

**saPART 1 GENERAL****1.01 SUMMARY**

- A. Section Includes: Aluminum Storefront, including:
1. YKK AP Series YES 45 FS Storefront System (Monolithic Glazing)
  2. YKK AP Series YES 45 FI Storefront System (Insulating Glazing)
- B. Related Sections:
1. Sealants: Refer to Division 7 Joint Treatment Section for sealant requirements.
  2. Glass and Glazing: Refer to Division 8 Glass and Glazing Section for glass and glazing requirements.
  3. Single Source Requirement: All products listed below shall be by the same manufacturer.
    - a. Section 08 32 13 Sliding Aluminum - Framed Glass Doors
    - b. Section 08 51 13 Aluminum Windows.
    - c. Section 08 44 13 Glazed Aluminum Curtain Walls.
    - d. Section 08 44 33 Sloped Glazing Assemblies.

**1.02 SYSTEM PERFORMANCE DESCRIPTION**

- A. Performance Requirements: Provide aluminum storefront systems that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with test method indicated.
1. Air Infiltration: When tested in accordance with ASTM E 283 at differential static pressure of 6.24 PSF (299 Pa), completed storefront systems shall have maximum allowable infiltration of:
    - a. 0.06 CFM/FT<sup>2</sup> (1.10 m<sup>3</sup>/h•m<sup>2</sup>) for YES 45 FS systems.
    - b. 0.06 CFM/FT<sup>2</sup> (1.10 m<sup>3</sup>/h•m<sup>2</sup>) for YES 45 FI systems.
  2. Water Infiltration: No uncontrolled water when tested in accordance with ASTM E 331 at test pressure differential of:
    - a. 10 PSF (479 Pa) for YES 45 FS systems.
    - b. 12 PSF (575 Pa) for YES 45 FI systems.
    - c. 10 PSF (479 Pa) for YES 45 FS/FI Can/Ribbon Assembly only.  
(or when required, field tested in accordance with AAMA 503). Fastener Heads must be seated and sealed against Sill Flashing on any fasteners that penetrate through the Sill Flashing.
  2. Wind Loads: Completed storefront system shall withstand wind pressure loads normal to wall plane indicated:
    - a. Exterior Walls:
      - 1) Positive Pressure:
      - 2) Negative Pressure:
    - b. Interior Walls (Pressure Acting in Either Direction):
  4. Deflection: Maximum allowable deflection in any member when tested in accordance with ASTM E 330 with allowable stress in accordance with AA Specifications for Aluminum Structures.
    - a. Without Horizontals: L/175 or 3/4" (19.1mm) maximum. .
    - b. With Horizontals: L/175 or L/240 + 1/4" (6.4mm) for spans greater than 13'-6" (4.1m) but less than 40'-0" (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.
  6. Thermal Performance: When tested in accordance with AAMA 1503 and NFRC 100:
    - a. Condensation Resistance Factor (CRF<sub>f</sub>): A minimum of 58 for YES 45 FI systems.
    - b. Thermal Transmittance U Value: 0.53 BTU/HR/FT<sup>2</sup>/°F or less for YES 45 FI systems.

Note: Thermal Performance for the glazed system as a whole will be affected by the characteristics of the glass specified.

**1.03 SUBMITTALS**

- A. General: Prepare, review, approve, and submit specified submittals in accordance with "Conditions of the Contract" and Division 1 Submittals Sections. Product data, shop drawings, samples, and similar submittals are defined in "Conditions of the Contract."



- B. Product Data: Submit product data for each type storefront series specified.
- C. Substitutions: Whenever substitute products are to be considered, supporting technical data, samples, and test reports must be submitted ten (10) working days prior to bid date in order to make a valid comparison.
- D. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including anchorage, accessories, finish colors and textures.
- E. Samples: Submit verification samples for colors on actual aluminum substrates indicating full color range expected in installed system.
- F. Quality Assurance / Control Submittals:
  - 1. Test Reports: Submit certified test reports showing compliance with specified performance characteristics and physical properties.
  - 2. Installer Qualification Data: Submit installer qualification data.
- G. Closeout Submittals:
  - 1. Warranty: Submit warranty documents specified herein.
  - 2. Project Record Documents: Submit project record documents for installed materials in accordance with Division 1 Project Closeout (Project Record Documents) Section.

#### 1.04 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project. If requested by Owner, submit reference list of completed projects.
  - 2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction process.
- B. Mock-Ups (Field Constructed): Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color, and workmanship standard.
  - 1. Mock-Up Size:
  - 2. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
  - 3. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.
- C. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

#### 1.05 PROJECT CONDITIONS / SITE CONDITIONS

- A. Field Measurements: 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.

#### 1.06 WARRANTY

- A. Project Warranty: Refer to "Conditions of the Contract" for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by an authorized company official.
  - 1. Warranty Period: Manufacturer's one (1) year standard warranty commencing on the substantial date of completion for the project provided that the warranty, in no event, shall start later than six (6) months from the date of shipment by YKK AP America Inc.

