SECTION 08220 - FIBERGLASS REINFORCED PLASTIC DOORS

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing all fiberglass reinforced plastic (FRP) doors, frames, finish hardware, reinforcement and appurtenant work, complete.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 08710 Finish Hardware
2. Section 09800 Protective Coatings

1.3 CODES

A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:

1. Uniform Building Code

1.4 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

1. Commercial Standards:

ANSI/DHI A 115 Series	Doors and Frames
ANSI/NKCA A161.1	Construction and Performance Standards for Kitchen and Vanity Cabinets (Modified for Large Doors
ASTM B 117	Standard Test Method of Salt Spray (Fog) Testing
ASTM D 570	Standard Test Method for Water Absorption of Plastics
ASTM E 84	Test Method for Surface Burning Characteristics of Building Materials
ASTM G 23	Standard Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc Type)

1.5. SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted in compliance with Section 01300:

1. Product Data: CONTRACTOR shall submit manufacturer's technical product data substantiating that products comply with requirements.

2. Shop Drawings: Shop drawings shall be submitted for both fabrication and installation of fiberglass reinforced plastic doors and frames. They shall include the following:

a. Details of each frame type and each variation of opening condition with specific information on connections to adjoining materials. Show anchorage and accommodation of accessory items as they occur.

b. Elevations of each door design and type with specific information defining glass lites, louvers and other accessory items.

c. Details of construction, joints, connections and location and installation requirements of finish hardware and any supplemental reinforcement which may be necessary.

d. A schedule shall be provided of all doors and frames, using the same reference numbers for details and openings as those on the contract drawings.

e. Schedules shall show hardware as indicated in Section 08710 or as indicated elsewhere.

3. Samples: A full range of samples shall be provided for the CONSTRUCTION MANAGER'S selection; two samples, 6 inches square minimum, of each color and texture selected for factory-finished doors and frames.

1.6 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL in compliance with Section 01300:

1. Product Data: CONTRACTOR shall submit manufacturer's technical product data documenting maintenance and repair procedures. Calculations by a registered civil or structural engineer shall be submitted showing that the doors, frames, and their structural connections are designed to meet code requirements and loads. CONSTRUCTION MANAGER will review the calculations for completeness only.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Fiberglass reinforced plastic doors and frames shall be packaged in such a way as to prevent damage and scratching during shipment and handling.

B. Temporary stiffeners, spacers, and other accessories necessary to facilitate handling and accurate erection shall be provided.

C. **Delivery of Materials**: Products shall be delivered in original, unbroken, packages or containers bearing the manufacturer's label. Packages or containers shall be delivered to the site with seals unbroken.

D. **Storage**: Products shall be carefully stored in a manner that will prevent damage and in an area that is protected from the deleterious effects of the elements.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. **General**:

1. Doors, frames and accessory items shall be the products of a single manufacturer.

2. Flame Spread: All doors and frames shall be manufactured with fire retardant resins that have retained a Class 1 (UBC Classification) flame spread when tested in accordance with ASTM E 84 and NFPA by an independent laboratory. The entire door and frame assembly shall have a flame spread rating of 25 or less.

3. Doors, frames, transom panels and all related accessories shall be fabricated from premium grade, glass fiber reinforced, chemical resistant, flame retardant, isophthalic polyester resins. Components shall be fabricated to the greatest extent by "pultrusion" process where glass and synthetic filaments are saturated with polymer resins and pulled through steel dies to shape the profiles and control the reinforcement-to-matrix ratio.

4. Minimum physical properties for all components shall conform to the following:

   a. Reinforcement to matrix ratio: 65 percent to 35 percent, by weight
   b. Tensile strength: 55,000 psi
   c. Compressive strength: 50,000 psi
   d. Flexural strength: 50,000 psi
   e. Modulus of elasticity: 3.5×10^{6}
   f. Coefficient of thermal expansion: 5.5×10^{-5}

5. Door and frame assemblies may be used in an environment where exposure to sulfuric acid, chlorine, and other chemical agents are possible. The manufacturer shall select resins that are resistant to damage from such corrosive environments.

