

Tiger Door Extreme Duty Fire Rated Doors and Frames Specification

SECTION 08 16 13

FIBERGLASS DOORS & FRAMES

PART 1 - GENERAL

1.01 SCOPE AND DEFINITIONS

- A. Furnish and install doors, frames of FRP composite construction in accordance with details and schedule shown on the project drawings and as specified herein. Door and frame products of aluminum, steel or wood constructions that use FRP face sheets are strictly excluded.
- B. FRP is defined as "Fiberglass Reinforced Polyester"

1.2. RELATED SECTIONS

- A. Section 04 00 00: Masonry mortar
- B. Section 05 50 00: Steel lintels
- C. Section 06 20 00: Finish Carpentry
- D. Section 08 14 00: Wood Doors
- E. Section 08 70 00: Hardware
- F. Section 08 80 00: Glazing

1.03 QUALITY ASSURANCE

- A. Referenced Standards
 - 1. American Society for Testing and Materials (ASTM)
 - 2. Society of Automotive Engineers (SAE)
 - 3. International Building Code, Plastics (Chapter 26)
 - 4. UL 10b and UL 10c, NFPA 252 and UBC7-2
- B. Experience: Manufacturer shall be ISO 9001 certified and been engaged in the manufacture of FRP door and frame systems for a minimum of five (5) years documented experience prior to the start of this work, and who has a history of successful production acceptable to the Architect.
- C. Referenced Standard: Where labeled fire doors are required, Fiberglass Doors and frames shall be UL listed and shall be tested successfully to UL10B / UL10C, UBC 7-2 standards.
- D. Process: Certify that FRP doors are manufactured via press-molding technology.
- E. Warranty: Provide written limited guarantee for FRP doors and frames as follows:

1. Fiberglass Fire Doors are guaranteed for 10 years against delamination due to corrosion from the specific chemical environment named at the time of purchase. Furthermore, all products are inspected prior to shipment and guaranteed against defective workmanship for a period of ten (10) calendar years after the date of purchase.

1.04 SUBMITTALS

- A. Product Data: Provide catalog cut of FRP door detailing internal construction and reinforcements, materials used and description of molding process.
- B. Shop Drawings: To include the following specific information:
 1. Specifications relating to FRP door thickness, resin type, core material, method of construction, finish color, type of glass and glazing, anchor systems, joint construction and complete warranty information.
 2. Complete schedules or drawings of FRP doors and frames (and associated Builders Hardware) showing identifying mark numbers, door and frame types, typical elevations, nominal sizes, handing, actual dimensions and clearances, and required hardware preps and reinforcements.
 3. Supporting reference drawings pertaining to frame mounting details, door light or louver installation, hardware locations, and factory hardware cutouts and reinforcements.
- C. Color Samples: Provide a complete set of available finish colors from the manufacturer for color selection upon request.
- D. Installation instructions: Include manufacturer's specific information describing procedures, sequence and required fasteners for frame and door installation.
- E. Production of FRP doors and frames shall not proceed until final approval of submittals and all necessary manufacturing information is received from customer.

1.05 DELIVERY, STORAGE AND HANDLING

- A. FRP doors and frames are to be delivered to jobsite in adequate crating with foam sheet separations between all components.
- B. Upon receipt of shipment, remove and inspect the doors and frames for damage. Note any damage on the shipping papers prior to accepting. If there is any noted (visible or concealed) damage, notify Tiger Door at 1-888-891-4416 immediately.
- C. Handling and storage of the doors and frames after receipt is the responsibility/liability of the customer. It is recommended that the doors be stored indoors in a vertical position, clear of the floor, with blocking between the doors to permit air circulation between the doors and prevent damage to the door faces. Rain/water or condensation must not be allowed to collect or lay between stored doors. Do not wrap in plastic sheeting as it will promote condensation formation within. Permanent discoloration can result. Failure to comply with the receiving and reporting instructions shall void the Tiger Door warranty.
- D. Use care in handling FRP doors and frames to prevent damage to factory finishes. Wear protective gloves and do not slide or drag doors or frames against one another.

PART 2 - PRODUCTS

2.01 Manufacturer

- A. FRP Doors and Frames shall be as manufactured by Tiger Door, 1181 Garden Street Greensburg, PA 15601. ph 724-832-4416 toll-free 888-891-4416, fax 724-837 3759- www.tigerdoor.com.

