. Facades USA does not control the selection of product configurations, materials, or hardware and assumes no responsibility therefore.

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A. Basis of Design Product

1. Facades USA 1500T Storefront System
 - a. 2" x 4-1/2" Framing
 - b. Thermally Broken Design

B. Substitutions

1. The drawing and specifications have been designed to conform to Facades USA. Substitutions must be made 2 weeks in advance of the project bid date and must be requested in accordance with the substitution request format detail in the general conditions of the specification for substitutions to be considered. Without prior approval to the project bid date and an addendum issued to all bidders a substitution is not permitted.
2. To be considered for substitution prior to bid the product must comply with substitution request procedures and demonstrate the product meets the performance requirements listed in 1.4 Performance Requirements of this specification; in conjunction with the request the following must be submitted: Calculations that certify the product does meet the performance requirements in ASCE/SEI 7 and a full size sample for review.

2.2 MATERIALS

A. Extrusions

1. Alloy and temper recommended by glazed aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish
2. Not less than 0.070" (1.8 mm) wall thickness at any location for the main frame

B. Fasteners

1. Aluminum, nonmagnetic stainless steel or other materials must be non-corrosive and compatible with aluminum members, trim hardware, anchors, and other components.

C. Anchors, Clips, and Accessories

1. Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating.
2. Anchors, clips, and accessories shall provide sufficient strength to withstand the design pressure indicated.
3. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

D. Pressure Plate:

1. Pressure plate shall be aluminum.
2. Pressure plate shall be fastened to the mullion with stainless steel screws.

E. Reinforcing Members

1. Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating.
2. Reinforcing members must provide sufficient strength to withstand the design pressure indicated.

F. Sealant

1. For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

G. Thermal Barrier:

1. Thermal separator shall be extruded of a silicone compatible elastomer that provides a minimum 1/4" (6.3 mm) separation.

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H. Glazing Gaskets:

1. Gaskets to meet requirements of ASTM C864.

I. Spacers and Setting Blocks:

1. Manufacturer's standard elastomeric type

J. Component Cladding (Infill):

EDITOR NOTE: Select Component Cladding(s) (Infill) From List Below.

1. Glass

a. Monolithic Glass

1. 1/8" Thick
2. 3/16" Thick
3. 1/4" Thick [EDITOR NOTE: This is the most common monolithic glass thickness]
4. 5/16" Thick
5. 3/8" Thick
6. 7/16" Thick
7. 1/2" Thick
8. 9/16" Thick

b. Insulated Glass Unit (IGU)

1. 7/8" Thick
2. 15/16" Thick
3. 1" Thick [EDITOR NOTE: This is the most common IGU thickness]
4. 1 1/16" Thick
5. 1 1/8" Thick

2. Aluminum Panel

a. Aluminum Plate Panel

1. 1/8" Thick [EDITOR NOTE: This is the most common aluminum plate panel thickness]
2. 3/16" Thick
3. 1/4" Thick

b. Perforated Aluminum Panel

1. 1/8" Thick
2. Perforated aluminum panel infill only to be used in non-weathertight areas.
EDITOR NOTE: Select perforation pattern from below link.
<https://www.facadesusa.com/perforated-sheet.html>
3. Perforation pattern to be [_____].

2.3 FABRICATION

A. Extrude or form aluminum shapes before finishing.

B. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations
2. Accurately fitted joints
3. Physical and thermal isolation of glazing from framing members
4. Accommodations for thermal and mechanical movements of glazing and framing that maintain required glazing edge clearances
5. Provisions for field replacement of glazing from exterior
6. Fasteners, anchors, and connection devices that are concealed from view to the greatest extent possible
7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum storefront to exterior

C. Storefront:

Facades USA

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412-820-2200

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1. Fabricate components for assembly following manufacturer's standard installation instructions.
2. After fabrication, clearly mark components to identify their locations in project according to shop drawings.

2.4 FINISHES

- A. Finishes General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Aluminum Finishes:
 1. High-Performance Organic Finish: Three-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
EDITOR NOTE: Insert Selected Color Below.
 - a. Color and Gloss: To Match Sherwin Williams Fluoropon [_____]
- C. Warranty: Provide written 10 year warranty against loss of film integrity, chalking, fading, non-uniformity, and corrosion.

PART 3 EXECUTION

3.1 EXAMINATION

- A. With installer present, examine areas for compliance with requirements for installation tolerances and other conditions affecting performance of the work.
- B. Proceed with installation only after correcting unsatisfactory conditions.

3.2 INSTALLATION

- A. Storefront System Installation:
 1. Install storefront systems plumb, level, and true to line, without warp or rack of frames, within manufacturer's prescribed tolerances, and complying with installation instructions.
 2. Provide support and anchor in place.
 3. Dissimilar Materials:
 - a. Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
 4. Glazing:
 - a. Glass shall be outside-glazed.
 5. Glass shall be held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners that are spaced no more than 9" (228.6 mm) on center.
 6. Water Drainage
 - a. Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations.
 - b. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.
- B. Related Products Installation:
 1. Sealants (Perimeter):
 - a. Refer to Joint Treatment (Sealants) Section.
 2. Glass:
 - a. Refer to Glass and Glazing Section.
 - b. Reference: ANSI Z97.1, CPSC 16 CFR 1201, and GANA Glazing Manual.

3.3 FIELD QUALITY CONTROL

- A. Field Tests:

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1. Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter-caulked, and cured.
 2. Conduct tests for air infiltration and water penetration with manufacturer's representative present.
 3. Tests that do not meet the specified performance requirements and units that have deficiencies shall be corrected as part of the contract amount.
 4. Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.
 5. Air Infiltration Tests:
 - a. Conduct tests in accordance with ASTM E 783.
 - b. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², whichever is greater.
 6. Water Infiltration Tests:
 - a. Conduct tests in accordance with ASTM E 1105.
 - b. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 6.2 psf (300 Pa).
- B. Manufacturer's Field Services:
1. Upon owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 ADJUSTING, CLEANING AND PROTECTION

A. Adjusting:

1. Not applicable

B. Cleaning:

1. Repair or replace damaged installed products.
2. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.
3. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during the construction period.
4. Remove construction debris from project site and legally dispose of debris.

C. Protection:

1. Protect installed product's finish surfaces from damage during construction.
2. Protect aluminum storefront system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

END OF SECTION 08 41 13