**SECTION 08 17 43**

**AF Series Fire-Rated FRP Doors and Frames**

**PART 1 GENERAL**

1. **SECTION INCLUDES**
	1. AF-220FR Sandstone Texture Fire-Rated Fiberglass Door.
	2. AF-222FR Sandstone Texture Fire-Rated Fiberglass Door installed in Fire-Rated Fiberglass Framing.
	3. AF-220FR Sandstone Texture Fire-Rated Fiberglass Door installed in Fire-Rated Metal Framing.
2. **RELATED SECTIONS**
	1. Section 04 00 00 – Masonry Mortar.
	2. Section 05 50 00 – Metal Fabrications.
	3. Section 08 01 17 – Operation and Maintenance of Integrated Door Opening Assemblies.
	4. Section 08 06 71 – Door Hardware Schedule.
	5. Section 08 06 80 – Glazing Schedule.
	6. Section 08 10 00 – Doors and Frames.
	7. Section 08 71 00 – Door Hardware.
	8. Section 08 80 00 – Glazing.
3. **REFRENCES**

* 1. [ASTM-D256](#ASTM_D_256) – Standard Test Methods for Determining the Pendulum Impact Resistance of Plastics.
	2. [ASTM-D570](#ASTM_D_570) – Standard Test Method for Water Absorption of Plastics.
	3. [ASTM-D638](#ASTM_D_638) – Standard Test Method for Tensile Properties of Plastics.
	4. [ASTM-D790](#ASTM_D_790) – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
	5. [ASTM-D2583](#ASTM_D_2583) – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
	6. [ASTM D2794](https://www.astm.org/Standards/D2794.htm) – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

* 1. [ASTM-D-4226](#Finishes) – Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products
	2. [ASTM-E84](#ASTM_E_84) – Standard Test Method for Surface Burning Characteristics of Building Materials.

* 1. [ASTM-G-53](#Finishes) - Standard Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials
	2. [CAN / ULC S104](https://www.scc.ca/en/standardsdb/standards/25796) – Standard Method for Fire Tests of Door Assemblies.
	3. [UL 10B](https://standardscatalog.ul.com/standards/en/standard_10B_10) – Standard for Fire Tests of Door Assemblies.
	4. [UL 10C](https://standardscatalog.ul.com/standards/en/standard_10C) – Standard for Positive Pressure Fire Tests of Door Assemblies.
	5. [NFPA 80](https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=80) – Standard for Fire Doors and Other Opening Protectives.
	6. [NFPA 252](https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=252) – Fire Tests of Door Assemblies.
1. **SUBMITTALS**
	1. Must comply with Section 01 33 00 – Submittal Procedures.
	2. Action Submittals/ Informational Submittals.
		1. Product Data.
			1. Submit manufacturer’s product data sheets, catalog pages illustrating the products, description of materials, components, fabrication, finishes, installation instructions, and applicable test reports.
		2. Shop Drawings.
			1. Submit manufacturer’s shop drawings, including elevations, sections, and details indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
		3. Samples.
			1. Submit manufacturer’s door sample composed of door face sheet, core, framing and finish.
			2. Submit manufacturer’s sample of standard colors for door face and frame.
		4. Testing and Evaluation Reports.
			1. Submit testing reports and evaluations provided by manufacturer conducted by and accredited independent testing agency certifying doors and frames comply with specified performance requirements listed in Section 2.01 C.
		5. Manufacturer Reports.
			1. Manufacturer’s Project References.
				1. Submit list of successfully completed projects including project name, location, name of architect, type, and quantity of doors manufactured.
	3. Closeout Submittals.
		1. Operation and Maintenance Manual.
			1. Submit manufacturer’s maintenance and cleaning instructions for doors and frames, including maintenance and operating instructions for hardware.
		2. Warranty Documentation.
			1. Submit manufacturer’s standard warranty.
2. **QUALITY ASSURANCE**
	1. Manufacturer’s Qualifications.
		1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 25 years concurrent successful experience.
		2. Door and frame components must be fabricated by same manufacturer.
		3. Evidence of a documented complaint resolution quality management system.
3. **DELIVERY, STORAGE, AND HANDLING**
	1. Delivery.
		1. Deliver materials to site in manufacturer’s original, unopened, containers and packaging.
		2. Labels clearly identifying opening, door mark, and manufacturer.
	2. Storage.
		1. Store materials in a clean, dry area, indoors in accordance with manufacturer’s instructions.
	3. Handling.
		1. *Protect materials and finish from damage during handling and installation.*
4. **WARRANTY**
	1. Warrant doors, frames, and factory installed hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal weathering.
	2. Standard Period.
		1. Ten years starting on date of shipment.
	3. Limited lifetime
		1. Covers failure of corner joinery, core deterioration, and delamination or bubbling of door skin and corrosion of all-fiberglass products while the door is in its specified application in its original installation.
	4. Finish
		1. SpecLite3® face sheets 10 years from the date of shipment.
		2. Painted AF-220FR: 3 years.
		3. Painted FR frames: 3 years.