2.02 FRP DOORS

A. Fire Rated FRP Doors:

1. Design: FRP doors shall be of seamless press-molded construction. Laminated FRP face sheets shall be applied while wet and uncured to an internal door stile and rail subframe/core assembly and then press-molded under heat and pressure. The composite door panel must be integrally fused over its entire surface area, not just adhesive-bonded at perimeter stiles and rails. Doors shall remain under pressure during curing for flat, warp-free surfaces.
2. Core: For maximum rigidity and compressive strength a fire resistant mineral core shall be used. Molding pressure and resin gel time shall be sufficient to allow for penetration of resin into the cellular structure of the core to maximize shear and peel strengths at the skin/core interface and reduce the possibility of delamination. The mineral core is to be completely enclosed within the intumescent and FRP laminated edge perimeter.
3. Intumescent: Only Category A type door construction is permitted. All intumescents shall be molded into the door structure with a minimum of 1/8" thick perimeter FRP edge banding (prior to machining). Category B type door construction, with post applied and/or exposed edge intumescent components or products are not acceptable.
4. Faces: Door facings shall be 0.120" composite FRP sheet exterior grade, fiber reinforced plastic panel on interior and exterior faces. Colored pigment shall be maximum amount formulated with the resin. FRP face sheets shall be USDA acceptable, non-porous, with a maximum flame spread rating of 200, and smoke generated maximum of 450 degrees meeting Class C requirements per ASTM E84.
5. 5. Finish: The exposed FRP door faces shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Coating shall have a minimum hardness of H to 2H. Finish shall be a slightly textured semi-gloss to minimize the visual effects of wear and tear.
6. Astragals: Provide a heavy pultruded FRP angle astragal on the meeting stile edge of each inactive leaf of double door pairs.
7. Lights: Provision for door lights shall be performed during manufacture and shall not be attempted in the field. Cutouts are to be totally enclosed by internal high density fire resistant mineral core composite blocks incorporated into door subframe prior to press-molding and machining, the opening is completely fused to both door skins. Vision frames shall be a commercially available UL fire rated kit. Maximum glass size shall not exceed 1296 in² for up to a 90 minute application.
8. Louvers: Provision for door louvers shall be performed during manufacture and shall not be attempted in the field. Cutouts are to be totally enclosed by internal high density fire resistant mineral core composite blocks incorporated into door subframe prior to press-molding and machining, the opening is completely fused to both door skins. Door louvers shall be a commercially available UL fire rated kit. Maximum louver size shall not exceed 24" x 24" for up to a 90 minute application.
9. Size limitations: The maximum double door jamb opening size shall not exceed nominal 8' - 0" x 8' - 0" with a Maximum single door panel size not to exceed nominal 4' - 0" x 8' - 0".

2.03 FRP FRAMES

A. Fire Rated Frames:

1. Design: Fire rated FRP Door frames furnished under this specification shall utilize a high-modulus pultruded structural FRP shape. Standard frame profile is a double rabbeted 5¾" depth x 2" face, 3/16"

thick, with integral 5/8" doorstop. The minimum frame section shall be limited to a 4" jamb depth, 1" face. Four inch header and expanded profiles are acceptable. Frame cavities shall be filled with a proprietary fire resistant composite formulation. Hollow metal or Stainless Steel frames are not acceptable.

2. Intumescent: All intumescent material shall be internal to the door structure. Post applied or exposed intumescent components or products are not acceptable
3. Corner Joints: Jambs and header shall be joined at corners via miter connections with hidden stainless steel flat head screws. Corner screws shall not be visible on interior or exterior frame faces.
4. Anchors:
 - a. BOLT-IN: Provide manufacturer's required number of 3/8" diameter x 4" long flat head stainless steel sleeve anchors for masonry openings, 3/8" diameter x 4" machine screw with nut and washers for structural steel openings, #14 x 4" stainless steel flat head sheet metal screws for wood or steel stud openings. Include extra anchors for additional frame height in two foot increments above 8'-0". Provide single bolt anchor at center of all headers over four feet in nominal width. Stainless Steel fasteners shall be furnished by the factory.
 - b. GROUT-IN: Provide manufacturer's required number of wire or strap type masonry anchors for installation into block wall. Fill frame cavity with grout.
5. Finish: Frames shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Industrial urethane chemical coating color topcoat, to match the color and sheen of the doors, for superior weatherability. Gelcoat may not be sprayed onto the frame as a secondary coating.

