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Tecfire Fire-Rated Aluminum-Framed Entrances and Storefronts

3-Part Specification

Specifier Guidance – Tecfire USA

This guide section is provided to support design professionals in developing accurate and complete project specifications. Please carefully review and adapt the content to suit your specific project requirements and ensure compliance with all applicable local codes and regulations.

Instructional notes appear in boxed text and should be removed from the final specification. Items marked with brackets and highlighted in yellow indicate options or required selections—please make the appropriate choices and delete any unused text.

Once all editing is complete, remove this page entirely by deleting its content and removing the section break above the following page.

For further assistance, please contact Tecfire USA at 1-833-TECFIRE or info.na@tecfire.com

SECTION 08 41 23
FIRE-RATED ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
Manufacturer: Tecfire

PART 1 - GENERAL

1.1 SUMMARY

1. Fire-resistive glazing and framing assemblies intended for installation in the following applications, as applicable: [vision panels in fire-rated doors,] [full-lite fire-rated doors,] [sidelites,] [borrowed lites,] [windows,] [transoms,] or [glazed wall segments] in both [interior] and/or [exterior] settings.

RELATED SECTIONS:

1. Section 05 12 00 - Structural Steel Framing: Structural support components.
2. Section 05 50 00 - Metal Fabrications: Anchoring elements, including inserts and fasteners.
3. Section 07 25 00 - Weather Barriers: Interface of system with surrounding air and moisture control layers.
4. Section 07 62 00 - Sheet Metal Flashing and Trim: Flashing between this scope and adjacent construction.
5. Section 07 84 00 - Firestopping: Joint protection at connections with other rated assemblies.
6. Section 08 11 13 - Hollow Metal Doors and Frames: Door leaves prepared to accept glazing.
7. Section 08 71 00 - Door Hardware: Hardware not furnished as part of this specification.
8. Section 08 71 13 - Automatic Door Operators: ADA-compliant actuators and control systems.
9. Section 08 11 16: Aluminum Doors and Frames
10. Section 08 12 16.13: Fire-Rated Aluminum Frames
11. Section 08 41 13.13: Fire-Rated Aluminum Framed Entrances and Storefronts
12. Section 08 43 13.13: Fire-Rated Aluminum Storefronts
13. Section 08 88 17: Fire-Rated Glass & Framing

1.2 REFERENCES

Adjust lists below to suit Project. Specifically this means to delete the types of finish that are not used AAMA 2603 thru 2605 and if the system is used in interior applications all the air and water infiltration testing and standards may be removed.

A. American Architectural Manufacturers Association (AAMA)
   1. AAMA 501.1-2005: Standard Test Method for Water Penetration of Windows, Curtain Walls, and Doors Using Dynamic Pressure
   2. AAMA 501.2-2003: Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
   3. AAMA 501.5-2005: Test Method for Thermal Cycling of Exterior Walls
   4. AAMA 1503-1998: Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
   5. AAMA 2603-2002 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   6. AAMA 2604-2005 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
   7. AAMA 2605-2005 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. American Society for Testing and Materials (ASTM):
   1. Fire safety related:
      a. ASTM E119: Methods for Fire Tests of Building Construction and Materials.
   2. 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; 2007.
      b. ASTM A 1011/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; 2006b.

   3. Exterior related
      a. ASTM E 283-04: Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen
      b. ASTM E 330-02: Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference Procedure A

c. ASTM E 331-04: Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
d. ASTM E 783-02: Test Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors
e. ASTM E 1105-00: Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference

4. Sound related:
   a. ASTM E 90-04: Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
   b. ASTM E 413-04: Standard Classification for Rating Sound Insulation

C. American Welding Society (AWS)

1. AWS D1.3 - Structural Welding Code - Sheet Steel; 2007

D. Builders Hardware Manufacturers Association, Inc
1. BHMA A156 - American National Standards for door hardware; 2006 (ANSI/BHMA A156).