**PART 2 PRODUCTS**

1. **FRP/ALUMINUM HYBRID DOORS**
	1. Manufacturer.
		1. Special-Lite, Inc.
			1. PO Box 6, Decatur, Michigan 49045.
			2. Toll Free (800) 821-6531, Phone (269) 423-7068, Fax (800) 423-7610.
			3. Web Site [www.special-lite.com](http://www.special-lite.com).
			4. E-Mail info@special-lite.com.
2. **DESCRIPTION**
	1. AF-220FR Sandstone Texture Fire-Rated Fiberglass Door.
		1. Door Opening Size.
			1. 4’0” x 8’0” maximum size single swing.
			2. 8’0” x 8’0” maximum size standard pairs.
			3. Click or tap here to enter text.
		2. Construction.
			1. Door Thickness.
				1. 1-3/4”.
			2. Stiles.
				1. Single Swing.

Hinge and lock stile, 2” minimum tectonite with Palusol P-100 Intumescent and 0.090” thick fiberglass edge painted to match door face.

* + - * 1. Standard Pairs.

Hinge stile, 2” minimum tectonite with Palusol P-100 Intumescent and 0.090” thick fiberglass edge painted to match door face.

Meeting edge, 3” minimum with Palusol P-100 Intumescent and 0.090” thick fiberglass edge painted to match door face.

* + - 1. Rails.
				1. Top rail, 6” minimum tectonite with Palusol P-100 Intumescent and 0.090” thick fiberglass edge painted to match door face.
				2. Bottom rail, 4” minimum for single swing, 4-1/2” minimum for pairs tectonite with 0.090” thick fiberglass edge painted to match door face.
			2. Core.
				1. WSCP-412 proprietary mineral core.
				2. 1-1/2” nominal thickness.
				3. 18 pcf minimum density.
			3. Face Sheet.
				1. 0.120” thick, sandstone texture, through color FRP sheet.
				2. Optional painted finish consult manufacturer.
				3. Bonded to core with adhesive according to manufactures listing.
			4. Cutouts.
				1. Manufacture doors with cutouts for required vision lites per manufactures listing.
			5. Hardware.
				1. Pre-machine doors in accordance with templates from specified hardware manufacturers.
				2. Field apply factory supplied gaskets and seals, full width intumescent and smoke seal required at top of door, smoke seals required on both jambs.
1. **FRAMING**
	1. Framing
		1. FR-Series Framing
			1. Materials.
				1. ¼” thick, solid, pultruded, FRP profiles.
				2. No corrosive components or reinforcements.
				3. Solid tectonite filler.
				4. No steel or aluminum filler is allowed.
			2. Perimeter Frame Members.
				1. Factory fabricated.
				2. Integral 5/8” x 2-1/4” doorstop.
				3. Mitered with 4” x 4” x 3/8” pultruded FRP angle reinforcement with interlocking pultruded FRP brackets.
				4. 5-3/4”, 6-3/4”, 7-3/4”, or 8-3/4” jamb depth.
				5. 2” face on jambs.
				6. 2” or 4” face on header.
				7. Knocked down for field assembly.
			3. Anchors
				1. Factory furnished as specified by drawings.
				2. Drywall tuck available.
		2. Any category C standard frame.
		3. Any category C proprietary frame.
2. **PERFORMANCE**
	1. Face Sheet.
		1. Standard Interior and Exterior Class C 0.120” thick, Sandstone texture, through color FRP sheet.
			1. Flexural Strength, ASTM-D790: 27 x 103 psi.
			2. Flexural Modulus, ASTM-D790: 0.7 x 106 psi.
			3. Tensile Strength, ASTM-D638: 18 x 103 psi.
			4. Tensile Modulus, ASTM-D638: 1.0 x 106 psi.
			5. Barcol Hardness, ASTM-D2583: 40.
			6. Izod Impact, ASTM-D256: 7.0 ft-lb/in.
			7. Gardner Impact Strength, ASTM-D5420: 30 in-lb.
			8. Water Absorption, ASTM-D570: 0.16%/24hrs at 77°F.
			9. Surface Burning, ASTM-E84: Flame Spread ≤ 200, Smoke Developed ≤ 450.
			10. Chemical Resistance.
				1. Excellent Rating.

