**SECTION 08 17 43**

**COMPOSITE FIBERGLASS DOOR**

**PART 1 GENERAL**

1. **SECTION INCLUDES**
	1. AF-217BR³ Pebble Grain Composite Fiberglass Ballistic Door.
	2. AF-217BR³ Pebble Grain Composite Fiberglass Ballistic Door installed in AF-150BR³ Pultruded Fiberglass Ballistic Framing.
2. **RELATED SECTIONS**
	1. Section 08 01 17 – Operation and Maintenance of Integrated Door Opening Assemblies.
	2. Section 08 06 71 – Door Hardware Schedule.
	3. Section 08 06 80 – Glazing Schedule.
	4. Section 08 10 00 – Doors and Frames.
	5. Section 08 12 16 – Aluminum Frames.
	6. Section 08 42 13 – Aluminum-Framed Entrances.
	7. Section 08 71 00 – Door Hardware.
	8. Section 08 91 26 – Door Louvers.
3. **REFRENCES**

* 1. [ASTM-D256](#ASTM_D_256) – Standard Test Methods for Determining the Pendulum Impact Resistance of Plastics.
	2. [ASTM-D-4226](#Finishes) – Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products
	3. [ASTM-D570](#ASTM_D_570) – Standard Test Method for Water Absorption of Plastics.
	4. [ASTM-D638](#ASTM_D_638) – Standard Test Method for Tensile Properties of Plastics.
	5. [ASTM-D695](https://www.astm.org/Standards/D695.htm) – Standard Test Method for Compression Properties of Rigid Plastics.
	6. [ASTM-D696](https://www.astm.org/Standards/D696.htm) – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 °C and 30 °C with a Vitreous Silica Dilatometer.
	7. [ASTM-D790](#ASTM_D_790) – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
	8. [ASTM-D792](https://www.astm.org/Standards/D792.htm) – Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
	9. [ASTM-D1761](https://www.astm.org/Standards/D1761.htm) – Standard Test Methods for Mechanical Fasteners in Wood.
	10. [ASTM-D2344](https://www.astm.org/Standards/D2344.htm) – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates.
	11. [ASTM-D2583](#ASTM_D_2583) – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impresser.
	12. [ASTM-D2794](https://www.astm.org/Standards/D2794) – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
	13. [ASTM-D3029](#ASTM_D_3029) – Test Methods for Impact Resistance of Flat Rigid Plastic Specimens by Means of a Tup (Falling Weight) (Withdrawn 1995) (Replaced by ASTM-D5420).
	14. [ASTM-D5116](#ASTM_D_5116) – Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/ Products.
	15. [ASTM-D5420](https://www.astm.org/Standards/D5420.htm) – Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
	16. [ASTM-D6670](#ASTM_D_6607) – Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/ Products.
	17. [ASTM-E84](#ASTM_E_84) – Standard Test Method for Surface Burning Characteristics of Building Materials.
	18. [ASTM-E90](#ASTM_E_90) – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
	19. [ASTM-G-53](#Finishes) - Standard Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials
	20. [NFRC 100](#NFRC_100) – Procedure for Determining Fenestration Products U-Factors.
	21. [NFRC 400](#NFRC_400) – Procedure for Determining Fenestration Products Air Leakage.
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 an accredited independent testing agency certifying doors and frames comply with specified performance requirements listed in Section 2.04.
		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 the 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 identify 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-217, AF-150 frames, AF-250 frames: 3 years.
		3. Thresholds do not have a finish warranty.

