

**SECTION 08 17 43**  
**FRP/ Aluminum Hybrid Doors**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. SL-17 Pebble Grain FRP/ Aluminum Hybrid Door.
- B. SL-17 Pebble Grain FRP/ Aluminum Hybrid Door installed in Aluminum Framing.
- C. SL-20 Sandstone Texture FRP/ Aluminum Hybrid Door.
- D. SL-20 Sandstone Texture FRP/ Aluminum Hybrid Door installed in Aluminum Framing.

**1.02 RELATED SECTIONS**

- A. Section 08 11 16 – Wide Stile Monumental Doors
- B. Section 08 71 00 – Door Hardware

**1.03 REFERENCES**

- A. [AAMA 1304](#) – Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems.
- B. [AAMA 1503-98](#) – Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- C. [ANSI A250.4](#) – Test Procedure and Acceptance Criteria for Physical Endurance of Steel Doors and Hardware Reinforcing.
- D. [ASTM-B117](#) – Standard Practices for Operating Salt Spray (Fog) Apparatus.
- E. [ASTM-B209](#) – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- F. [ASTM-B221](#) – Standard Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- G. [ASTM-C518](#) – Standard test Method for Steady-State Thermal Transmission Properties by Means of Heat Flow Meter Apparatus.
- H. [ASTM-D256](#) – Standard Test Methods for Determining the Pendulum Impact Resistance of Plastics.
- I. [ASTM-D570](#) – Standard Test Method for Water Absorption of Plastics.
- J. [ASTM-D638](#) – Standard Test Method for Tensile Properties of Plastics.
- K. [ASTM-D790](#) – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- L. [ASTM-D1621](#) – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- M. [ASTM-D1622](#) – Standard Test Method for Apparent Density of Rigid Cellular Plastics.
- N. [ASTM-D1623](#) – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
- O. [ASTM-D2126](#) – Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
- P. [ASTM-D2583](#) – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
- Q. [ASTM-D3029](#) – Test Methods for Impact Resistance of Flat Rigid Plastic Specimens by Means of a Tup (Falling Weight) (Withdrawn 1995) (Replaced by ASTM-D5420).
- R. [ASTM-D5116](#) – Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/ Products.
- S. [ASTM-D5420](#) – Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
- T. [ASTM-D6670](#) – Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/ Products.
- U. [ASTM-E84](#) – Standard Test Method for Surface Burning Characteristics of Building Materials.
- V. [ASTM-E90](#) – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- W. [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.
- X. [ASTM-E330](#) – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- Y. [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.
- Z. [ASTM-E1996](#) – Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Wind Borne Debris in Hurricanes.
- AA. [ASTM-F476](#) – Standard Test Methods for Security of Swinging Door Assemblies.

- BB. [ASTM-F1642-04](#) – Standard Test Method for Glazing Systems Subject to Air Blast Loading.
- CC. [NWWDA T.M. 7-90](#) – Cycle Slam Test Method.
- DD. [NFRC 100](#) – Procedure for Determining Fenestration Products U-Factors.
- EE. [NFRC 400](#) – Procedure for Determining Fenestration Products Air Leakage.
- FF. [TAS 201](#) – Impact Test Procedures.
- GG. [TAS 202](#) – Criteria for Testing Impact & Nonimpact Resistant Building Envelope Components Using Uniform Static Air Pressure.
- HH. [TAS 203](#) – Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

#### **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. Kynar painted aluminum: 10 years.
2. Painted SL-17, SL-18, SL-19, SL-19-1, and SL-20 face sheets: 5 years.
3. Painted AF-150 frames, AF-250 frames: 3 years.
4. Anodized, aluminum: 10 years.
5. Thresholds do not have a finish warranty.

## PART 2 PRODUCTS

### 2.01 FRP/ALUMINUM HYBRID DOORS

#### 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](http://www.special-lite.com).
  - d. E-Mail [info@special-lite.com](mailto:info@special-lite.com).