Acetic Acid, Concentrated.

Acetic Acid, 5%.

Bleach Solution.

Detergent Solution.

Distilled Water.

Ethyl Acetate.

Formaldehyde.

Heptane.

Hydrochloric Acid, 10%.

Hydrogen Peroxide, 3%.

Isooctane.

Lactic Acid, 10%.

* + - 1. USDA/FSIS Requirements.
				1. FRP face sheet with surfaseal is a finished outer surface material that is rigid; durable; non-toxic; non-corrosive; moisture resistant; a light, solid color such as white; easily inspected; smooth or an easily cleaned texture.
				2. FRP face sheet with surfaseal does not contain any known carcinogen, mutagen, or teratogen classified as hazardous substances; heavy metals or toxic substances; antimicrobials; pesticides or substances with pesticidal characteristics.
	1. Door Assembly.
		1. 60 min pp category A door.
		2. 90 min pp category B door.
		3. 90 min pp category A door.
		4. Temperature rise @ 30 min, 250 °F when vision lites do not exceed 100 in².
		5. Temperature rise @ 60 min, 450 °F max.
1. **MATERIALS**
	1. Fiberglass.
		1. See 2.02.A.2.e.
		2. See 2.02.B.2.e.
		3. See 2.02.C.2.e
	2. Fasteners.
		1. All exposed fasteners will have a finish to match material being fastened.
		2. 410 stainless steel or other non-corrosive metal.
		3. Must be compatible with items being fastened.
2. **FABRICATION**
	1. Factory Assembly.
		1. Door and frame components from the same manufacturer.
		2. Required size for door and frame units, shall be as indicated on the drawings.
		3. Maintain continuity of line and accurate relation of planes and angles.
		4. Secure attachments and support at mechanical joints with hairline fit at contact surfaces.
	2. Shop Fabrication
		1. All shop fabrication to be completed in accordance with manufactures process work instructions.
		2. Quality control to be performed before leaving each department.
3. **FINISHES**
	1. Door.
		1. FRP Face Sheets
			1. Through color.
				1. [Color.](http://special-lite.com/wordpress/wp-content/uploads/files/Categories/Doors/Fiberglass%20Doors/All%20Fiber/Literature/sandstone_texture_color_chart.pdf)

Choose an item.

