

**SECTION 08 41 23**

**FIRE RATED ALUMINUM FRAMED ENTRANCES AND STOREFRONTS**

**PART 1 – GENERAL**

**1.1 PURPOSE**

- A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

**1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS**

- A. X

**1.3 SUMMARY**

- A. Section includes:
  - 1. Fire rated glazing and framing systems.
  - 2. Related Sections
    - a). Section 01 74 19 – Construction Waste Management
    - b). Section 01 81 13 – LEED / Sustainable Design Requirements: Certification level and certification requirements for materials and products within this Section.
    - c). Section 05 12 00 – Structural Steel Framing.
    - d). Section 05 50 00 – Metal Fabrications.
    - e). Section 07 84 00 – Firestopping.
    - f). Section 08 11 13 – Hollow Metal Doors and Frames.
    - g). Section 08 71 00 – Door Hardware.

**1.4 REFERENCES**

- A. American Society for Testing and Materials (ASTM)
  - 1. Fire safety related
    - a. ASTM E119: Methods for Fire Tests of Building Construction and Materials; current edition.
    - b. ASTM E2074: Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies; current edition.
      - 1) Material related
        - a) ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; current edition.
        - b) ASTM A1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; current edition.
  - 2. American Welding Society (AWS)
    - a. AWS D1.3 - Structural Welding Code - Sheet Steel; current edition.
  - 3. Builders Hardware Manufacturers Association, Inc.; current edition.
    - a. BHMA A156 - American National Standards for door hardware; (ANSI/BHMA A156); current edition.
  - 4. National Fire Protection Association (NFPA):
    - a. NFPA 80: Fire Doors and Windows; current edition.
    - b. NFPA 251: Fire Tests of Building Construction & Materials; current edition.
    - c. NFPA 252: Fire Tests of Door Assemblies; current edition.
  - 5. Underwriters Laboratories, Inc. (UL):
    - a. UL 9: Fire Tests of Door Assemblies; current edition.
    - b. UL 10 B: Fire Tests of Door Assemblies; current edition.
    - c. UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies; current edition.
    - d. UL 263: Fire tests of Building Construction and Materials; current edition.
  - 6. American National Standards Institute (ANSI):

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- a. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings; current edition.
7. Consumer Product Safety Commission (CPSC):
  - a. CPSC 16 CFR 120: Safety Standard for Architectural Glazing Materials; current edition.
8. American Society of Civil Engineers (ASCE)
  - a. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; current edition.

### 1.5 PERFORMANCE REQUIREMENTS

#### A. Fire Rating Requirements

1. Duration - Doors: Capable of providing a fire rating for 90 minutes.
2. Duration - Walls: Capable of providing a fire rating for 120 minutes.
3. Delegated design: For the performance requirements listed below requiring structural design provide data, calculations and drawings signed and sealed by an engineer licensed in the state where the project is located.
4. Structural Performance
  - a. Design and size the system to withstand structural forces placed upon it without damage or permanent set when tested in accordance with ASTM E330 using load 1.5 times the design wind loads and of 10 seconds in duration.
  - b. Positive wind load: As indicated on the drawings.
  - c. Negative wind Load: As indicated on the drawings
  - d. Member deflection: Limit deflection of the edge of the glass normal to the plane of the glass to 1/175 of the glass edge length or 3/4 inch, whichever is less of any framing member
  - e. Accommodate movement between storefront and adjoining systems.

### 1.6 SUBMITTALS

- A. See Division 01 for submittal procedures.
- B. Product Data: Include laboratory test data.
- C. Shop Drawings:
  1. Indicate Include plans, elevations and details of product showing component dimensions; framed opening requirements, dimensions, tolerances, and attachment to structure.
  2. Provide templates for the location of embeds and anchor locations required for any adjoining work.
  3. Hardware schedule: List of manufacture supplied hardware and verification of cylinder size complying with Section 08 71 00.
  4. Samples Color Selection: For aluminum frames with factory-applied powder coat color finishes.
  5. Triplicate copies of manufacturer's powder coating color charts showing the full range of colors available.
  6. Verification Sample of selected finish on aluminum sample piece.
  7. Samples: For following products:
    - a). Two 8-inch by 10-inch Samples for glass.
  8. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
  9. Technical Information: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions. Including blank warranty form.
  10. Installer Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
  11. Manufacturer's Certificate
  12. Field Quality-control reports:
  13. Maintenance Data
  14. Warranties: Submit manufacturer's warranty and ensure that forms have been completed in the Owner's name and registered with the manufacturer.
- D. Documentation for LEED Credit MR 4.1 and Credit MR 4.2: For products having recycled content. Indicate percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
- E. Documentation for LEED Credit MR 5.1 and Credit MR 5.2: For products that are extracted, harvested or recovered and manufactured from within 500 miles of Project. Indicate location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw or recycled material. Include statement indicating costs for each product that is regionally extracted, harvested or recovered and manufactured.