### 2.02 DESCRIPTION

#### A. Model.

1. [SL-17 Pebble Grain FRP/ Aluminum Hybrid Door.](#)
2. [SL-20 Sandstone Texture FRP/ Aluminum Hybrid Door.](#)

#### B. Door Opening Size.

1. **Contractor to verify**

#### C. Construction.

1. Door Thickness.
  - a. 1-3/4".
2. Stiles & Rails.
  - a. Aluminum extrusions made from 6063 aluminum alloys with a minimum temper of T5.
  - b. Minimum 2-5/16" deep one-piece extrusion with have integral reglets to accept face sheet on both interior and exterior side of door which secure face sheet into place and permit flush appearance.
  - c. Screw or snap in place applied caps are not acceptable.
  - d. Top rails must have integral legs for interlocking continuous extruded aluminum flush cap.
  - e. Bottom rails must have integral legs for interlocking continuous weather bar with single nylon brush weather stripping or manually adjustable SL-301 door bottom with two nylon brush weather stripping.
  - f. Meeting stiles to include integral pocket to accept pile brush weather seal.
3. Corners.
  - a. Mitered.
  - b. Secured with 3/8" diameter full-width steel tie rod through extruded splines top and bottom which are integral to standard tubular shaped rails.
  - c. 1-1/4" x 1-1/4" x 3/16" 6061 aluminum angle reinforcement at corner to give strong, flat surface for locking hex nut to bear on.
  - d. Weld, glue, or other methods of corner joinery are not acceptable.
4. Core.
  - a. Poured-in-place polyurethane foam.
  - b. Laid in foam cores are not acceptable.
  - c. Foam Plastic Insulated Doors: IBC 2603.4.
    1. Foam plastic shall be separated from the interior of a building by an approved thermal barrier.
    2. Approved thermal barrier must meet the acceptance criteria of the Temperature Transmission Fire Test and Integrity Fire Test as stated in NFPA 275.
    3. IBC 2603.4.1.7 foam plastic insulation, having a flame spread index less than 75 and a smoke developed index of not more than 450 shall be permitted as a door core when the face is metal minimum 0.032" aluminum or 0.016" steel.
    4. Standard door assembly can be tested to show it meets these requirements without the use of thermal barrier. If no independent testing conducted all doors with foam plastic core must have a thermal barrier.
5. Face Sheet.
  - a. Exterior
    1. 0.120" thick, pebble texture, through color with integral surfaseal film FRP sheet.
    2. Optional painted finish consult manufacturer.
    3. Class C standard.
  - b. Interior

1. 0.120" thick, pebble texture, through color with integral surfaseal film FRP sheet.
2. Optional painted finish consult manufacturer.
3. Class C standard optional Class A available consult manufacturer.
- c. Attachment of face sheet.
  1. Extruded stiles and rails to have integral reglets to accept face sheet on both interior and exterior side of door which secure face sheet into place and permit flush appearance.
  2. Use of glue to bond face sheet to core or extrusions is not acceptable.
6. Cutouts.
  - a. Manufacture doors with cutouts for required vision lites, louvers, and panels.
7. 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.
  - c. Factory install door hardware.
8. Reinforcements.
  - a. Aluminum extrusions made from 6061 or 6063 aluminum alloys.
  - b. Sheet and plate to conform to ASTM-B209.
  - c. Alloy and temper to be selected by manufacturer for strength, corrosion resistance, and application of required finish, and control of color.
  - d. Bars and tubes to meet ASTM-B221.

