

## Section 083500 – Folding Doors and Grilles

### Part 1 – General

#### 1.1 Related Documents

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 Summary

1. This Section includes four-fold metal doors with surface mounted tube frames and customizable fully glazed panels.
2. Operation of four-fold metal doors includes overhead mounted electro-mechanical operators.

#### 1.3 Submittals

1. Submit each item for review, in accordance with Division 1 Specifications.
2. Shop drawings clearly reflecting door assemblies, hardware, operating components including adjacent construction. Drawings to show elevation, sections, details, and clearances required for the door assemblies.
3. Shop drawings shall be of best quality craftsmanship, specifically prepared on standard size drawing sheet.
4. Complete installation instructions for doors and hardware.
5. Manufacturers technical product data on each product type being utilized.
6. Letter of conformance indicating that the doors are installed in accordance to the drawings and the specifications.
7. Reference list including five (5) successful installations of this type of door within the past two (2) years.

#### 1.4 Quality Assurance:

1. Doors shall be designed to withstand external or internal horizontal wind loads as indicated on structural drawings or in accordance with ASCE. The maximum allowable deflection shall not exceed 1/120 of the span. Fiber stresses in main members shall be limited to 27,000 lbs psi. Sections structural frames shall be designed in accordance with the AISC "Steel Construction Manual".
2. Door manufacturer shall have at least 10 years experience in manufacturing door type specified for applications of similar type.

#### 1.5 Delivery, Storage & Handling

1. Store delivered materials and equipment in dry locations with adequate ventilation, free from dust and water; in such way as to permit access for inspection and handling.
2. Handle materials carefully to prevent damage.

#### 1.6 Warranty

1. Door manufacturer shall provide a written standard limited warranty certificate for material and workmanship.

**PART 2 - PRODUCTS**

**2.1 Manufacturer**

1. Manufacturer: Four-Fold Industrial Metal Door manufactured by Jewers Doors, Ltd. in partnership with Jewers Doors (US), LLC PO Box 16639; Greensboro, NC 27416 (888.510.5331 / www.jewersdoors.us).
2. Product: Phoenix SWIFT Fully Glazed Electrically Operated Four-Fold Door. Model: SWT.FG.E

**2.2 Materials**

1. Steel Tube: ASTM A513 and ASTM A500/A500M
2. Steel Sheets: Steel sheets of commercial quality, complying with ASTM A1011/A1011M hot-rolled steel sheet.
3. Hardware: Manufacturer's standard components.
4. Fasteners: Zinc-coated steel.

**2.3 Four-Fold Doors**

1. Panel Framing: Door panel shall be constructed using cold rolled tubular galvanized steel dovetail channel, using a minimum of 12-gauge structural steel.
2. Sheeting: Portions of panel consisting of solid sections shall be covered, using a minimum of 20-gauge sheet metal. Sheeting shall be formed on vertical edges with no welds visible on interior or exterior faces.
3. Panel Thickness: Panel shall have a nominal thickness of at least 2".
4. **Panel Insulation (Optional on Standard Panels): Internal chambers of solid sections shall be pressure injected with CFC-free polyurethane closed cell foam.**
5. **Raised Panels (Option): Raised panels shall be installed with silicone base gaskets retained on the interior with extruded clear anodized aluminum retainers snapped over concealed retained clips. Visible fasteners on the door face are not acceptable.**
6. **Solid Panels (Option): Internal chambers of solid sections shall be pressure injected with CFC-free polyurethane foam.**
7. Panel & Frame Integrity: Corner joints shall be mitered, and intermediate horizontal members shall be notched, all joints shall be fully welded and ground smooth. Frames shall be true to dimension and square in all directions, and no section shall be bowed, warped, or out of line, in vertical or horizontal plane by more than 1/8" in 20 feet.
8. Surrounding Frame: Jamb frame is included with assembly.
9. **Rear Mounted Frame (Option): Door assembly shall include frame for final finish of rough opening. The frame shall be 6" x 3" RSA goalpost frame and affixed to the rear of the opening. Frame shall be finished to match door assembly.**
10. **Jamb Mounted Frame (Option): Door assembly shall include frame for final finish of rough opening. The frame shall be 8" x 4" RHS goalpost frame and affixed within the jamb of the rough opening. Frame shall be finished to match door assembly.**
11. **Vision Panels (Option): Sections shall receive visions panels in shape and location as indicated in Section 080000. Vision panels shall be constructed using 1" thick hardened safety glass.**

