

SECTION 08400
ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum entrances and storefronts.
- B. Hurricane resistant aluminum entrances and storefronts.
- C. Impact resistant aluminum entrances and storefronts.

1.2 RELATED SECTIONS

- A. Section 07920 - Sealants: Sealant product and installation requirements.
- B. Section 08810 - Glass and Glazing: Glass and glazing requirements.

1.3 REFERENCES

- A. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- C. ASTM B368 - Standard Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test).
- D. ASTM C 236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.
- E. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- F. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- G. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- H. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

1.4 STOREFRONT SYSTEM

- A. Performance: Provide aluminum storefront systems that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with test method indicated.
 - 1. Wind Loads: Completed storefront system shall withstand positive and negative wind and service pressure loads normal to wall plane.
 - 2. Thermal Movement: Provide for thermal movement caused by 180 degrees F. (82.2 degrees C.) surface temperature, without causing buckling stresses on glass, joint seal

- failure, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or detrimental effects.
3. Deflection: Maximum allowable deflection in any member when tested in accordance with ASTM E 330-90 with allowable stress in accordance with AA Specifications for Aluminum Structures.
 - a. Without Horizontals: $L/175$ or 3/4 inch (19.1mm) maximum. .
 - b. With Horizontals: $L/175$ or $L/240 + 1/4$ inch (6.4mm) for spans greater than 13 feet-6 inches (4.1m) but less than 40 feet-0 inch (12.2m).
 4. Air Infiltration: When tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 PSF (299 Pa), completed storefront systems shall have maximum allowable infiltration of 0.03 CFM/FT² (0.56 m³/h*m²).
 5. Air Infiltration: When tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 PSF (299 Pa), completed storefront systems shall have maximum allowable infiltration of 0.02 CFM/FT² (0.37 m³/h*m²).
 6. Air Infiltration: When tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 PSF (299 Pa), completed storefront systems shall have maximum allowable infiltration of 0.01 CFM/FT² (0.19 m³/h*m²).
 7. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 10 PSF (479 Pa).
 8. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 12 PSF (718 Pa).
 9. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 15 PSF (718 Pa).
 10. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 25 PSF (1197 Pa).
 11. Thermal Performance: When tested in accordance with AAMA 1503.1-88 and ASTM C 236-89:
 - a. Condensation Resistance Factor (CRF): A minimum of 60.
 - b. Thermal Transmittance U Value: 0.46 BTU/HR/FT²/ degrees F or less (frame only).
 - c. Condensation Resistance Factor (CRF): A minimum of 61.
 - d. Thermal Transmittance U Value: 0.42 BTU/HR/FT²/ degrees F or less (frame only).
 - e. Condensation Resistance Factor (CRF): A minimum of 63.
 - f. Thermal Transmittance U Value: 0.46 BTU/HR/FT²/ degrees F or less (frame only).
- B. Provide aluminum storefront systems that comply with South Florida Building Code Protocol PA 202-94.
1. Air Infiltration: Completed storefront systems shall have 0.01 CFM/FT² (0.18 m³/h*m²) maximum allowable infiltration when tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 psf (299 Pa).
 2. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 10 psf (479 Pa). Water test to be performed immediately after design pressure test.
 3. Wind Loads: Completed storefront system shall withstand wind pressure loads normal