**PART 2 PRODUCTS**

1. **COMPOSITE FIBERGLASS DOOR**
	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. Model.
		1. [AF-217BR³ Pebble Grain Composite Fiberglass Ballistic Door.](http://special-lite.com/product/af-217br-composite-fiberglass-ballistic-entrance/)
	2. Door Opening Size.
		1. Click or tap here to enter text.
	3. Construction.
		1. Door Thickness.
			1. 1-3/4” all locations other than door edge.
			2. 1-7/8” at door edge because of Stainless Steel edge banding.
		2. Stiles & Rails.
			1. Pultruded fiberglass with rabbited channel for accepting ballistic core material.
		3. Corners.
			1. Mitered.
			2. Chemically welded to stiles and rails.
			3. Mechanical fasteners to secure corner joints are not acceptable.
		4. Core.
			1. Sandwich panel consisting of PP Polypropylene Honeycomb, Fiberglass Ballistic Panel, and PP Polypropylene Honeycomb.
			2. PP Polypropylene Honeycomb.
				1. 5.0 pcf density.
				2. High strength to weight ratio.
				3. Corrosion, fungi, rot, chemical and moisture resistant.
				4. Sound and vibration dampening.
				5. Energy absorbing and recyclable.
		5. Face Sheet.
			1. Exterior
				1. 0.120” thick, pebble texture, through color with SpecLite 3® integral surfaseal film FRP sheet.
				2. Optional painted finish consult manufacturer.
				3. Class C standard.
			2. Interior
				1. 0.120” thick, pebble texture, through color with SpecLite 3® integral surfaseal film FRP sheet.
				2. Optional painted finish consult manufacturer.
				3. Class C standard optional Class A available consult manufacturer.
			3. Attachment of face sheet.
				1. Face sheets to be flame treated to promote durable, long-lasting bond.
				2. Face sheets adhered to stiles, rails, and core using hot melt adhesive evenly coated across all surfaces to produce strong bond and prevent moisture absorption.
		6. Edge Channels.
			1. 0.062” thick, 3/4” leg, stainless steel edge channel.
			2. Applied to entire perimeter of the door.
		7. Cutouts.
			1. Manufacture doors with cutouts for required vision lites, louvers, and panels.
		8. Hardware.
			1. Pre-machine doors in accordance with templates from specified hardware manufacturers.
			2. Surface mounted closures will be reinforced for but not prepped or installed at the factory.
		9. Reinforcements.
			1. Solid high-density polyurethane shapes chemically welded to stiles, rails and/ or core.
			2. No metallic reinforcements will be allowed.
3. **FRAMING**
	1. Framing
		1. AF-150BR³.
			1. Jamb Depth.
				1. 5-3/4”
			2. Materials.
				1. [See 2.05.A.](#Aluminum_Members)
			3. Perimeter Frame Members.
				1. ¼” thick pultruded fiberglass open throat with return.
				2. Factory fabricated.
				3. 2” or 4” face available for frame headers.
				4. Reinforced with ballistic fiberglass.
			4. Transoms and Sidelites.
				1. Consult manufacturer for details.
			5. Integral Door Stops.
				1. 5/8” x 2-1/4”.
			6. Frame Assembly.
				1. Single frames chemically welded at factory.
				2. Pairs knock down for field assembly.
			7. Frame Member to Member Connections.
				1. Corners mitered with 4” x 4” x 3/8” pultruded FRP angle reinforcement with interlocking pultruded FRP brackets.
				2. All member-to-member connections chemically welded at factory unless in a knock down configuration.
				3. Provide hairline butt joint appearance.
			8. Reinforcements.
				1. ¼” thick pultruded FRP chemically welded to frame at all hinges, strike, and closer locations.
			9. Hardware
				1. Pre-machine and reinforce frame members for hardware in accordance with manufacturer's standards and door hardware schedule.
				2. Surface mounted closures will be reinforced for but not prepped or installed at the factory.
			10. Anchors:
				1. Masonry.

Existing concrete or block punch and dimple.

* + - * 1. Drywall.

Standard punch and dimple.