## 2.03 FRAMING

### A. Framing

1. [Aluminum Tube Framing with Applied Stops.](#)
  - a. Materials.
    1. [See 2.05.A.](#)
  - b. Perimeter Frame Members.
    1. Box type with 4 enclosed sides.
    2. Factory fabricated.
    3. Open-back framing is not acceptable.
  - c. Applied Door Stops.
    1. 5/8" x 1-1/4" or 5/8" x 1-3/4", 0.125" wall thickness, with screws and weather-stripping.
    2. Provide solid 1/2" aluminum bar behind door stop for closer shoe attachment.
    3. Pressure gasketing for weathering seal.
    4. Counterpunch fastener holes in door stop to preserve full-metal thickness under fastener head.
  - d. Caulking.
    1. Caulk joints before assembling frame members.
  - e. Frame Member to Member Connections.
    1. Secure joints with fasteners.
    2. Provide hairline butt joint appearance.
  - f. 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.
    3. Factory install door hardware.
  - g. Anchors:
    1. Anchors appropriate for wall conditions to anchor framing to wall materials.
    2. Door Jamb and Header Mounting Holes: Maximum of 24-inch centers.
    3. Secure head and sill members of transom, side lites, and similar conditions.

## 2.04 PERFORMANCE

### A. Face Sheet.

1. Standard Interior and Exterior Class C 0.120" thick, pebble texture, through color with integral surfaseal film FRP sheet.
  - a. Flexural Strength, ASTM-D790:  $21 \times 10^3$  psi.
  - b. Flexural Modulus, ASTM-D790:  $0.7 \times 10^6$  psi.
  - c. Tensile Strength, ASTM-D638:  $13 \times 10^3$  psi.
  - d. Tensile Modulus, ASTM-D638:  $1.2 \times 10^6$  psi.
  - e. Barcol Hardness, ASTM-D2583: 55.
  - f. Izod Impact, ASTM-D256: 14.0 ft-lb/in.
  - g. Gardner Impact Strength, ASTM-D5420: 120 in-lb.
  - h. Water Absorption, ASTM-D570: 0.20%/24hrs at 77°F.
  - i. Surface Burning, ASTM-E84: Flame Spread  $\leq 200$ , Smoke Developed  $\leq 450$ .