- to wall plane indicated:
- a. Exterior Walls:
 - 1) Positive Pressure: 65 psf (3.1kPa).
 - 2) Negative Pressure: 65 psf (3.1kPa).
 4. Deflection: Maximum allowable deflection in any member when tested in accordance with ASTM E 330-90 with allowable stress in accordance with AA Specifications for Aluminum Structures.
 - a. Without Horizontals: L/175 or 3/4 inch (19.1mm) maximum. .
 - b. With Horizontals: L/175 or L/240 + 1/4 inch (6.4mm) for spans greater than 13 feet-6 inches (4.1m) but less than 40 feet-0 inch (12.2m).
 5. Thermal Movement: Provide for thermal movement caused by 180 degrees F. (82.2 degrees C.) surface temperature, without causing buckling stresses on glass, joint seal failure, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or detrimental effects.
- C. Provide aluminum storefront systems that comply with South Florida Building Code Protocol PA 201-94, PA 202-94 and PA 203-94.
1. Air Infiltration: Completed storefront systems shall have 0.02 CFM/FT² (0.37 m³/h*m²) maximum allowable infiltration when tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 psf (299 Pa).
 2. Air Infiltration: Completed storefront systems shall have 0.04 CFM/FT² (0.74 m³/h*m²) maximum allowable infiltration when tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 psf (299 Pa).
 3. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 12 psf (575 Pa). Water test to be performed immediately after design pressure test.
 4. Wind Loads: Completed storefront system shall withstand wind pressure loads normal to wall plane indicated:
 - a. Exterior Walls: with steel reinforcing.
 - 1) Positive Pressure: 70 psf (3.4 kPa).
 - 2) Negative Pressure: 90 psf (4.3 kPa).
 - b. Exterior Walls: without steel reinforcing.
 - 1) Positive Pressure: 50 psf (2.4 kPa).
 - 2) Negative Pressure: 70 psf (3.4 kPa).
 5. Deflection: Maximum allowable deflection in any member when tested in accordance with ASTM E 330-90 with allowable stress in accordance with AA Specifications for Aluminum Structures.
 - a. Without Horizontals: L/175 or 3/4 inch (19.1mm) maximum. .
 - b. With Horizontals: L/175 or L/240 + 1/4 inch (6.4mm) for spans greater than 13 feet-6 inches (4.1m) but less than 40 feet-0 inch (12.2m).
 6. Thermal Movement: Provide for thermal movement caused by 180 degrees F. (82.2 degrees C.) surface temperature, without causing buckling stresses on glass, joint seal failure, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or detrimental effects.

1.5 ENTRANCE SYSTEM

- A. Provide aluminum swing doors that comply with the following performance requirements:
1. Air Infiltration (Single Acting Butt Hinges or Offset Pivots): Air infiltration shall be tested in accordance with ASTM E283-91 at static pressure of 1.57 PSF (75 Pa).

Infiltration shall not exceed the following:

- a. 20D Single Doors: 0.18 CFM/FT (1.02 m³/h*m) of crack length.
 - b. 20D Pair of Doors: 0.27 CFM/FT (1.53 m³/h*m) of crack length.
 - c. 40D Single Doors: 0.40 CFM/FT (2.27 m³/h*m) of crack length.
 - d. 40D Pair of Doors: 1.22 CFM/FT (6.92 m³/h*m) of crack length.
 - e. 35D/50D Single Doors: 0.43 CFM/FT (2.44 m³/h*m) of crack length.
 - f. 35D/50D Pair of Doors: 0.50 CFM/FT (2.83 m³/h*m) of crack length.
2. Structural: Door corner structural strength test using a dual moment loading criteria:
 - a. Model: 20D Swing Door; 245 lbs (111 kg).
 - b. Model: 35D Swing Door; 290 lbs (132 kg).
 - c. Model: 40D Swing Door; 470 lbs (213 kg).
 - d. Model: 50D Swing Door; 300 lbs (136 kg).
 3. Structural Uniform Load Test:
 - a. Single Doors: 90 psf (4.3 kPa).
 - b. Pair of Doors: 90 psf (4.3 kPa).
 4. Structural Uniform Load Test:
 - a. Single Doors: +90/-104 psf (4.3 kPa/-4.98 kPa).
 - b. Pair of Doors: +45/-45 psf (4.3 kPa/-2.2kPa).
 5. Forced Entry Resistance: 300 lbs (136 kg) satisfactory.
- B. Provide aluminum single acting swing doors that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with South Florida Building Code Protocol PA 202-94:
1. Air Infiltration: Air infiltration shall be tested in accordance with ASTM E 283-91 at static pressure of 6.24 psf (299 Pa). Infiltration shall not exceed the following:
 - a. 20DH Single Doors: 0.68 cfm/ft² based on a door size of 3 feet by 7 feet (1.1 m).
 - b. 35DH Single Doors: 0.04 cfm/linear feet of crack based on a door size of 4 feet by 8 feet (1.4 m).
 2. Structural: Door corner structural strength test using a dual moment loading criteria:
 - a. Model: 20DH Swing Door; 290 lbs (132 kg).
 - b. Model: 35DH Swing Door; 290 lbs (132 kg).
 3. Structural Uniform Load Test:
 - a. Positive: 65 psf (3.1kPa).
 - b. Negative: 65 psf (3.1kPa).
 - c. Positive: 56 psf (2.7kPa).
 - d. Negative: 70 psf (3.4 kPa).
 4. Forced Entry Resistance: Tests performed simultaneously with 300 lbs (136 kg) forces applied to the active door panel within 3 inches of the locks in the direction that would tend to open the door while 150 lbs (68 kg) forces were applied in both perpendicular directions to the 300 lbs (136 kg) force simultaneously.
- C. Provide aluminum single acting swing doors that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with South Florida Building Code Protocol PA 201-94, PA 202-94 and PA 203-94.
1. Air Infiltration: Air infiltration shall be tested in accordance with ASTM E 283 at static pressure of 6.24 psf (299 Pa). Infiltration shall not exceed the following:
 - a. 0.065 cfm/linear foot of crack based on a door size of 3 feet 6 inches by 8 feet (1.1 m by 2.4 m).
 2. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component tested in accordance with ASTM E 331 at a test pressure differential of