1. **PERFORMANCE**
	1. Face Sheet.
		1. Standard Interior and Exterior Class C 0.120” thick, pebble texture, through color with SpecLite 3® integral surfaseal film FRP sheet.
			1. Flexural Strength, ASTM-D790: 21 x 103 psi.
			2. Flexural Modulus, ASTM-D790: 0.7 x 106 psi.
			3. Tensile Strength, ASTM-D638: 13 x 103 psi.
			4. Tensile Modulus, ASTM-D638: 1.2 x 106 psi.
			5. Barcol Hardness, ASTM-D2583: 55.
			6. Izod Impact, ASTM-D256: 14.0 ft-lb/in.
			7. Gardner Impact Strength, ASTM-D5420: 120 in-lb.
			8. Water Absorption, ASTM-D570: 0.20%/24hrs at 77°F.
			9. Surface Burning, ASTM-E84: Flame Spread ≤ 200, Smoke Developed ≤ 450.
			10. Taber Abrasion Resistance, Taber Test: 0.007% Max Wt. Loss, cs-17 wheels, 1000g. Wt., 25 cycles.
			11. 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 SpecLite 3® integral 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 SpecLite 3® integral 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. Optional Interior Face Only Class A 0.120” thick, pebble texture, through color with SpecLite 3® integral surfaseal film FRP sheet.
			1. Flexural Strength, ASTM-D790: 13 x 103 psi.
			2. Flexural Modulus, ASTM-D790: 0.57 x 106 psi.
			3. Tensile Strength, ASTM-D638: 6.8 x 103 psi.
			4. Tensile Modulus, ASTM-D638: 0.90 x 106 psi.
			5. Barcol Hardness, ASTM-D2583: 40.
			6. Izod Impact, ASTM-D256: 12.0 ft-lb/in notched.
			7. Gardner Impact Strength, ASTM-D3029: 45 in-lb.
			8. Water Absorption, ASTM-D570: 0.32%/24hrs at 77°F.
			9. Surface Burning, ASTM-E84: Flame Spread ≤ 25, Smoke Developed ≤ 450.
			10. Taber Abrasion Resistance, Taber Test: 0.02% Max Wt. Loss, cs-17 wheels, 1000g. Wt., 25 cycles.
	1. Stiles & Rails.
		1. Fastener Withdrawal, ASTM-D1761: 894 lbs.
	2. AF-150 Framing.
		1. Tensile Strength, ASTM-D638: 15,900 psi.
		2. Tensile Modulus of Elasticity, ASTM-D638: 1.58 x 106 psi.
		3. Maximum Compressive Strength, ASTM-D695: 15,500 psi.
		4. Compressive Modulus of Elasticity, ASTM-D695: 6.7 x 105 psi.
		5. Flexural Strength, ASTM-D790: 39.3 x 103 psi.
		6. Flexural Modulus, ASTM-D790: 1.23 x 106 psi.
		7. Izod Impact, ASTM-D256: 8.1 ft-lb/in.
		8. Barcol Hardness, ASTM-D2583: 57.
		9. Specific Gravity, ASTM-D792: 1.45 @ 23 °C.
		10. Density, ASTM-D792: 1445.6 kg.m3 @ 23 °C.
		11. Coefficient of Linear Expansion, ASTM-D696: 1.26 x 10-5 in/in/°F.
		12. Short Beam Strength, ASTM-D2344: 3,980 psi.
		13. Fastener Withdrawal, ASTM-D1761: 924 lbs.
		14. Percent Fiberglass: 60%.
	3. AF-150BR³ Framing.
		1. Tensile Strength, ASTM-D638: 15,900 psi.
		2. Tensile Modulus of Elasticity, ASTM-D638: 1.58 x 106 psi.
		3. Maximum Compressive Strength, ASTM-D695: 15,500 psi.
		4. Compressive Modulus of Elasticity, ASTM-D695: 6.7 x 105 psi.
		5. Flexural Strength, ASTM-D790: 39.3 x 103 psi.
		6. Flexural Modulus, ASTM-D790: 1.23 x 106 psi.
		7. Izod Impact, ASTM-D256: 8.1 ft-lb/in.
		8. Barcol Hardness, ASTM-D2583: 57.
		9. Specific Gravity, ASTM-D792: 1.45 @ 23 °C.
		10. Density, ASTM-D792: 1445.6 kg.m3 @ 23 °C.
		11. Coefficient of Linear Expansion, ASTM-D696: 1.26 x 10-5 in/in/°F.
		12. Short Beam Strength, ASTM-D2344: 3,980 psi.
		13. Fastener Withdrawal, ASTM-D1761: 924 lbs.
		14. Percent Fiberglass: 60%.
		15. Ballistic Resistance.
			1. UL-752 Level 3.
			2. NIJ-STD-0108.01 Level 3A.
	4. Door and AF-150BR³ Frame Assembly.
		1. Ballistic Resistance.
			1. UL-752 Level 3.
			2. NIJ-STD-0108.01 Level 3A.
		2. Thermal Transmittance, NFRC 100.
			1. Opaque Swinging Door (< than 50% glass)
				1. U-Factor = 0.24 Btu/hr∙ft²∙°F.
		3. Air Leakage, NFRC 400, ASTM-E283.
			1. Opaque Swinging Door (< than 50% glass)
				1. 0.01 cfm/sqft @ 1.57 psf.
				2. 0.01 cfm/sqft @ 6.24 psf.
1. **MATERIALS**
	1. Fiberglass.
		1. Face Sheet.
			1. [See 2.04.A.](#Face_Sheet)
		2. Stiles & Rails.
			1. [See 2.04.B.](#Stiles_and_Rails)
		3. Framing
			1. [See 2.04.C.](#AF_150_Framing)
	2. Fasteners.
		1. All exposed fasteners will have a finish to match the 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. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
		4. All cut edges to be free of burs.
		5. Electrical arc welding of doors or frames is not acceptable.
		6. Maintain continuity of line and accurate relation of planes and angles.
		7. 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/SpecLite3_FRP_Color_Chart.pdf)