## Section 083500 – Folding Doors and Grilles

12. **Impact Resistant Vision Panels (Option):** Sections shall receive vision panels in shape and location as indicated in Section 080000. Vision panels shall be constructed using 1&7/8" thick laminated glass.
13. **Thermal Efficient Vision Panels (Option):** Sections shall receive vision panels in shape and location as indicated in Section 08 00 00. Vision panels shall be constructed...
14. **Plexiglass Vision Panels (Option):** Sections shall receive vision panels in shape and location as indicated in Section 08 00 00. Vision panels shall be constructed...
15. **Factory Finish:** All exposed steel shall be finished with manufacturers standard factory applied polyester powder coat. Color as selected by Architect from manufacturers range. All hinges and drop bolt sleeves are black powder coat in RAL 9005(M).
16. **Interior Colorcoat® LG Plastisol Finish (Option):** Exterior shall be finished with manufacturers standard factory applied polyester powder coat. Color as selected by Architect from manufacturers range. Interior panel shall be finished using Colorcoat® LG Plastisol as selected from manufacturers range. All hinges and drop bolt sleeves are black powder coat in RAL 9005(M).
17. **Operating Hardware:** All hardware including guide tracks and brackets, trolleys, center guide, not less than three pair of jambs and fold hinges per opening, all bolts, nuts, fasteners, etc. necessary for complete installation and operation shall be included with the assembly.
18. **Anti-Entrapment Adjustable Jamb Hinges:** Each unit shall have no less than 3 laser cut & machined low-profile jamb hinges as to avoid entrapment at the jamb. In open position, hinge shall leave no more than 2" gap between panel and wall. Each hinge shall include a M24 vertical adjustment screw, 5/8" stainless steel hinge pin, and Igus greaseless bushing.
19. **Fold Hinges:** Each unit shall have no less than 2 dual shear hinges at each fold. Hinges shall be bolt-on by nature; not welded as to allow break away and easy replacement in event of failure. Fold hinges shall be machined from solid aluminum extrusions and fitted with bushings and 5/8" stainless steel hinge pins.
20. **Seals:** Assembly shall be fitted with full seals on all edges of door and between panel sections. All seals shall be purposed designed of EPDM rubber extrusions allowing for elasticity at pinch points and avoidance of loss of life and dismemberment of limb. Seals shall be adjustable and easy to replace; providing a minimum level of Class 2 water tightness and air permeability.
21. **Acoustic Value:** Panels shall provide a minimum sound reduction of  $R_{w,p} = 25$  dB.
22. **Energy Efficiency:** Door assembly shall provide acceptable level of energy efficiency; having no greater than a U-Value of 1.75.

### 2.4 Operator

1. Automatic Four-Fold door shall be fitted with overhead electro-mechanical drive unit designed to provide a minimum performance durability level of 110,000 continuous cycles within 60 days. Operator shall be fitted with a low-level release providing for operation during power or motor failure. Manual release shall be easily disengaged and reengaged without requiring a resetting of the operator.
2. Operator shall be instantly reversible, opening and closing rapidly starting and stopping gradually. Operator shall stop with less than 1/4 kN within 6" feet in event of fault trigger.

## Section 083500 – Folding Doors and Grilles

3. Operator shall be concealed by formed hood limiting accidental access to moving components such as gears and limit switches.
4. Electric motor shall be sized sufficiently to operate doors at 75 percent capacity under normal operating conditions. Motor shall be rated for phase and voltage as provided by the electrical drawings.

### 2.5 Controls & Safety Devices

1. All controls and safety devices shall be furnished by door manufacturer and comply with the latest NEMA standards; providing compliance with UL 325 entrapment standards.
2. Motor shall have integrated braking device.
3. Incoming electrical shall be 
4. Manufacturer shall provide control panel with variable speed inverter and programmable control logic (PLC); allowing for a minimum of 42 I/O's programmed via a lid mounted HMI touch screen.
5. If incoming electrical supply is single phase, control panel shall include a variable frequency drive (VFD).
6. All control components shall be housed in a NEMA 4 compliant, 24" x 24" control panel box.
7. Each door shall include a user interface pushbutton station with momentary pressure three button interface marked "OPEN", "STOP" and "CLOSE".
8. Each door shall be equipped with external antenna for remote operation and include a receiver and transmitter key fob remote.
9. Limit switches shall provide for full close and full open positions of the door.
10. Each door shall be equipped with safety devices to ensure full compliance with UL 325. Safety devices include: Lead edge sensor with limited force interface, photo eyes, and travel path detection sensor & entrapment avoidance system.
11. Each door assembly shall have travel path sensors to ensure the path in which the assembly travels during operation is protected from user interface; in addition to standard photo eye assemblies and a presence sensor.
12. Each door assembly shall include a visual detection warning system comprised of a traffic light emitting red during it's operational cycle and green on it's completion. The visual detection shall be configured into the doors control panel.

## PART 3 - EXECUTION

### 3.1 Installation

1. Four-fold door shall be installed in strict accordance with approved drawings by certified installer. Door rough opening shall be prepared by General Contractor prior to installation of door. Rough-in electrical shall be brought to door prior to installation as to avoid installation delays.
2. Slab shall be poured cured and in place prior to installation.
3. Door shall be set plumb, leveled and square with all parts properly fastened and mounted. Door shall be tested and left in good operational order.

## **Section 083500 – Folding Doors and Grilles**

### **3.2 Turnover**

1. Door shall be inspected and operated by installer in presence of General Contractor and / or Architect upon completion of install. Any noted defects shall be corrected and door turned over to General Contractor. Any damage following turnover to General Contractor prior to final turnover to owner, is the responsibility of the General Contractor.
2. OEM Manual & Warranty Certificate will be provided by manufacturer at turnover of door.

**END OF SECTION**