- 10 psf (479 Pa). Water test to be performed immediately after design pressure test.
3. Structural: Door corner structural strength test using a dual moment loading criteria:
 - a. Test results shall be supported by an independent laboratory report as follows:
470 lbs.
 4. Structural Uniform Load Test:
 - a. Doors:
 - 1) Positive Pressure: 70 psf (3.4 kPa).
 - 2) Negative Pressure: 90 psf (4.3 kPa).
 5. Forced Entry Resistance: Tests performed simultaneously with 300 lbs (136 kg) forces applied to the active door panel within 3 inches of the locks in the direction that would tend to open the door while 150 lb (68 kg) forces are applied in both perpendicular directions to the 300 lbs (136 kg) force simultaneously.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data - Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings:
 1. Drawings showing layout, profiles, and product components, including anchorage, accessories, finish colors and textures.
- D. Certifications:
 1. Submit certified test reports showing compliance with specified performance characteristics and physical properties.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- G. Project Record Documents: Submit project record documents for installed materials in accordance with Section 01700 - Project Closeout (Project Record Documents) Section.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 1. Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.
- B. Installer Qualifications:
 1. Installer experienced to perform work of this section that has specialized in the installation of work similar to that required for this project.
 2. Submit reference list of completed projects.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 1. Install at project site a job mock-up using acceptable products and manufacturer

- approved installation methods in location designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.10 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.
 1. Beneficiary: Issue warranty in the legal name of the project Owner.
 2. Warranty Period: Ten (10) years commencing on Date of Substantial Completion.
 3. Warranty Acceptance: Owner is sole authority who will determine acceptability of manufacturer's warranty documents.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 1. YKK AP America, Inc.
 2. Kawneer Co., Inc.
 3. EFCO Corporation
- B. Coordinate with requirements of Division 1 section on product options and substitutions.
- C. Substitutions: Or Equal.
- D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 STOREFRONT APPLICATIONS/SCOPE

- A. Center set, flush glazed; jambs continuous; head, sill, and jamb attached by screws into rough opening.
- B. Center set, flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum expansion mullions, 90 degree corner posts, three way corner post, entrance door framing, and indicated shapes.
- C. Center set, flush glazed; head and sill members continuous; intermediate horizontals attached

by means of shear block. Jamb and vertical mullions are captured inside the continuous head and sill members and held in place by filler inserts. Manufacturer's standard extruded aluminum expansion mullions, 0 - 15 degree hinged mullions, 90 degree corner posts, entrance door framing, and indicated shapes.