* 1. Door Paint
		1. Two-component flexible acrylic urethane Satin topcoat. (STANDARD)
			1. [Color.](https://special-lite.com/news/paint-color-change/)
				1. Choose an item.
			2. Custom colors available consult manufacturer.
			3. Excellent exterior durability.
			4. Unique, high-solids, high-build, multifunctional coating.
			5. Low VOC, Satin coating.
			6. Impact Resistance, ASTM D-4226 Minimum 1.2 in/lb/mil
			7. Color retention: ≤1Δ (CIE L.a.b.), Montreal 45° South: 12 months
			8. Very good chemical resistance.
		2. Two-component acrylic urethane enamel Gloss topcoat. (OPTIONAL)
			1. [Color.](https://special-lite.com/news/paint-color-change/)
			2. Custom colors available consult manufacturer.
			3. Unique, high-solids, high-build, multifunctional coating.
			4. Low VOC, Gloss coating.
			5. Impact Resistance, ASTM-D2794: 80-102 in/lb (direct), 40-80 in/lb (reverse) @ 1.5 mils thickness.
			6. Color retention: Δ E < 5 (CIE L.a.b.), Florida Exposure: 18 months
			7. Excellent chemical resistance.
	2. Frame
		1. Fiberglass.
		2. Two-component flexible acrylic urethane Satin topcoat. (STANDARD)
			1. [Color.](https://special-lite.com/news/paint-color-change/)
				1. Choose an item.
			2. Custom colors available consult manufacturer.
			3. Excellent exterior durability.
			4. Unique, high-solids, high-build, multifunctional coating.
			5. Low VOC, Satin coating.
			6. Impact Resistance, ASTM D-4226 Minimum 1.2 in/lb/mil
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			2. Custom colors available consult manufacturer.
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			6. Color retention: Δ E < 5 (CIE L.a.b.), Florida Exposure: 18 months
			7. Excellent chemical resistance.
1. **ACCESSORIES**
	1. Vision Lites.
		1. Factory Glazing.
		2. Stainless Steel vison kit with 3/16” NGP Firelite NT, clear.
		3. Size as indicated on the drawings.
		4. 60 to 90-minute rated doors.
			1. Maximum 704 in² in listed and labeled kit for positive pressure applications using listed glazing. Minimum 5” from top or edge of door to lite cutout and minimum 5” from latch cutout to lite cutout.
			2. Maximum 32” high.
			3. Maximum 22” wide.
			4. Multiple lights are allowed when the sum of the areas does not exceed the tested area with the maximum length and width limitations.
		5. 20 to 45-minute rate doors.
			1. Listed metal vison frames and listed glazing are limited to a maximum clear view area of 616 in² per lite with a maximum of 1232 in². Lite kits exceeding 100 in² void the temperature requirements per NFPA 80 unless temperature resistive glazing is used.
	2. Louvers.
		1. Listed and labeled louvers.
		2. Maximum 100 in².
		3. Must be below 40” from bottom of door.
	3. Hardware.
		1. All hardware must be listed and labeled for use in mineral core fire doors.
		2. Pre-machine doors in accordance with templates from specified hardware manufactures and hardware schedule.
		3. Factory install hardware.
		4. EPT Units
			1. Allowed between top and middle hinge locations.
			2. 1/16” maximum clearance per side when installing EPT.
			3. Limited to maximum 60 min positive and neutral pressure applications.
			4. Intumescent caulk or strips are required on bottom, top, and side of EPT device.
		5. Hardware Schedule.
			1. Choose an item.
				1. Hinges Per NFPA 80, Table 6.4.3.1.

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* + - * 1. Locking Hardware

Single point latching on singles, 3-point latching for pairs.

Must be listed for use with mineral-core fire doors.

3-point latching for 90 min and lower pairs with rated astragal.

Surface vertical rod less bottom rod allowed on 45-min and lower pairs and singles with door to door or door to floor fire pin installed in each leaf.

Rim x Rim with listed mullion allowed for 90-min pairs.

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* + - * 1. Surface Bolts.

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* + - * 1. Protection plates.

Brass, bronze, steel, aluminum, polycarbonate or decorative laminate maximum 12 from bottom rail.

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* + - * 1. Astragal

Optional wood astragal.

* 1. Wire Raceway
		1. Single swing applications only.
		2. 3/8” x 3/8” bore.
		3. Maximum height of 40” from bottom edge of door.

**PART 3 EXECUTION**

1. **EXAMINATION**
	1. Examine areas to receive doors.
	2. Notify architect of conditions that would adversely affect installation or subsequent use.
	3. Do no proceed with installation until unsatisfactory conditions are corrected.
2. **PREPARATION**
	1. Ensure openings to receive frames are plumb, level, square, and in tolerance.
3. **ERECTION**
	1. Install doors in accordance with manufacturer’s instructions.
	2. Install doors plumb, level, square, true to line, and without warp or rack.
	3. Anchor frames securely in place.
	4. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by architect.
	5. Set thresholds in bed of mastic and back seal.
	6. Install exterior doors to be weathertight in closed position.
	7. Repair minor damages to finish in accordance with manufacturer’s instructions and as approved by architect.
	8. Remove and replace damaged components that cannot be successfully repaired as determined by architect.
4. **FIELD QUALITY CONTROL**
	1. Manufacture’s Field Services.
		1. Manufacturer’s representative shall provide technical assistance and guidance for installation of doors.
5. **ADJUSTING**
	1. Adjust doors, hinges, and locksets for smooth operation without binding.
6. **CLEANING**
	1. Clean doors promptly after installation in accordance with manufacturer’s instructions.
	2. Do not use harsh cleaning materials or methods that would damage finish.
7. **PROTECTION**
	1. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

**END OF SECTION**