6. Door and frame assemblies shall meet or exceed the requirements of the following tests:

ANSI/NKCA A 161.1	100,000 open-close cycles with no visible wear or distress
ASTM B 117	300 hours minimum with no visible surface effect
ASTM D 570	No more than 0.2 percent absorption
ASTM G 23	1,000 hours exposure with no visible surface effect or reduction of gloss

B. **Doors and Transoms**:

1. Doors shall be full flush design and integral in every respect and have no visible seams or surface irregularities. Doors shall be rigid and neat in appearance and shall be free from warpage or buckle. Corner bends shall be true and straight and shall be of not less than the minimum radius for the door used. Tops of exterior doors shall be provided with flush weathertight construction.

2. Transom Panels: Transom panels shall be provided where indicated and shall be of the same construction as the doors.

3. Door and transom cores shall be isocyanurate/urethane, closed cell rigid foam, 2.0 lbs per cubic foot density, self extinguishing, Class 1 flame retardant material.

4. Glass fiber reinforcements shall include continuous strand mats, continuous strand roving and woven roving. No chopped strand materials shall be used.

5. The resin matrix shall be a cross-linking polymer, flame-retardant isophthalic polyester.

6. All component parts shall be surfaced with a 10 mil polyester nexus veil.

C. **Frames**: Frames shall be custom profiles, similar to hollow metal configurations, of sizes and shapes as indicated. Frames shall be "pultruded" sections with typical 0.1875-inch wall thickness. Jambs and headers shall be joined with hairline mitered corners and reinforced as required for a structural connection.

D. **Hardware**:

1. All hardware and fasteners, including screws, nuts and bolts, hinges, locksets, closers, kickplates, panic bars and foot and head bolts, shall be completely fabricated of stainless steel.

E. **Supports, Inserts, Anchors and Fasteners**:

1. Metal: All metal occurring as a part of, or related to, the door and frame assembly, shall be stainless steel.

2. Frames shall be provided with proper anchors as required and necessary for the specific installation.

3. Door frames for installation in masonry and concrete walls shall be provided with adjustable jamb anchors of the stainless steel T-strap, stirrup and strap, or wire type. The number of anchors provided per door jamb shall be as follows:

   a Frames up to 7-feet, 6-inches in height: 3 anchors
   b. Frames 7-feet, 6-inches to 8-feet in height: 4 anchors
   c. Frames over 8 feet in height: 4 anchors plus 1 additional anchor for each additional 2 feet or fraction thereof.

4. Door frames for installation in stud partitions shall be provided with stainless steel anchors of suitable design and shall not be less than 18 gauge thickness and shall be securely attached inside each jamb as follows:

   a. Frames up to 7-feet, 6-inches in height: 3 anchors
   b. Frames 7-feet, 6-inches to 8-feet in height: 5 anchors
   c. Frames over 8 feet in height: 5 anchors plus 1 additional anchor for each additional 2 feet or fraction thereof.

5. Dust Cover Boxes and Mortar Guards: Dust cover boxes or mortar guards of not less than 24 gauge stainless steel or fiberglass shall be provided at all hardware mortises on frames to be set in masonry, concrete, or plaster walls.

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[6. Anchors to Existing Construction: Frames to be anchored to previously placed concrete, masonry, or structural steel shall be provided with anchors of suitable design to meet job requirements.]

2.2 FABRICATION

A. Fabricate fiberglass reinforced door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant.

B. Clearly identify work that cannot be permanently factory-assembled before shipment to assure proper assembly at the project site.

C. **Imperfections:** After fabrication, all tool marks and other surface imperfections shall be filled, coated and made smooth.

D. **Doors:** Doors shall be rigid structural assemblies fabricated to size required plus or minus 0.10 inches, with a squareness tolerance, expressed as the difference between the diagonal measurements from corner to corner of plus or minus 0.25-inches, and with a flatness tolerance of plus or minus 0.1876-inches measured on a diagonal across the face of the door surface.

