

**SECTION 08 17 43
PULTRUDED FIBERGLASS DOOR**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. AF-100 Smooth Pultruded Fiberglass Door.
- B. AF-100 Smooth Pultruded Fiberglass Door Installed in AF-150 Pultruded Fiberglass Framing.
- C. AF-100 Smooth Pultruded Fiberglass Door Installed in AF-250 Pultruded Fiberglass Framing.

1.02 RELATED SECTIONS

- A. Section 08 01 17 – Operation and Maintenance of Integrated Door Opening Assemblies.
- B. Section 08 06 71 – Door Hardware Schedule.
- C. Section 08 06 80 – Glazing Schedule.
- D. Section 08 10 00 – Doors and Frames.
- E. Section 08 12 16 – Aluminum Frames.
- F. Section 08 42 13 – Aluminum-Framed Entrances.
- G. Section 08 71 00 – Door Hardware.
- H. Section 08 91 26 – Door Louvers.

1.03 REFERENCES

- A. [AAMA 920](#) – Specification for Operating Cycle Performance of Side-Hinged Exterior Door Systems.
- B. [AAMA 1304](#) – Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems.
- C. [ASTM-C203](#) – Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
- D. [ASTM-C272](#) – Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions.
- E. [ASTM-C273](#) – Standard Test Method for Shear Properties of Sandwich Core Materials.
- F. [ASTM-C518](#) – Standard Test Method for Steady-State Thermal Transmission Properties by Means of Heat Flow Meter Apparatus.
- G. [ASTM-C1363](#) – Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.
- H. [ASTM-D1621](#) – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- I. [ASTM-D1622](#) – Standard Test Method for Apparent Density of Rigid Cellular Plastics.
- J. [ASTM-D1623](#) – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
- K. [ASTM-D1761](#) – Standard Test Methods for Mechanical Fasteners in Wood.
- L. [ASTM-D5116](#) – Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/ Products.
- M. [ASTM-D6670](#) – Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/ Products.
- N. [ASTM-E84](#) – Standard Test Method for Surface Burning Characteristics of Building Materials.
- O. [ASTM-E90](#) – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- P. [ASTM-E283](#) – Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- Q. [ASTM-E330](#) – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- R. [ASTM-E1886](#) – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- S. [ASTM-E1996](#) – Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Wind Borne Debris in Hurricanes.
- T. [ASTM-F1642-04](#) – Standard Test Method for Glazing Systems Subject to Air Blast Loading
- U. [NFRC 100](#) – Procedure for Determining Fenestration Products U-Factors.
- V. [NFRC 400](#) – Procedure for Determining Fenestration Products Air Leakage.

1.04 SUBMITTALS

- A. Must comply with Section 01 33 00 – Submittal Procedures.
- B. Action Submittals/ Informational Submittals.

1. Product Data.
 - a. 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.
 - a. Submit manufacturer's shop drawings, including elevations, sections, and details indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
 3. Samples.
 - a. Submit manufacturer's door sample composed of door face sheet, core, framing and finish.
 - b. Submit manufacturer's sample of standard colors for door face and frame.
 4. Testing and Evaluation Reports.
 - a. 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 2.04.
 5. Manufacturer Reports.
 - a. Manufacturer's Project References.
 1. Submit list of successfully completed projects including project name, location, name of architect, type, and quantity of doors manufactured.
- C. Closeout Submittals.
1. Operation and Maintenance Manual.
 - a. Submit manufacturer's maintenance and cleaning instructions for doors and frames, including maintenance and operating instructions for hardware.
 2. Warranty Documentation.
 - a. Submit manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

- A. 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.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery.
 1. Deliver materials to site in manufacturer's original, unopened, containers and packaging.
 2. Labels clearly identifying opening, door mark, and manufacturer.
- B. Storage.
 1. Store materials in a clean, dry area, indoors in accordance with manufacturer's instructions.
- C. Handling.
 1. Protect materials and finish from damage during handling and installation.

1.07 WARRANTY

- A. 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.
- B. Standard Period.
 1. Ten years starting on date of shipment.
- C. 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.
- D. Finish
 1. Painted AF-100, AF-150 frames, AF-250 frames: 3 years.
 2. Thresholds do not have a finish warranty.

PART 2 PRODUCTS

2.01 COMPOSITE FIBERGLASS DOOR

- A. Manufacturer.
 1. Special-Lite, Inc.
 - a. PO Box 6, Decatur, Michigan 49045.
 - b. Toll Free (800) 821-6531, Phone (269) 423-7068, Fax (800) 423-7610.
 - c. Web Site www.special-lite.com.