- j. Taber Abrasion Resistance, Taber Test: 0.007% Max Wt. Loss, cs-17 wheels, 1000g. Wt., 25 cycles.
- k. Chemical Resistance.
  - 1. Excellent Rating.
    - a. Acetic Acid, Concentrated.
    - b. Acetic Acid, 5%.
    - c. Bleach Solution.
    - d. Detergent Solution.
    - e. Distilled Water.
    - f. Ethyl Acetate.
    - g. Formaldehyde.
    - h. Heptane.
    - i. Hydrochloric Acid, 10%.
    - j. Hydrogen Peroxide, 3%.
    - k. Isooctane.
    - l. Lactic Acid, 10%.
- l. 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.
- 2. Optional Interior Face Only Class A 0.120" thick, pebble texture, through color with integral surfaseal film FRP sheet.
  - a. Flexural Strength, ASTM-D790:  $13 \times 10^3$  psi.
  - b. Flexural Modulus, ASTM-D790:  $0.57 \times 10^6$  psi.
  - c. Tensile Strength, ASTM-D638:  $6.8 \times 10^3$  psi.
  - d. Tensile Modulus, ASTM-D638:  $0.90 \times 10^6$  psi.
  - e. Barcol Hardness, ASTM-D2583: 40.
  - f. Izod Impact, ASTM-D256: 12.0 ft-lb/in notched.
  - g. Gardner Impact Strength, ASTM-D3029: 45 in-lb.
  - h. Water Absorption, ASTM-D570: 0.32%/24hrs at 77°F.
  - i. Surface Burning, ASTM-E84: Flame Spread  $\leq 25$ , Smoke Developed  $\leq 450$ .
  - j. Taber Abrasion Resistance, Taber Test: 0.02% Max Wt. Loss, cs-17 wheels, 1000g. Wt., 25 cycles.
- B. Door Core.
  - 1. Density, ASTM-D1622:  $\leq 5.0$  pcf.
  - 2. Compressive Properties, ASTM-D1621: Compressive Strength  $\geq 60$  psi, Compressive Modulus  $\geq 1948$  psi.
  - 3. Tensile and Tensile Adhesion Properties, ASTM-D1623: Tensile Adhesion, 3" x 3" FRP Facers  $\geq 53$  psi, Tensile Adhesion, 1" x 1" Foam  $\geq 104$  psi.
  - 4. Thermal and Humid Aging, ASTM-D2126: Volume Change at 158 °F, 100% humidity, 14 days  $\leq 13\%$ .
  - 5. Thermal Conductivity, ASTM-C518, Thermal Resistance  $\geq 0.10$  m<sup>2</sup>K/W.
- C. Door Panel.
  - 1. Thermal Transmittance, AAMA 1503-98: U-Factor = 0.29 Btu/hr·ft<sup>2</sup>·°F, CRFp = 55.
  - 2. Indoor Air Quality, ASTM-D5116, ASTM-D6607: GreenGuard, GreenGuard Gold.
- D. Door and Aluminum Tube Frame Assembly.
  - 1. Physical Endurance, ANSI A250.4: 25,000,000 Cycles, No Damage.
  - 2. Salt Spray, ASTM-B117: 500 hours minimum exposure.
  - 3. Air Leakage, NFRC 400, ASTM-E283.
    - a. Opaque Swinging Door (< than 50% glass)
      - 1. 0.01 cfm/sqft @ 1.57 psf.
      - 2. 0.01 cfm/sqft @ 6.24 psf.
    - b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
      - 1. 0.38 cfm/sqft @ 1.57 psf.
      - 2. 0.73 cfm/sqft @ 6.24 psf.
  - 4. Structural Performance, ASTM E-330.
    - a. Single or Pair of Doors, 8'4" x 8'2" overall size, single point latching.
      - 1.  $\pm 75$  psf design pressure, pass.
  - 5. Impact and Cycle Test, ASTM-E1886.
    - a. Single or Pair of Doors, 6'8" x 7'8" overall size, 3-point latching.
      - 1. 9 lbs. missile @ 50 fps, minimum 3 impacts, no rips, tears, or penetrations.
      - 2.  $\pm 75$  psf design pressure, pass.