E. **Frames:** Frames shall be flush design, of profiles and sizes as indicated on the drawings. Frame wall thickness shall be no less than 0.1875-inch.

1. Assemblies: Frames shall be provided preassembled with doors prehung wherever practicable.

2. Door jamb depths, trim profile, and backbends shall be indicated on shop drawings.

3. Molded members shall be clean cut, straight, and shall be of uniform profile throughout their lengths.

4. Corner joints shall have all contact edges tightly closed with all trim faces mitered and finished smooth.

5. Reinforcing: Frames shall be provided with non-swelling polymer backing, corner reinforcement, anchor reinforcement and hardware reinforcement as required.

6. Mutes or Silencers: Appropriate holes for silencers shall be provided in those door frames which are not designated to receive weatherstripping or sound seals.

F. **Finish Hardware Preparation**:

1. Doors and frames to receive mortised and concealed finish hardware in accordance with final finish hardware schedule shall be prepared according to templates provided by the hardware supplier. Comply with applicable requirements of ANSI A 115 series specifications for door and frame preparation for hardware.

2. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at the project site.

3. Locate finish hardware as indicated on the final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware," published by the Door and Hardware Institute."

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[G. **Finishing**: Exterior surfaces of doors, frames and accessory products shall be factory finished with a pigmented resin gel coat with a textured semi-glass finish. Color shall be as

selected by the CONSTRUCTION MANAGER from manufacturer's standard color selection.]

[H. Exterior surfaces of doors, frames and accessory products shall be factory finished with standard semi-gloss textured surface to receive field-applied final finish as specified under Section 09800. Color shall be as selected by the CONSTRUCTION MANAGER from manufacturer's standard color selection.]

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I. **Accessory Items**:

1. Preparation of doors for [louvers] [and] [glass lites] shall be accomplished at the factory during manufacture and shall not be attempted in the field. Accessory cutouts shall be totally enclosed by pultruded shapes which shall be incorporated into the internal door subframe so that after moulding and machining, the penetration is sealed and watertight to completely exclude moisture from the interior of the door. Accessory items shall only be installed after the cutout is so enclosed.

2. Louvers: Sightproof, stationary louvers shall be provided for interior doors in the sizes and configurations indicated, constructed of inverted V-shaped or Y-shaped blades formed of fiberglass plastic set into reinforced plastic frames. Louvers shall be factory installed.

3. Glass Lites: Glass lites shall conform to the configurations indicated. Lites shall be factory installed and glazed prior to shipment. [Single] [Double] lites shall be provided as indicated. [Plastic] [Stainless steel] shall be employed for glazing stops or mouldings.

2.3 MANUFACTURERS

A. Products of the type indicated shall be manufactured by one of the following (or equal):

1. Chem-Pruf Door Co.
2. Corrim Door Systems Division, Fenestra Corporation
3. Fiberglass Technologies, Inc.
4. Vega Technologies, Inc.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. **General**: Install fiberglass reinforced plastic doors, frames and accessories in accordance with manufacturer's recommendations.

B. **Placing Frames**:

1. Frames shall be set plumb and square in a true plane. Frames in new masonry construction shall be solid grouted. Stainless steel or fiberglass shims shall be provided and shall be set tight and rigidly attached between frame anchors and structure. All finished frames shall be strong and rigid, neat in appearance, and square, true, and free of defects, warp or buckle.

C. **Door Installation**: Doors shall be installed plumb and square and level with the frames securely anchored to the adjoining construction. Doors shall operate freely, but not loosely, and shall not bind in operation nor rattle in a closed position.

D. Finish hardware shall be installed in accordance with hardware manufacturer's standard templates and printed instructions. Operable parts shall be adjusted for correct function.

3.2 FINAL ADJUSTMENT

A. **Protection Removal**: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

B. **Final Adjustments**: Check and readjust operating finish hardware items, leaving fiberglass reinforced doors and frames undamaged and in complete and proper operating condition.

** END OF SECTION **