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- F. Documentation for LEED Credit EQ 4.1 and 4.2: Interior paints, coatings, adhesives, sealants, stains, caulk, firestopping, etc. applied on site must comply with the VOC limits in Section 01 81 13. Provide product data sheet or MSDS clearly showing VOC content of product in grams/Litre.

### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Not less than 10 years of experience in manufacturing components of the types specified.
- B. Installer Qualifications: Minimum five years documents experience installing glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- C. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- D. Certification: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
  - 1. Door assemblies shall be tested to the acceptance criteria of ASTM E2074-00, NFPA 252, UL 9, UL 10-C Standard Methods of Fire Tests of Door Assemblies.
  - 2. Wall assemblies shall be tested to the acceptance criteria of ASTM E119, NFPA 251, UL 263 Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 3. Underwriters Laboratories (UL) shall conduct fire test.
  - 4. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by an approved independent agency maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.
  - 5. Door assemblies shall be marked with the hourly rating followed by the letter "S". The letter "S" indicates air leakage resistance testing conformance to UBC 7-2 Parts I and II.
  - 6. Regulatory Requirements: Comply with provisions of the following:
    - a. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG).
    - b. NFPA 101: Comply with the following for means of egress doors:
      - 1) Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
      - 2) Door Closers: Not more than 30 lbf to set door in motion and not more than 15 lbf to open door to minimum required width.

### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle under provisions specified by manufacturer.
  - 1. At delivery inspect all containers for damage.
  - 2. Examine glass and frame units for damage.
  - 3. List all damage to containers on the shipping company's Bill of Lading
  - 4. Report damage to manufacturer immediately.
  - 5. Store glazing materials and frame units in original packing containers
  - 6. Do not expose glazing material of frame units to sunlight and weather.
  - 7. Do not store horizontally.
  - 8. Place glass and frames upright, no less than 6 degrees from vertical.
  - 9. Store all materials in dry conditions, off the ground.
  - 10. Protect from construction activities.
  - 11. Fully support Glass units along entire length
  - 12. Non-abrasive pads such as cloth or cork must separate glass and frame units.
  - 13. Do not stack containers.

### 1.9 WARRANTY

- A. Provide manufacturer's limited five year warranty from the date of shipment from the factory.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURERS - FIRE RATED DOOR ASSEMBLY AND WALL ASSEMBLY

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- A. Basis of Design Glazing Material: "Pilkington Pyrostop®" fire-rated glazing manufactured by the Pilkington Group and distributed by Technical Glass Products.
- B. Basis of Design Frame System: "Fireframes® Aluminum Series" fire-rated frame system as manufactured and supplied by Technical Glass Products, <http://www.fireglass.com>.
- C. Other Manufacturers:
  - 1. Basis Alufлам; [www.alufла.com](http://www.alufла.com).
  - 2. Vetrotech; [www.vetrotech.com](http://www.vetrotech.com).
- D. Substitutions: See Division 01.

### 2.2 MATERIALS - GLASS

- A. Power Basis of Design Fire Rated Glazing: ASTM C 1036 and ASTM C 1048; composed of multiple sheets of Pilkington Optiwhite™ high visible light transmission glass laminated with an intumescent interlayer.
  - 1. Product shall contain at least 10% recycled content.
- B. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
- C. Thickness of Glazing Material: Pilkington Pyrostop® 120 minute, 2 1/4".
- D. Approximate Visible Transmission: Varies with thickness (approximate range 75 to 88 percent).
- E. Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacture, testing laboratory (UL), fire rating period, safety glazing standards, and date of manufacture.
- F. Glazing Accessories: Manufacturer's standard compression gaskets, standoff, spacers, setting blocks and other accessories necessary for a complete installation.