E. Canadian Standards
1. CAN/ULC-S101 Standard Test of Fire Endurance Tests of Building Construction and Materials
2. CAN/ULC-S104 Standard Method of Fire Tests of Door Assemblies
3. CAN/ULC-S106 Standard Method of Fire Tests of Window and Glass Block Assemblies

F. National Fire Protection Association (NFPA):
1. NFPA 80: Standard for Fire Doors and Windows.
2. NFPA 251: Standard of Methods of Fire Tests of Building Construction & Materials
3. NFPA 252: Standard of Methods of Fire Tests of Door Assemblies
4. NFPA 257: Standard for Fire Test of Window Assemblies

G. Underwriters Laboratories, Inc. (UL):
1. UL 9: Fire Tests of Window Assemblies
2. UL 10 B: Fire Tests of Door Assemblies
3. UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies
4. UL 263: Fire tests of Building Construction and Materials

H. American National Standards Institute (ANSI):
1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings

I. Consumer Product Safety Commission (CPSC):
1. CPSC 16 CFR 120: Safety Standard for Architectural Glazing Materials

J. American Society of Civil Engineers (ASCE)
   1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures; 2005

K. New York City approval
   1. MEA# 242-00-M

DEFINITIONS:

- Manufacturer: Entity that produces glazing or framing components to be provided.

SUBMITTALS:

- Conform to Section <Insert Section #> for all submissions.
- Product literature including current data sheets, UL listings, and installation instructions.
- Shop drawings indicating configurations, dimensions, tolerances, and structural anchorage.
- Hardware schedule detailing furnished hardware, including cylinder size per Section 08 71 00.
- Optional samples of glass, framing, and finish confirmation.
- Glazing schedule matching the architectural drawing designations.
- Manufacturer warranty documentation.
- Certificate of compliance verifying product adherence to specified standards, or labeled materials backed by a qualified third-party program.

QUALITY ASSURANCE:

- Testing Labs: Accredited under IAS Type A (Inspection) and Building Materials Testing Programs.
- Assemblies tested per
    - ASTM E119
    - CPSC 16 CFR 1201
    - NFPA 251/252/257
    - UL 9/10B/10C/263/752
    - BS 476 Part 22
    - EN 1634-1
    - CAN/ULC S101/S104/S106

- Installers: Experienced with similar systems, with a successful track record. Use glaziers certified as Level 2 or 3 per NGA requirements.
- Source Consistency: Use same manufacturer for each category of accessory and installation method.
- Fire-rated assemblies must be UL-labeled and factory-fabricated; field assembly not permitted.
- Maintain compliance with ADA/ANSI A117.1/FED-STD-795 standards for accessible hardware and operation force.
- NFPA 101 & IBC Chapter 10: Confirm egress hardware requirements for force limits and ease of use.

DELIVERY, STORAGE, HANDLING:

- As recommended by the manufacturer.

PROJECT CONDITIONS:

- Take field measurements prior to fabrication, or coordinate projected dimensions as needed. Identify method used on shop drawings.
- Coordinate scope with surrounding construction and other trades.

WARRANTY:

- Provide Tecfire standard 10-year manufacturer warranty for FireGuard Pro Series.

PART 2 - PRODUCTS

Adjust options in Article below to suit Project.

2.1 MANUFACTURERS - FIRE RATED [DOOR ASSEMBLY] [WINDOW] [WALL ASSEMBLY]

A. Manufacturer Glazing Material: "T-Flame" fire-rated glazing as manufactured by Tecfire USA, Inc. 8414 Zionsville Rd. Indianapolis, IN. 46268 phone (833-TECFIRE) e-mail info.na@tecfire.com web site www.tecfire.com

B. Frame System: "FireGuard Pro As85" fire-rated [aluminum] frame system Tecfire USA, Inc. 8414 Zionsville Rd. Indianapolis, IN. 46268 phone (833-TECFIRE) e-mail info.na@tecfire.com web site www.tecfire.com

C. Frame System: Substitutions for Glazing Material and Frame System not permitted.

2.2 PERFORMANCE REQUIREMENTS

A. Fire Rating Requirements
   1. Duration -- Doors: Capable of providing a fire rating for [45] [60] [90] minutes.
   2. Duration-- Windows: Capable of providing a fire rating for [60] [90] [120] minutes.
   3. Duration-- Walls: Capable of providing a fire rating for [60], [90], [120] minutes