- d. E-Mail info@special-lite.com.

2.02 DESCRIPTION

- A. Model.
1. [AF-100 Smooth Pultruded Fiberglass Door](#).
- B. Door Opening Size.
1. [Click or tap here to enter text.](#)
- C. Construction.
1. Door Thickness.
 - a. 1-3/4".
 2. Pultruded as one monolithic panel with integral stiles.
 3. Stiles.
 - a. Seamless 9/16" thick solid FRP.
 4. Top Rail.
 - a. 6" pultruded tube profile designed to fit flush and be chemically welded inside of door cavity.
 5. Bottom Rail.
 - a. Standard pultruded inverted U channel designed to fit flush and be chemically welded inside the door which allows doors to be field trimmed.
 - b. Optional closed bottom rail.
 6. Core.
 - a. Polyurethane foam.
 - b. Minimum 6 pcf density.
 7. Face Sheet.
 - a. Smooth, pultruded FRP integral to construction of door.
 - b. Attachment of face sheet.
 1. Door to be pultruded as one monolithic panel.
 8. Cutouts.
 - a. Manufacture doors with cutouts for required vision lites, louvers, and panels.
 9. Hardware.
 - a. Pre-machine doors in accordance with templates from specified hardware manufacturers.
 - b. Surface mounted closures will be reinforced for but not prepped or installed at factory.
 10. Reinforcements.
 - a. No metallic reinforcements will be allowed.

2.03 FRAMING

- A. Framing
1. [AF-150](#).
 - a. [Jamb Depth](#).
 1. [Choose an item](#).
 - b. Materials.
 1. [See 2.05.A](#).
 - c. Perimeter Frame Members.
 1. 1/4" thick pultruded fiberglass open throat with return.
 2. Factory fabricated.
 3. 2" or 4" face available for frame headers.
 - d. Transoms and Sidelites.
 1. Same as perimeter frame members.
 2. Removable stop for 1/4", 5/8" or 1" glass or panels.
 - e. Integral Door Stops.
 1. 5/8" x 2-1/4".
 - f. Frame Assembly.
 1. Standard knock down.
 2. Optional chemically welded consult factory for details.
 - g. 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 knocked down at factory unless chemically welded at factory requested.
 3. Provide hairline butt joint appearance.
 - h. Reinforcements.
 1. 1/4" thick pultruded FRP chemically welded to frame at all hinge, strike, and closer locations.
 - i. 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 factory.
- j. Anchors:
 1. Masonry.
 - a. Existing concrete or block punch and dimple.
 - b. Sill anchor.
 - c. Concealed existing masonry anchor.
 - d. Fiberglass masonry t anchor.
 2. Drywall.
 - a. Standard jamb anchor tuck.
 - b. KD wrap.
 - c. Optional punch and dimple tuck with either metal or wood studs.
2. [AF-250](#).
 - a. Jamb Depth.
 1. 5-3/4".
 - b. Materials.
 1. [See 2.05.A](#).
 - c. Perimeter Frame Members.
 1. 3/16" thick pultruded fiberglass open throat with return.
 2. Factory fabricated.
 3. 2" or 4" face available for frame headers.
 - d. Integral Door Stops.
 1. 5/8" x 2-1/4".
 - e. Frame Assembly.
 1. Standard knock down.
 2. Optional chemically welded consult factory for details.
 - f. Frame Member to Member Connections.
 1. Corners mitered with 2" x 2" x 1/4" pultruded FRP angle reinforcement with interlocking pultruded FRP brackets.
 2. All member to member connections knocked down at factory unless chemically welded at factory requested.
 3. Provide hairline butt joint appearance.
 - g. Reinforcements.
 1. 1/4" thick pultruded FRP chemically welded to frame at all hinge, strike, and closer locations.
 - h. 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 factory.
 - i. Anchors:
 1. Masonry.
 - a. Existing concrete or block punch and dimple.
 - b. Sill anchor.
 - c. Concealed existing masonry anchor.
 - d. Fiberglass masonry t anchor.
 2. Drywall.
 - a. Punch and dimple for metal or wood studs.

2.04 PERFORMANCE

- A. Pultruded Fiberglass Skin.
 1. Surface Burning, ASTM-E84: Flame Spread \leq 25, Smoke Developed \leq 450.
 2. Tensile Strength, ASTM-D638: 12,300 psi.
 3. Percent Fiberglass: 50%.
- B. Stiles & Rails.
 1. Fastener Withdrawal, ASTM-D1761: 894 lbs.
- C. Door Core.
 1. Surface Burning, ASTM-E84: Flame Spread \leq 25, Smoke Developed \leq 450.
 2. Density, ASTM-D1622: 6.0 pcf.
 3. Compressive Strength, ASTM-D1621: 139 psi.
 4. Compressive Modulus = 4,527 psi.
 5. Shear Strength, ASTM-C273: 84 psi.
 6. Shear Modulus, ASTM-C273: 788 psi.