### 2.3 MATERIALS -ALUMINUM FRAMING

- A. Aluminum Framing System - 120 min.
  - 1. Steel Frame: Two halves, nom. 1.9 2.6 in. wide with a nom. minimum depth of 1.38 in. with lengths cut according to glazing size.
  - 2. Aluminum Trim: Nom. 2-3/4 in. wide with a nom. depth of 1.54 in., lengths cut according to glazing size.
  - 3. Stainless Steel Standoffs: Nom 5/16 in. diameter with a nom. minimum depth of 1-1/8 in.
  - 4. Stainless Steel Moment and Connecting Braces: Nom 3/8 in. thick with a nom. minimum depth of 1-1/8 in. with depth.
  - 5. Fasteners: M6 x16mm button head socket cap screws for frame assembly and #6 x 1" pan head sheet metal screws for door installation.
  - 6. Glazing Gasket: Nom. 3/4 in. by 3/16 in. black.
  - 7. Product shall contain at least 75% recycled content.

### 2.4 FABRICATION

- A. Controller: Field glaze door and frame assemblies.
- B. Factory prepare steel door assemblies field mounting of hardware
- C. Fabrication Dimensions: Fabricate fire rated assembly to field dimensions.
- D. Obtain reviewed Shop Drawings prior to fabrication.

### 2.5 FINISHES, GENERAL

- A. Electrical Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish frames after assembly.
- C. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

### 2.6 ALUMINUM FINISHES

- A. Color-Coated Finish: Manufacturer's standard powder coating finish system.
  - 1. Color and Gloss: Selected by Architect from manufacturer's full color range.
  - 2. Product shall not exceed VOC limit specified in Division 01.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

### 2.7 DOOR HARDWARE

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- A. Furnish hardware with 90 minute fire door by the manufacturer.
  - 1. All hardware BHMA Certified
  - 2. Provide high traffic areas or areas requiring a door motion force of greater than 20 pounds with power assisted hardware for use with manufacturer’s frame system.
  - 3. Hardware- Pair of Doors with Exit Device Outswing. Each pair to have the following. Note: review Security Drawings and Watchdog location. All hardware to be provided by door/frame manufacturer. Provide mounting accessories for closers. Provide Fail Safe Electrified trim.

Hardware Group No. XX.XX	Item	Each Door to Have: Description	Manufacturer	Finish * PTM
6		Weld on pivots	Technical Glass	
2	Exit devices	RX-3549A-EO-F	<u>Von Duprin</u>	<u>626</u>
1	<u>Power</u>	<u>EPT10</u>	<u>Von Duprin</u>	
2	Lever Trim	<u>3360-L-BE-17</u>	<u>Von Duprin</u>	630
1	Cylinder	ANSI mortise Schlage C keyway	Technical Glass Products	626
2	Closers	<u>4040XP REG OR PA</u> <u>AS REQ</u>	<u>LCN</u>	
1	Coordinator	GSR	Dorma	689
1	Auxiliary Fire		Technical Glass	630
1	Weather Seal	Perimeter gasket	Technical Glass	
1	<u>Wall Stop</u>	<u>WS406/407CCV</u>	<u>Ives</u>	<u>630</u>
1	<u>Door Bottom</u>	<u>320S</u>	<u>NGP</u>	<u>AL</u>
1	<u>Threshold</u>	<u>425</u>	<u>NGP</u>	<u>AL</u>

**PART 3 – EXECUTION**

3.1 EXAMINATION

- A. Verify that electric power is available and is of the correct characteristics.

3.2 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Installer shall be factory trained, certified by AAADM.
- C. Install doors units plumb, level and true to line, without warp or rack of frames or sash with manufacturer's prescribed tolerances.
- D. Provide for thermal expansion and contraction of door and frame units and live and dead loads that may be transmitted to operating equipment.
- E. Provide for dimensional distortion of components during operation.
- F. Coordinate installation of components with related and adjacent work; level and plumb.

3.3 ADJUSTING

- A. Adjust door equipment for correct function and smooth operation.
- B. Lubricate operating equipment for optimum condition and safety.
- C. AAADM certified technician to inspect and adjust installation. Comply with ANSI A156.10.

3.4 CLEANING

- A. Remove temporary protection, clean exposed surfaces.

3.5 CLOSEOUT ACTIVITIES

- A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

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3.6 MAINTENANCE

- A. Provide service and maintenance of operating equipment for one year from Date of Substantial Completion, at no extra charge to Owner.

END OF SECTION