B. Design Requirements
   1. Dimensions – Door and Framing:
      a. Door framing face dimension: 2-3/16-inch.
      b. Depth of door framing: 2-9/16-inch.
      c. Door style face dimension: 3-/11/16-inch.
      d. Door cross rail (if applicable) face: 4-1/8-inch.
      e. Depth of stile, header, sill and cross rail: 2-3/16-inch
   2. Dimensions -- Window Assembly:
      a. Perimeter framing face dimension: 3-1/8-inch at head, sill and jamb.
      b. Horizontal and/or vertical mullions: 4-1/8-inch on the face.
      c. Depth of perimeter and mullion: depth varies based on rating and profile
   3. Construction: Narrow-profile, roll-formed steel architectural grade specialty fire doors. Conventional break-shape type hollow metal steel fire-rated doors will not be considered an acceptable substitute for the FireGuard Pro AS85 Series doors specified in this section as they do not conform to the project design intent and/or aesthetic and quality standards.
      a. Knock down frames are not permitted.

ASTM E330 procedure A is a test method that describes the determination of the structural performance of exterior windows, doors, skylights, and curtain walls under uniform static air pressure differences, using a test chamber. The test is intended only for evaluating the structural performance associated with the specified test specimen and not the structural performance of adjacent construction.

Member deflection is referenced from the IBC Section 24 General Requirements for Glass, article 2403.3.

C. Structural Performance
   1. 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.
   2. Positive wind load: [_____lbf/sq ft.][as indicated on the drawings]
   3. Negative wind Load:[_____lbf/sq ft.][as indicated on the drawings]
   4. Member deflection: Limit deflection of the edge of the glass normal to the plane of the glass to [flexure limit of glass][1/175 of the glass edge length or ¾ inch, whichever is less][of any framing member
   5. Accommodate movement between storefront and adjoining systems

Coordinate the lbf/sq ft with those required in the field test at the end of the section.

D. Air infiltration: Provide systems that allow a maximum air leakage through fixed glazed openings of 0.06 cfm/sq. ft. of area when tested per ASTM E 283 at a static air differential of [1.57] [6.24] lbf/sq ft

Coordinate the lbf/sq ft with those required in the field test at the end of the section.

E. Water Penetration
   1. Under Static pressure, provide systems that do not show uncontrolled water leakage when tested according to ASTM E 331 under static pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
   2. Under Dynamic pressure, provide systems that do not show uncontrolled water leakage when tested according to AAMA 501.1 under static pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

Coordinate the level of bullet resistance with the type of glazing selected in Part 2 of this specification.

2.3 MATERIALS - GLASS

A. Low-E Coated glass for use in insulated exterior units See Section 08 80 00

Use the paragraph above to specify the low-e coated glass in Section 08 80 00 and use the paragraph below to select glass available from Technical Glass Products. Other manufacturer's glass will need to be shipped to Technical Glass Products for incorporation into insulated unit.

Not all low-e coated glass by all manufacturers is available for assembly by others into insulated units. Consult with low-e glass manufacturer about availability of their low-e product for shipment to Technical Glass Products for inclusion into insulated units.

B. Fire Rated Glazing: Composed of Tecfire T-Flame or AGC glass distributed by Tecfire

C. Impact Safety Resistance: ANSI Z97.1

Adjust list of properties below to suit Project -- these are listed in tabular form delete those columns not used.

D. Exterior Grade: PVB inner layer installed towards the exterior.

E. Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacture, testing laboratory (Intertek), fire rating period, safety glazing standards, and date of manufacture.

F. Glazing Accessories: Manufacturer's standard compression gaskets, spacers, setting blocks and other accessories necessary for complete installation.

2.4 MATERIALS – ALUMINUM FRAMES AND ALUMINUM DOORS

A. Frame Construction: Adjust list of minutes below to suit Project.

A. Aluminum Framing System structure and glazing stops [45 min.] [60 min.] [90 min] [120 min] from an extruded and thermally broken profile filled internally with cement composite material

1. Provide fire, smoke, and thermal resistance from both sides by insulating the interior of the profiles with a proprietary core layer. Seal perimeter gaps between framing and rough openings with mineral wool firestop insulation or tested intumescent sealant.
2. Use manufacturer-supplied glazing beads designed to maintain secure engagement with approved glazing.
3. Employ manufacturer-recommended mechanical fasteners.
4. Install T-Flame glazing (by Tecfire) using appropriate calcium silicate or neoprene setting blocks.
5. Use only EPDM glazing gaskets in combination with [closed cell PVC tape] or [approved structural silicone] for T-Flame (or AGC) glazing installation.