7. Tensile Modulus, ASTM-D1623: 136 psi.
 8. Flexural Strength, ASTM-C203: 204 psi.
 9. Flexural Modulus, ASTM-C203: 4,767 psi.
 10. K-Factor, ASTM-C518: 0.16 Btu-in/hr-ft²·°F.
 11. R-Factor, ASTM-C518: 6.25 hr-ft²·°F/Btu.
 12. Water Absorption, ASTM-C272: < 0.7% by volume.
- D. Door Panel.
1. Thermal Transmittance, ASTM-C1363-11: U-Factor = 0.13 Btu/hr-ft²·°F, R-Value = 7.42 hr-ft²·°F/Btu.
- E. 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%.
- F. Door and AF-150 Frame Assembly.
1. Physical Endurance, AAMA 920-11: 2,000,000 Cycles, No Damage.
 2. Thermal Transmittance, NFRC 100.
 - a. Opaque Swinging Door (< than 50% glass)
 1. U-Factor = 0.23 Btu/hr-ft²·°F.
 - b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
 1. U-Factor = 0.41 Btu/hr-ft²·°F.
 3. Air Leakage, NFRC 400, ASTM-E283.
 - a. Opaque Swinging Door (< than 50% glass)
 1. 0.03 cfm/sqft @ 1.57 psf.
 2. 0.06 cfm/sqft @ 6.24 psf.
 - b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
 1. 0.02 cfm/sqft @ 1.57 psf.
 2. 0.05 cfm/sqft @ 6.24 psf.
 4. STC and OITC, ASTM-E90: STC = 30, OITC = 28.
 5. Structural Performance, ASTM E-330.
 - a. Single Door, 3'0" x 7'0" overall size, single point latching.
 1. ± 180 psf design pressure, pass.
 6. Structural Performance, ASTM E-330.
 - a. Single Door, 3'0" x 7'0" overall size, single point latching.
 1. ± 100 psf design pressure, pass.
 7. Impact and Cycle Test, ASTM-E1886.
 - a. Single Door, 3'0" x 7'0" overall size, single point latching.
 1. 9 lbs. missile @ 50 fps, minimum 2 impacts, no rips, tears, or penetrations.
 2. ± 100 psf design pressure, pass.
 8. Forced Entry, AAMA 1304.
 - a. Single Door, 3'0" x 7'0" overall size, single point latching.
 1. 300lb Pull Test, pass.
 9. Blast Test, ASTM-F1642.
 - a. 6.9 psi @ 48 psi-msec, no hazard, GSA performance condition 2.

2.05 MATERIALS

- A. Fiberglass.
1. Face Sheet.
 - a. [See 2.04.A.](#)
 2. Stiles & Rails.
 - a. [See 2.04.B.](#)
 3. Framing
 - a. [See 2.04.C.](#)

- B. 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.

2.06 FABRICATION

- A. 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.
- B. 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.

2.07 FINISHES

- A. Door.
 1. Two-part aliphatic polyurethane paint.
 - a. Color.
 1. Choose an item.
 - b. Custom colors available consult manufacturer.
 - c. Unique, high-solids, high-build, multifunctional coating.
 - d. Low VOC, high-gloss, self-priming coating.
 - e. Impact Resistance, ASTM-D2794: 140 in-lbs (direct), 50 in-lbs (reverse) @ 5 mils thickness.
 - f. Taber Abrasion, 1 kg load, 1000 cycles, CS-17 wheel: 60.2 mg.
 - g. Graffiti cleaning with Amerase with gloss retention: 100 cycles.
 - h. Chemical Resistance.
 1. Excellent.
 - a. Acidic.
 - b. Alkaline.
 - c. Salt Solutions.
 - d. Seawater.
 - e. Fresh Water.
 - f. Petroleum Products.
- B. Frame
 1. Fiberglass.
 - a. Two-part aliphatic polyurethane paint.
 1. Color.
 - a. Choose an item.
 2. Custom colors available consult manufacturer.
 3. Unique, high-solids, high-build, multifunctional coating.
 4. Low VOC, high-gloss, self-priming coating.
 5. Impact Resistance, ASTM-D2794: 140 in-lbs (direct), 50 in-lbs (reverse) @ 5 mils thickness.
 6. Taber Abrasion, 1 kg load, 1000 cycles, CS-17 wheel: 60.2 mg.
 7. Graffiti cleaning with Amerase with gloss retention: 100 cycles.
 8. Chemical Resistance.
 - a. Excellent.
 1. Acidic.
 2. Alkaline.
 3. Salt Solutions.
 4. Seawater.
 5. Fresh Water.
 6. Petroleum Products.
- C. Aluminum Vision Lites and Louvers.
 1. Aluminum.
 - a. Mill.
 1. AA-M10C22A21-Flash.