- D. Center rabbet, exterior flush glazed; jamb and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum expansion mullions, 0- 15 degree hinged mullions, 90 degree corner posts, flexible corner posts, three way corner post, 93- 170 degree flexible corner posts, entrance door framing, and indicated shapes.
- E. Center set, exterior flush glazed; jamb and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum mullions, 90 degree corner posts, entrance door framing, and indicated shapes. Provide continuous thermal barrier by means of 6/6 nylon polyamide glass fiber reinforced pressure extruded bars. Systems employing non-structural thermal barriers are not acceptable.
- F. Center set, exterior flush glazed; jamb and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery or shear block attachment. Manufacturer's standard extruded aluminum mullions, 90 degree corner posts, entrance door framing, and indicated shapes. Provide continuous thermal barrier by means of a poured and debridged pocket consisting of a two-part, chemically curing high density polyurethane which is bonded to the aluminum by YKK ThermoBond Plus. Systems employing non-structural thermal barriers are not acceptable.
- G. Hurricane resistant. Center rabbet, exterior flush glazed; jamb and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum mullions, entrance doors, framing, and indicated shapes.
- H. Thermally broken, exterior flush glazed; horizontal and vertical framing members shall have a nominal face dimension of 1-3/4 inches (44.5 mm). Intermediate horizontals attached by screw spline and/or shear block joinery with concealed fasteners. Manufacturer's standard extruded aluminum mullions, entrance door framing, and indicated shapes.
- I. Impact resistant. Center set, exterior flush glazed; jamb and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Continuous and wept sill flashing. Manufacturer's standard extruded aluminum mullions, entrance doors, framing, and indicated shapes, perimeter anchor fillers and steel reinforcing as required.
 - 1. Glass for Large Missile Impact:
 - a. 1/4 inch (6 mm) or 3/8 inch (9.5 mm) glass with DuPont SentryGlas Composite laminate.
 - b. 7/16 inch (11 mm) or 9/16 inch (14.3 mm) Saf-Glas by Security Impact Glass. Annealed, heat strengthened, or tempered as required unless otherwise noted.
 - c. 9/16 inch (14.3 mm) Solutia Saflex HP (heat strengthened only).
 - d. 9/16 inch (14.3 mm) laminated glass with 0.090 inch PVB interlayer (heat strengthened only).
 - 2. Glass for Small Missile Impact:
 - a. 9/16 inch (14.3 mm) laminated glass with 0.060 inch (1.5 mm) PVB interlayer (heat strengthened only).
 - 3. Glazing: Manufacturer's standard glazing stops with EPDM glazing gaskets to prevent water infiltration at the exterior and Dow 995 Structural Silicone Adhesive with fixed

stops at the interior.

- J. Impact resistant. Center set, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Continuous and wept sill flashing. Manufacturer's standard extruded aluminum mullions, entrance doors, framing, and indicated shapes, perimeter anchor fillers and steel reinforcing as required.
1. Glass for Large Missile Impact at 50 psf:
 - a. 1-5/16 inches (33 mm) Solutia Saflex with 0.090 inch (2.3 mm) PVB interlayer (heat strengthened only).
 - b. 1-5/16 inches (33 mm) laminated glass with 0.090 inch (2.3 mm) Butacite PVB interlayer (heat strengthened only).
 2. Glass for Large Missile Impact at 70 psf:
 - a. 1 inch (25 mm) glass with DuPont SentryGlas Composite laminate.
 - b. 1-5/16 inches (33 mm) Saf-Glas by Security Impact Glass with 0.070 inch (1.8 mm) Polycarbonate interlayer. Annealed, heat strengthened, or tempered as required unless otherwise noted.
 - c. 1-5/16 inches (33 mm) Solutia Saflex HP with 0.100 inch (2.5 mm) PVB interlayer (heat strengthened only).
 3. Glass for Small Missile Impact:
 - a. 1-5/16 inches (33 mm) Solutia Saflex with 0.060 inch (1.5 mm) PVB interlayer (heat strengthened only).
 - b. 1-5/16 inches (33 mm) laminated glass with 0.060 inch (1.5 mm) Butacite PVB interlayer (heat strengthened only).
 4. Glazing: Dow Corning 995 Structural Silicone Adhesive.