ALUMINUM DOOR SYSTEM [45 MIN.] [60 MIN.] [90 MIN.]:

1. Doors shall be manufacturer's standard [single-leaf] or [pair] configurations complete with standard hardware sets.
2. Coordinate locking cylinder requirements with Section 08 71 00 – Door Hardware.

FABRICATION: A. Exterior frame assemblies shall be factory welded where practical.

1. Segment frames in the field only when necessary due to shipping limitations or access constraints.
2. Provide suitable joining hardware at all splices.
3. Knock-down perimeter door frames are not acceptable. B. Interior frame assemblies may be supplied knock-down or factory welded upon request.
4. Splice large frames only where required due to fabrication, delivery, or access limitations.
5. Provide securement hardware suitable for field assembly.
6. Knock-down perimeter door frames are not acceptable.

B. Field glaze door and frame assemblies.

C. Factory prepares steel door assemblies and installs all hardware.

D. Fabrication Dimensions: Fabricate fire rated assembly to field dimensions.

E. Obtain approved Shop Drawings prior to fabrication.

2.5 FINISHES, GENERAL

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.
3. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class II, Color Anodic Finish: AA-M12C22A32/A34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.
5. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.
6. Color: [Light bronze] [Medium bronze] [Dark bronze] [Black].
7. Color: [Match Architect's sample] [As selected by Architect from full range of industry colors and color densities].
8. High-Performance Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA [**2604**] [**2605**] and with coating and resin manufacturers' written instructions.
9. High-Performance Organic Finish (3-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.

2.6 POWDERCOAT FINISHES

Powder coat finish systems offered and provided by Tecfire. If used exteriorly contact your Tecfire Representative for alternative finishes that provide an even higher standard of protection.

A. Finish after fabrication.

B. Finish: Factory-applied powder coat finish per AAMA 2603 minimum, 1.5 mils dry film thickness.
   1. Color: As selected from Tecfire's standard range.
   2. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.7 DOOR HARDWARE FOR SINGLE AND PAIRED DOORS

A. Furnish hardware with [45], [60], [90] minute fire door by the manufacturer. Select hardware from door manufacturer's standard recommended and approved hardware groups as specified in Division 8 Section "Door Hardware".
   1. All hardware BHMA Certified

B. Provide power assisted hardware for use at any door that cannot meet the opening force(s) required by code noted in Part I above.

- High energy, power-operated doors must meet the requirements of ANSI/BHMA A156.10 and power-assisted low energy doors must comply with ANSI/BHMA 156.19

- The following two hardware sets are supplied by the manufacturer and are provided here for coordination with other hardware products specified for other openings. Please contact the product representative for other options. As the doors and frames are tested as an assembly substitutions in hardware must not be allowed.

Operating hardware for FireGuard Pro AS85 Series **Single Inswing Doors with Mortise Locking**. * FINISH LEGEND:

PTM Painted to match frame

MA Mill Finish Aluminum

689 Aluminum Paint

630 Satin Stainless Steel

626 Satin Chrome Plated

ACCESSORY MATERIALS

Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for **[30-mil]** **[0.762-mm]** thickness per coat.

7. EXECUTION

A. EXAMINATION

1. Examine substrates and members to which the work of this section attaches or adjoins prior to frame installation.

2. Provide openings plumb, square and within allowable tolerances.
    1. The manufacturer recommends 3/8 inch shim space at all walls

3. Notify Architect of any conditions which jeopardize the integrity of the proposed fire wall / door system.

4. Do not proceed until such conditions are corrected.

B. INSTALLATION

1. See FireGuard Pro AS85 Series Installation Manual

C. REPAIR AND TOUCH UP

1. Limited to minor repair of small scratches. Use only manufacturer's recommended products.
    1. Such repairs shall match original finish for quality or material and view.

2. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

D. ADJUSTING

1. Adjust door function and hardware for smooth operation. Coordinate with other hardware suppliers for function and use of any other attached hardware.

E. PROTECTION AND CLEANING

1. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
2. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
3. Do not use any of the following:
    1. Steam jets
    2. Abrasives
    3. Strong acidic or alkaline detergents, or surface-reactive agents
    4. Detergents not recommended in writing by the manufacturer
    5. Do not use any detergent above 77 degrees F
    6. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
    7. Metal or hard parts of cleaning equipment must not touch the glass surface

4. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

5.Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