6. Forced Entry, AAMA 1304.
  - a. Single or Pair of Doors, 6'8" x 7'8" overall size, 3-point latching.
    1. 300lb Pull Test, pass.
7. Impact Test, TAS 201.
  - a. Single or Pair of Doors, 6'8" x 7'8" overall size, 3-point latching.
    1. 9 lbs. missile @ 50 fps, minimum 3 impacts, no rips, tears, or penetrations.
8. Static Air Pressure, TAS 202.
  - a. Single or Pair of Doors, 6'8" x 7'8" overall size, 3-point latching.
    1.  $\pm 65$  psf design pressure, pass.
    2. Forced Entry, 300lb Pull Test, pass.
9. Cyclic Wind Pressure Loading, TAS 203.
  - a. Single or Pair of Doors, 6'8" x 7'8" overall size, 3-point latching.
    1.  $\pm 65$  psf design pressure, pass.
10. Security Test, ASTM-F476: Minimum Grade 40.
11. Blast Test, ASTM-F1642.
  - a. 6 psi @ 45 psi-msec, minimal hazard, operable.
- E. Door and Thermally Broken Aluminum Frame Assembly.
  1. Thermal Transmittance, NFRC 100.
    - a. Opaque Swinging Door (< than 50% glass)
      1. U-Factor = 0.31 Btu/hr-ft<sup>2</sup>-°F.
    - b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
      1. U-Factor = 0.64 Btu/hr-ft<sup>2</sup>-°F.
  2. Air Leakage, NFRC 400, ASTM-E283.
    - a. Opaque Swinging Door (< than 50% glass)
      1. 0.01 cfm/sqft @ 1.57 psf.
      2. 0.01 cfm/sqft @ 6.24 psf.
    - b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
      1. 0.38 cfm/sqft @ 1.57 psf.
      2. 0.73 cfm/sqft @ 6.24 psf.
  3. Sound Transmission, ASTM-E90: STC = 30, OITC = 29.
- F. Door and AF-150 Frame Assembly.
  1. Thermal Transmittance, NFRC 100.
    - a. Opaque Swinging Door (< than 50% glass)
      1. U-Factor = 0.32 Btu/hr-ft<sup>2</sup>-°F.
    - b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
      1. U-Factor = 0.57 Btu/hr-ft<sup>2</sup>-°F.
  2. Air Leakage, NFRC 400, ASTM-E283.
    - a. Opaque Swinging Door (< than 50% glass)
      1. 0.12 cfm/sqft @ 1.57 psf.
      2. 0.06 cfm/sqft @ 6.24 psf.
    - b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
      1. 0.04 cfm/sqft @ 1.57 psf.
      2. 0.14 cfm/sqft @ 6.24 psf.
- G. Door and Hollow Metal Steel Frame.
  1. Cycle Slam, NWWDA T.M. 7-90.
    - a. 5,000,000 cycles.
      1. No Operational Damage.
      2. No Hinge Separation.
- H. AF-150 Framing.
  1. Tensile Strength, ASTM-D638: 15,900 psi.
  2. Tensile Modulus of Elasticity, ASTM-D638:  $1.58 \times 10^6$  psi.
  3. Maximum Compressive Strength, ASTM-D695: 15,500 psi.
  4. Compressive Modulus of Elasticity, ASTM-D695:  $6.7 \times 10^5$  psi.
  5. Flexural Strength, ASTM-D790:  $39.3 \times 10^3$  psi.
  6. Flexural Modulus, ASTM-D790:  $1.23 \times 10^6$  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.m<sup>3</sup> @ 23 °C.
  11. Coefficient of Linear Expansion, ASTM-D696:  $1.26 \times 10^{-5}$  in/in/°F.
  12. Short Beam Strength, ASTM-D2344: 3,980 psi.
  13. Fastener Withdrawal, ASTM-D1761: 924 lbs.

14. Percent Fiberglass: 60%.

## 2.05 MATERIALS

- A. Aluminum Members.
  - 1. Aluminum extrusions made 6061 or 6063 aluminum alloys.
  - 2. Sheet and plate to conform to ASTM-B209.
  - 3. Alloy and temper to be selected by manufacturer for strength, corrosion resistance, and application of required finish, and control of color.
- B. Fiberglass.
  - 1. See 2.02.C.5.
- C. 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. 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. Aluminum.
      - a. Mill.
        - 1. AA-M10C22A21-Flash.
      - b. Anodizing.
        - 1. Class 1 Anodizing, minimum 0.7 mils thick.
          - a. [Color](#).
            - 1. Per Door Schedule
      - 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. Per Door Schedule
    - 2. FRP Face Sheets
      - a. Through color.
        - 1. [Color](#).
          - a. Per Door Schedule
      - b. Painted.
        - 1. [Color](#).
          - a. Per Door Schedule
        - 2. Custom colors available consult manufacturer.
- B. Frame
  - 1. Aluminum.
    - a. Mill.
      - 1. AA-M10C22A21-Flash.
    - b. Anodizing.
      - 1. Class 1 Anodizing, minimum 0.7 mils thick.
        - a. [Color](#).
          - 1. Per Door Schedule

- 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. Per Door Schedule
- 2. Fiberglass.
  - a. Two-part aliphatic polyurethane paint.
    - 1. [Color.](#)
      - a. Per Door Schedule
    - 2. Custom colors available consult Owner.
    - 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.