2.3 ENTRANCE APPLICATIONS/SCOPE

- A. Standard Entrances: Narrow Stile Swing Doors; Medium Stile Swing Doors; Heavy Duty Stile Swing Doors; Wide Stile Swing Doors
1. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.
 2. Glazing Stops: Manufacturer's standard snap-in glazing stops with EPDM glazing gaskets to prevent water infiltration.
 3. Weatherstripping: Manufacturer's standard pile type in replaceable rabbets for stiles; manufacturer's standard EPDM bulb type in door frames.
 4. Hardware: Manufacturer's standard as selected by Architect.
- B. Hurricane Resistant Doors:
1. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.
 2. Glazing Stops: Manufacturer's standard snap-in glazing stops with EPDM glazing gaskets to prevent water infiltration.
 3. Weatherstripping: Manufacturer's standard pile type in replaceable rabbets for stiles; manufacturer's standard EPDM bulb type in door frames.
 4. Hardware (Per Leaf):
 - a. (1-1/2) pair mortise butt hinges, Ball bearing, 4-1/2 by 4, (H-2301).
 - b. (1) Adams Rite MS1850 three point hook bolt lock.
 - c. (2) H-4202 Keyed cylinders (H-4204 thumb turn on inside optional).
 - d. (1) Set type "A" standard YKK AP push/pull.
 - e. (1) Type "C" 1 inch diameter tubular push/pull.
 - f. (1) E9-0482 mill finish aluminum threshold with E2-0051 elastomer weather-

strip, wept, and counterflashed.

- C. Impact Resistant Doors:
1. Glass for Large Missile Impact:
 - a. 1/4 inch (6 mm) or 3/8 inch (9.5 mm) glass with DuPont SentryGlas Composite laminate.
 - b. 9/16 inch (14 mm) DuPont SentryGlas Plus.
 - c. 7/16 inch (11 mm) or 9/16 inch (14 mm) Saf-Glas by Security Impact Glass; Annealed, heat strengthened, or tempered as required.
 2. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.
 3. Glazing: Manufacturer's standard glazing stops with EPDM glazing gaskets to prevent water infiltration at the exterior and Dow 995 Structural Silicone Adhesive with fixed stops at the interior.
 4. Weather-stripping: Manufacturer's standard elastomer type in replaceable rabbets for stiles and rails.
 5. Hardware:
 - a. (1-1/2 to 2) pair of Grade 1 mortise butt hinges per leaf. Ball bearing 4-1/2 by 4 Brass US26D finish.
 - b. (1) Adams Rite MS1850 three point hook bolt lock on active leaf or single door.
(1) Adams Rite two point lock on inactive leaf.
 - c. (2) H-4202 Keyed cylinders (H-4204 thumb turn on inside optional).
 - d. Type "A" standard YKK AP push/pull.
 - e. Type "C" 1 inch (25 mm) diameter tubular push/pull.
 - f. LCN 4040 surface mounted closer (hold open optional).
 - g. (1) E9-0502 mill finish aluminum threshold with E9-0503 adapter and E2-0051 elastomer weather-strip, counterflashed using E9-0616 extruded aluminum flashing. Threshold and flashing are wept to the exterior.

1.2 MATERIALS

- A. Extrusions: ASTM B 221 (ASTM B 221M), 6063-T5 Aluminum Alloy.
- B. Aluminum Sheet:
1. Anodized Finish: ASTM B 209 (ASTM B 209M), 5005-H14 Aluminum Alloy, 0.050 inch (1.27 mm) minimum thickness.
 2. Painted Finish: ASTM B 209 (ASTM B 209M), 3003-H14 Aluminum Alloy, 0.080 inch (1.95 mm) minimum thickness.
- C. Accessories:
1. Fasteners: Zinc plated steel concealed fasteners; Hardened aluminum alloys or AISI 300 series stainless steel exposed fasteners, countersunk, finish to match aluminum color.
 2. Sealant: Non-skinning type, AAMA 803.3.
 3. Glazing: Setting blocks, edge blocks, and spacers in accordance with ASTM C 864, shore durometer hardness as recommended by manufacturer; Glazing gaskets in accordance with ASTM C 864.

1.3 FABRICATION

- A. Frame Construction:
1. Fabricate and assemble units with joints only at intersection of aluminum members