*EDITOR NOTE: Longer warranty periods are available at additional cost.*

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS (Acceptable Manufacturers/Products)

- A. Acceptable Manufacturers:
  - YKK AP America Inc.
  - 101 Marietta Street NW, Suite 2100
  - Atlanta, GA 30303



Telephone: (678) 838-6000; Fax: (678) 838-6001

1. Storefront System: YKK AP YES 45 FS Storefront System.
2. Storefront System: YKK AP YES 45 FI Storefront System.
- B. Storefront Framing System:
  1. Description: Center rabbet, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery.
  2. Optional Can/Ribbon Assembly: Center set, flush glazed; head and sill members continuous; intermediate horizontals attached by means of shear block. Jambs and vertical mullions are captured inside the continuous head and sill members and held in place by filler inserts.
  3. Components: 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.

## 2.02 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" (1.27 mm) minimum thickness.
  2. Painted Finish: ASTM B 209 (ASTM B 209M), 3003-H14 Aluminum Alloy, 0.080" (1.95 mm) minimum thickness.

## 2.03 ACCESSORIES

- A. Manufacturer's Standard Accessories:
  1. Fasteners: Zinc plated steel concealed fasteners; Hardened aluminum alloys or AISI 300 series stainless steel exposed fasteners.
  2. 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.
  3. 0.050 Aluminum Sill Flashing End Dams must have 3-point attachment.

## 2.04 RELATED MATERIALS (Specified In Other Sections)

- A. Glass: Refer to Division 8 Glass and Glazing Section for glass materials.

## 2.05 FABRICATION

- A. Shop Assembly: 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.
  1. Hardware: Drill and cut to template for hardware. Reinforce frames and door stiles to receive hardware in accordance with manufacturer's recommendations.
  2. 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.

## 2.06 FINISHES AND COLORS

- A. YKK AP America Anodized Plus® Finish:

CODE	DESCRIPTION
YS1N*	Clear Anodized Plus®
YH3N	Champagne Anodized Plus®
YB1N	Medium Bronze Anodized Plus®
YB5N*	Dark Bronze Anodized Plus®
YK1N*	Black Anodized Plus®
YW3N	White Anodized Plus®
M	Mill Finish

\* Indicates standard finish usually carried as inventory.

Anodized Plus® is an advanced sealing technology that completely seals the anodic film yielding superior durability (See AAMA 612).



- B. 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. 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 electrodeposition process.
    - c. The anodized coating shall comply with all of the requirements of AAMA 612: 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.
      - 2) CASS Corrosion Resistance Test, CASS 240/ASTM B368 Test Method.
      - 3) Other AAMA 2605 Performance Tests specified in these specifications, such as: 7.3 Dry Film Hardness; 7.8.2 Salt Spray Resistance; 7.9.1.2 Color Retention, South Florida; 7.9.1.4 Gloss Retention, South Florida.
- C. High Performance Organic Coating Finish:
1. Type Factory applied two-coat 70% Kynar resin by Arkema or 70% Hylar resin by Solvay Solexis, 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:
- D. Finishes Testing:
1. Apply 0.5% 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 3 EXECUTION

### 3.01 MANUFACTURER'S INSTRUCTIONS / RECOMMENDATIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, installation instructions, and product carton instructions. Latest Installation Instructions can be found at [www.ykkap.com](http://www.ykkap.com).

### 3.02 EXAMINATION

- A. Site Verification of Conditions: Verify conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions.

### 3.03 PREPARATION

- A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
1. Aluminum Surface Protection: Protect aluminum surfaces from contact with lime, mortar, cement, acids, and other harmful contaminants.

### 3.04 INSTALLATION

- A. General: 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. Provide sill flashing at exterior storefront systems. Extend extruded flashing continuous with splice



joints; set in continuous beads of sealant.

4. Verify storefront system allows water entering system to be collected in gutters and wept to exterior. Verify metal joints are sealed in accordance with manufacturers installation instructions.
5. Locate expansion mullions where indicated on reviewed shop drawings.
6. Seal metal to metal storefront system joints using sealant recommended by system manufacturer.

### **3.05 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Services: Upon request, provide manufacturer's field service consisting of site visit for inspection of product installation in accordance with manufacturer's instructions.
- B. Field Test: Conduct field test to determine watertightness of storefront system. Conduct test in accordance with AAMA 501.2.

### **3.06 ADJUSTING AND CLEANING**

- A. Adjusting: Adjust swing doors for operation in accordance with manufacturer's recommendations.
- B. Cleaning: The General Contractor shall 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. Protection: The General Contractor shall protect the installed product's finish surfaces from damage during construction.

### **END OF SECTION**

This document supersedes all previous versions.