2.05.1 MECHANICAL PROPERTIES AND TEST PERFORMANCE

- A. Pultruded structural shapes for edges, frames, and astragals shall exhibit the following minimum longitudinal coupon properties (per ASTM):
 1. Tensile strength (D638) 30,000 psi
 2. Compressive strength (D695) 30,000 psi
 3. Flexural strength (D790) 30,000 psi
 4. Flexural modulus (D790) 1,600,000 psi
 5. Shear strength (D2846) 4,500 psi
 6. Impact, notched (D256) 25 ft-lb/in
 7. Barcol hardness (D2853) 50
- B. Core material shall exhibit the following minimum properties:
 1. Core material must comply with the International Building Code (IBC) chapter 26 requirements for use with a plastic skin.
 2. Core material must be asbestos free incombustible mineral composition.
- C. Core banding material shall exhibit the following minimum coupon properties (per ASTM):
 3. Core banding material must comply with the International Building Code (IBC) chapter 26 requirements for use with a plastic skin.
 4. Modulus of Rupture (C133) 1700 psi
 5. Compressive Strength (C109-93) 2800 psi
 6. Thermal Conductivity 946 F (C182) 1.38 (BTU-in/hr-ft²-F)
 7. Thermal Conductivity 1632 F (C182) 1.39 (BTU-in/hr-ft²-F)
 8. Shrinkage average % (C356) at 1200 F 24 hours -4.7%
 9. Screw Holding 1100 lbs
 10. Electrical Resistivity from ambient to 1148 F (D257) 3.40 E+10 ohm-cm
 11. Heat Transfer for unexposed surface rise above ambient 90 minute, 1772 F (E 152) 196 F
 12. Density minimum 60 lb/ft³
 13. Core banding material must be asbestos free incombustible mineral composition.
- D. Adhesive for bonding pultrusions shall exhibit the following minimum coupon properties (per SAE)

1. Tensile Strength (D882-83A modified) minimum 2000 psi
 2. 8 day 25° C at 100% humidity Cross Peel (SAE J1553) minimum 330 psi
 3. 7 day immersion in seawater Cross Peel (SAE J1553) minimum 330 psi
 4. 30 day immersion in saltwater Cross Peel (SAE J1553) minimum 330 psi
 5. 72 hour immersion in gasoline Cross Peel (SAE J1553) minimum 330 psi
 6. 72 hour immersion in 20% sulfuric acid Cross Peel (SAE J1553) minimum 300 psi
- E. UL 10b, UL 10c / UBC7-2 positive pressure – Doors and Frames
1. Singles and pairs, with component listings for both FRP doors and FRP frames
- F. UL 9, – Fixed Sash
2. Listing for Fiberglass fixed sash with FRP glazing stop.

2.04.1 FASTENERS

- A. All fasteners for all hardware shall be type 304 CRSS (18-8 series corrosion resistant stainless steel). No carbon steel or aluminum components shall be used.

2.04.2 HARDWARE

- A. Doors shall be factory mortised and drilled for mortise template butt hinges, with #12x2” long stainless steel screws pre-installed for hinge attachment. Provide 161 cylindrical lock bore, rim deadbolt, ANSI 86 mortise lock edge prep and pocket or flush bolt cutouts as required.
- B. Frames shall be factory machined and drilled for all hardware requiring mortises, with #12x1” long stainless steel screws pre-installed for hinge attachment.
- C. Hardware shall be furnished as listed in section 08 70 00 or as so designated in appropriate section, and shall be coordinated by GC and installed by experienced mechanics.
- D. Supplier shall furnish manufacturer’s standard templates, installation instructions, or full size approved door and frame preparation instructions as approved by the architect and as required by door and frame manufacturer prior to door and frame factory initiated manufacture. Standard factory lead-time for production of FRP doors and frames shall commence only and when all distributor required preparation information is received and acknowledged by the door and frame manufacturer.

PART 3 - EXECUTION

3.01 IDENTIFICATION

- A. Factory mark all doors and frames using a chemical resistant plastic tag or indelible marker with identifying number, keyed to shop drawings, prior to shipment.

3.02.1 INSTALLATION

- A. Frames: Install in strict accordance with manufacturer’s printed instructions. Set plumb and square, using shims for bolt-in of existing openings, or wood bracing prior to grouting of jambs. Use at least two 2x6 wood spreaders inside frame to maintain critical opening dimensions during grouting.

- B. Doors: Hang per manufacturer's printed instructions using special screws provided for hinge attachment. Install doors to swing freely and to stand open at any angle. After installation make final adjustments to hardware to allow for proper door operation and latching. All surface applied hardware shall be thru bolted.

3.03 CLEANING

- A. Clean exposed surfaces of FRP doors and frames with a mild, non-abrasive cleaner and water.

END OF SECTION

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