- b. Anodizing.
 - 1. Class 1 Anodizing, minimum 0.7 mils thick.
 - a. [Color.](#)
 - 1. Choose an item.
- c. Paint.
 - 1. Aluminum.
 - a. KYNAR®.
 - 1. Topcoat.
 - a. 70% KYNAR® or HYLAR® 5000 Coating, meets or exceeds all AAMA 2605 specifications, 2.5 to 4.0 wet mils, 1.00 to 1.20 dry mils.
 - 2. [Color.](#)
 - a. Consult manufacturer.
- d. Powder Coat.
 - 1. Special-Lite's® Wood Expressions™.
 - a. [Color.](#)
 - 1. Choose an item.
 - b. Durability against humidity, warping and cracking.
 - c. Resists fading from UV rays.
 - d. Natural, high-definition grains with the look and feel of real wood.
 - e. Durable powder coat protects against scratching.

2.08 ACCESSORIES

- A. [Fiberglass Vision Lites.](#)
 - 1. [Model.](#)
 - a. All Fiberglass.
 - 2. Size.
 - a. Choose an item.
 - 3. Glazing Thickness.
 - a. Choose an item.
- B. [Aluminum Vision Lites.](#)
 - 1. [Model.](#)
 - a. Choose an item.
 - 2. Glazing Thickness.
 - a. Choose an item.
 - 3. Rectangular Lites.
 - 1. Size, as indicated on drawings.
 - b. [Rectangular Vision Lite Accessories.](#)
 - 1. [Security Gate.](#)
 - a. SL-SG349.
 - 1. Frame perimeter is 1" x 1" x 1/8" steel angle.
 - 2. Grate material is 14-gauge steel sheet perforated with 1/4" diameter round holes.
 - 2. [Vandal Screen.](#)
 - a. SL-SG350.
 - 1. Frame perimeter is aluminum.
 - 2. Screen material is 16-gauge stainless steel sheet perforated with 1/4" diameter round holes.
 - 3. Finish.
 - a. [Color.](#)
 - c. Other Shapes.
 - 1. Attach drawing for vision lite shape.
 - C. [Fiberglass Louvers.](#)
 - 1. Size.
 - a. Choose an item.
 - 2. Factory installed.
 - 3. Exterior side of louver shall be free of fasteners.
 - 4. Pultruded fiberglass.
 - 5. Finish to match door.
 - D. [Aluminum Louvers.](#)
 - 1. Size, as indicated on drawings.
 - 2. Finish.
 - a. [Color.](#)

3. Factory installed.
 4. 1" thick Y-Type fixed blade, 12" minimum from the bottom of the door.
 5. Exterior side of louver shall be free of fasteners.
 6. Optional insect screen.
- E. [Hardware.](#)
1. Pre-machine doors in accordance with templates from specified hardware manufactures and hardware schedule.
 2. Hardware Schedule.
 - a. [Choose an item.](#)
 1. Hinges.
 - a. [Choose an item. Click or tap here to enter text.](#)
 2. Locking Hardware.
 - a. [Click or tap here to enter text.](#)
 3. Flush/ Surface Bolts.
 - a. [Click or tap here to enter text.](#)
 4. [Door Pulls.](#)
 - a. [Choose an item.](#)
 5. [Push Bars.](#)
 - a. [Choose an item.](#)
 6. [Door Sweep.](#)
 - a. [Choose an item.](#)
 7. [Astragal.](#)
 - a. [Choose an item.](#)
 8. [Mullions.](#)
 - a. [Choose an item.](#)
 9. [Thresholds.](#)
 - a. [Choose an item.](#)

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive doors.
- B. Notify architect of conditions that would adversely affect installation or subsequent use.
- C. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

3.03 ERECTION

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by architect.
- E. Set thresholds in bed of mastic and back seal.
- F. Install exterior doors to be weathertight in closed position.
- G. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by architect.
- H. Remove and replace damaged components that cannot be successfully repaired as determined by architect.

3.04 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services.
 1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.

3.05 ADJUSTING

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.06 CLEANING

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish.

3.07 PROTECTION

- A. 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