Choose an item.

* 1. Door.
		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-solid, 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-solid, 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-solid, 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.
		3. 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-solid, 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.
1. **ACCESSORIES**
	1. [Vision Lites.](http://special-lite.com/product/vision-lites/)
		1. [Model.](http://special-lite.com/wordpress/wp-content/uploads/files/Categories/Hardware%20%26%20Lites/Fiberglass%20Hardware%20%26%20Lites/Literature/AF_Lites_Louvers.pdf)
			1. AF-BR³LK.
		2. Size.
			1. Choose an item.
		3. Glazing Material.
			1. Choose an item.
		4. Glazing Thickness.
			1. 1.25”.
	2. [Hardware.](http://special-lite.com/product-category/products/hardware_land_lites/aluminum_hardware_lites/)
		1. Pre-machine doors in accordance with templates from specified hardware manufactures and hardware schedule.
		2. Hardware Schedule.
			1. Choose an item.
				1. Hinges.

Choose an item. Click or tap here to enter text.

* + - * 1. Locking Hardware.

Click or tap here to enter text.

* + - * 1. Flush/ Surface Bolts.

Click or tap here to enter text.

* + - * 1. [Door Pulls.](http://special-lite.com/product/door-pulls-pushbars/)

Choose an item.

* + - * 1. [Push Bars.](http://special-lite.com/product/door-pulls-pushbars/)

Choose an item.

* + - * 1. [Door Sweep.](http://special-lite.com/product/door-sweep/)

Choose an item.

* + - * 1. [Astragal.](http://special-lite.com/product/astragal/)

Choose an item.

* + - * 1. [Mullions.](http://special-lite.com/product/removable-mullion/)

Choose an item.

* + - * 1. [Thresholds.](http://special-lite.com/product/thresholds/)

Choose an item.

**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 not 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. The 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 the 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**