## 2.08 ACCESSORIES

- A. [Vision Lites.](#)
  - 1. Factory Glazing.
    - a. Glazing Thickness.
      - 1. 3/8" School Guard Glass
    - b. Rectangular Lites.
      - a. Size, as indicated on Door Schedule
    - 2. [Rectangular Vision Lite Accessories.](#)
      - a. [Security Gate.](#)
        - 1. SL-SG349.
          - a. Frame perimeter is 1" x 1" x 1/8" steel angle.
          - b. Gate material is 14-gauge steel sheet perforated with 1/4" diameter round holes.
        - b. [Vandal Screen.](#)
          - 1. SL-SG350.
            - a. Frame perimeter is aluminum.
            - b. Screen material is 16-gauge stainless steel sheet perforated with 1/4" diameter round holes.
        - c. [Louvers.](#)
          - 1. Size, as indicated on drawings.
          - 2. Factory installed.
          - 3. 1" thick Y-Type fixed blade, 12" minimum from the bottom of the door.
          - 4. Exterior side of louver shall be free of fasteners.
          - 5. Optional insect screen.
        - d. Finish.
          - 1. [Per Owner](#)
    - 3. Other Shapes.
      - a. Attach drawing for vision lite shape.
- B. [BF-350 Bi-Fold Door Lite Kit.](#)
  - 1. Kitchen and Boiler room out swing doors where screen doors are not a practical place.
    - a. Completely Factory installed in the FRP Doors.
    - b. The bi-fold unit, when closed, locks securely in place with surface bolts. When open, it shutters in the open position and latches securely to the door stiles to avoid interference with normal traffic.
    - c. Fabricated with 1 3/4" FRP Panels (Poured-in Place Urethane Foam Core and .120 FRP Sheets), 1/2" x 1 1/4", 1" x 2" Aluminum Angles, 1" x 3/4" T Aluminum Bar and Stainless-Steel Insect Screen.



- d. Factory attached Hardware: Stainless Steel Piano Hinge, G.J. 21A Receptacle, G.J. 1642 Surface Bolts, G.J. 21A Hook and Reese 786 Weather-Strip.
  - e. Color to match door face sheet.
- C. Hardware.
- 1. Pre-machine doors in accordance with templates from specified hardware manufactures and hardware schedule.
  - 2. Factory install hardware:
    - 1. Concealed adjustable bottom brush.
      - a. SL-301.
        - 1. Not for use with CVR type hardware.
    - 2. Concealed adjustable meeting stile astragal.
      - a. SL-AS-4A
        - 1. Adjustable astragal by Special-Lite
  - 3. Hardware Schedule.
    - a. See Section 087100 Door Hardware
- D. Architectural Panels.
- 1. FRP Panels.
    - a. SL-37.
      - 1. Size, as indicated on Door Schedule.
      - 2. Thickness.
        - a. Per Door Schedule
      - 3. Face Sheet.
        - a. Material.
          - 1. Standard exterior and interior face, Class C 0.120" thick, pebble texture, through color with integral surfaseal film FRP sheet.
          - 2. Optional interior face only, Class A 0.120" thick, pebble texture, through color with integral surfaseal film FRP sheet.
        - b. Color - Per Door Schedule
    - 4. Performance.
      - a. Face Sheet.
        - 1. See 2.02.C.5.
      - b. 1" Thick Panel.
        - 1. Polyurethane foam core.
        - 2. Impervious to water.
        - 3. Thermal Performance, AAMA 1503-98.
          - a. U-Factor = 0.23 Btu/hr-ft<sup>2</sup>·°F.
          - b. CRFp = 81.
      - c. 1-3/4" Thick Panel.
        - 1. Wood or aluminum frame perimeter.
        - 2. Poured-in-place Polyurethane Foam Core.
        - 3. Thermal Performance, AAMA 1503-98.
          - a. U-Factor = 0.10 Btu/hr-ft<sup>2</sup>·°F.
          - b. CRFp = 87.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine areas to receive doors.
- B. Notify Owner 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 Owner.
- 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 Owner.

H. Remove and replace damaged components that cannot be successfully repaired as determined by Owner.

**3.04 FIELD QUALITY CONTROL**

A. Manufacture'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**