- with uniform hairline joints; rigidly secure, and sealed in accordance with manufacturer's recommendations.
2. Hardware: Drill and cut to template for hardware. Reinforce frames and door stiles to receive hardware in accordance with manufacturer's recommendations.
 3. Welding: Conceal welds on aluminum members in accordance with AWS recommendations or methods recommended by manufacturer. Members showing welding bloom or discoloration on finish or material distortion will be rejected.
- B. Door Construction:
1. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.
 2. Glazing Stops: Manufacturer's standard snap-in glazing stops with EPDM glazing gaskets to prevent water infiltration.
 3. Weatherstripping: Manufacturer's standard pile type in replaceable rabbets for stiles; manufacturer's standard EPDM bulb type in door frames.
 4. Hardware: Manufacturer's standard as selected by Architect.
- C. Fabrication Tolerances:
1. Material Cuts: Square to 1/32 inch (0.8 mm) off square, maximum, over largest dimension; proportionate amount of
 2. 1/32 inch (0.8 mm) on other two dimensions.
 3. Maximum Offset: 1/64 inch (0.4 mm) in alignment between two consecutive members in line, end to end.
 4. Maximum Offset: 1/64 inch (0.4 mm) between framing members at glazing pocket corners.
 5. Joints (Between adjacent members in same assembly): Hairline and square to adjacent member.
 6. Variation (In squaring diagonals for doors and fabricated assemblies): 1/16 inch (1.6 mm).
 7. Flatness (For doors and fabricated assemblies): +/- 1/16 inch (+/- 1.6 mm) off neutral plane.

1.4 FINISH

- A. Anodized Finishing: Prepare aluminum surfaces for specified finish; apply shop finish in accordance with the following:
1. Anodic Coating: Electrolytic color coating followed by an organic seal applied in accordance with the requirements of AAMA 612-02. Aluminum extrusions shall be produced from quality controlled billets meeting AA-6063-T5.
 - a. Exposed Surfaces shall be free of scratches and other serious blemishes.
 - b. Extrusions shall be given a caustic etch followed by an anodic oxide treatment and then sealed with an organic coating applied with an electrodepositing process.
 - c. The anodized coating shall comply with the requirements of AAMA 612-02: Voluntary Specifications, Performance Requirements and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum. Testing shall demonstrate the ability of the finish to resist damage from mortar, salt spray, and chemicals commonly found on construction sites, and to resist the loss of color and gloss.
 - d. Overall coating thickness for finishes shall be a minimum of 0.7 mils (.018 mm).
 2. CASS Corrosion Resistance Test, CASS 240/ASTM B368 Test Method.
 3. AAMA 2605 Performance Tests:

- a. 7.3 Dry Film Hardness.
 - b. 7.8.2 Salt Spray Resistance.
 - c. 7.9.1.2 Color Retention, South Florida.
 - d. 7.9.1.4 Gloss Retention, South Florida.
- B. High Performance Organic Coating Finish:
1. Type Factory applied two-coat 70 percent Kynar resin by Auto Chem or 70 percent Hylar resin by Ausimont, fluoropolymer based coating system, Polyvinylidene Fluoride (PVF-2), applied in accordance with YKK AP procedures and meeting AAMA 2605 specifications.
 2. Colors: Selected by Architect from the following:
 - a. Standard coating color charts.
 - b. Custom coating color charts.
 - c. Color Name and Number:
- C. Finishes Testing:
1. Apply 0.5 percent solution NaOH, sodium hydroxide, to small area of finished sample area; leave in place for sixty minutes; lightly wipe off NaOH; Do not clean area further.
 2. Submit samples with test area noted on each sample.

PART 2 EXECUTION

2.1 EXAMINATION

- A. Do not begin installation until openings have been properly prepared.
- B. If opening preparation is the responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.
- C. Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

2.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install manufacturer's system in accordance with shop drawings, and within specified tolerances.
 1. Protect aluminum members in contact with masonry, steel, concrete, or dissimilar materials using nylon pads or bituminous coating.
 2. Shim and brace aluminum system before anchoring to structure.
 3. Seal metal to metal sash joints using sealant recommended by system manufacturer.
 4. Verify storefront system allows water entering system to be collected in gutters and wept to exterior.
 5. Locate expansion mullions where indicated on reviewed shop drawings.
- C. Manufacturer's Field Services: Provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

2.3 TESTING

- A. Field Test: Conduct field test to determine water tightness of storefront and entrance system. Conduct test in accordance with AAMA 501.3-94 at locations selected by Architect.
 - 1. Perform minimum of _____ (verify with Architect) tests. Perform test in Architect's presence.

2.4 PROTECTION

- A. Adjust swing doors for operation in accordance with manufacturer's recommendations.
- B. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance, and remove construction debris from project site. Legally dispose of debris.
- C. Protect the installed product's finish surfaces from damage during construction.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION