

FF30 SPECIFICATIONS

Performance Series Four-Fold Door System

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes Four-Fold metal doors with surface mounted angle frames. Doors are available for **14'-0" wide x 14'-0" tall or 12'-0" wide x 14'-0" tall openings.**
- B. Operation of Four-Fold metal doors includes overhead mounted electro-mechanical operator.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified consisting of manufacturer's technical Product Data and installation instructions for each type of door required, including data substantiating that products comply with requirements.
- C. Submittal Drawings showing fabrication and installation of Four-Fold metal doors including plans, elevations, sections, details of components, hardware, operating mechanism, and attachments to the other units of Work. Include wiring diagrams for coordination with electrical trade.
- D. Reference list including (5) successful installations of this type of door within the past two (2) years.

1.4 QUALITY ASSURANCE

- A. Doors shall be designed to withstand external or internal horizontal wind loads of up to **130mph (3 second gust) per ASCE 7-16** or up to **25psf (Allowable Stress Design)** and **40psf (Load and Resistance Factor Design)**. The maximum allowable deflection shall not exceed 1/80 of the span. Fiber stresses in main members shall be limited to 27,000 pounds per square inch. Steel frames shall be designed in accordance with the AISC "Steel Construction Manual".

- B. Door manufacturer shall have at least 10 years experience in manufacturing four-fold door systems.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store delivered materials and equipment in dry locations with adequate ventilation, free from dust and water, and so as to permit access for inspection and handling.
- B. Handle materials carefully to prevent damage.

1.6 WARRANTY

- A. The door manufacturer shall provide a written standard limited warranty for material and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Four-Fold industrial metal doors shall be **FF30-Performance Series** manufactured by Door Engineering and Manufacturing, 101 Power Dr, Mankato, MN 56001, (800)-959-1352 or equal products by other manufacturers approved in advance.

2.2 MATERIALS

- A. Steel Tube: ASTM A513 and ASTM A500/A500M
- B. Steel Sheets: Galvannealed sheets of commercial quality, complying with ASTM A653.
- C. Steel Sheets: Aluminum-Zinc Alloy-Coated sheets (Galvalume), complying with ASTM A792.
- D. Hardware: Manufacturer's standard components.
- E. Fasteners: Zinc-coated steel.

2.3 FOUR-FOLD DOORS

- A. Construction: Door framing shall be minimum 14-gauge structural steel tube with 18-gauge galvannealed steel sheet on the exterior and stucco embossed galvalume sheeting on interior faces. Sheeting shall be formed on the vertical edges with no visible welds on the interior or exterior panel faces. All frames and framing members shall be true to dimension and square in all directions, and no door shall be bowed, warped, or out of line, in the vertical or horizontal plane of the door opening by more than 1/8 inch in 20 feet. Exposed welds and welds

which interfere with the installation of various parts shall be ground smooth and flush.

- B. Surface Mounted Frame: Supply angle frame system constructed of minimum L6x4x3/8", designed to anchor to masonry wall construction or fasten/weld to steel structure.

- C. Door Finishes shall be as follows:
 - 1. Exterior sheeting: PPG Spectracron epoxy primer and polyurethane finish. Customer to select from standard RAL colors (excluding metallic colors).
 - 2. Interior sheeting: Polyester PMW4312 USDA White
 - 3. Operator and operating hardware: Powder-coated manufacturer's standard gray.
 - 4. Tracks: galvanized
 - 5. Surface mounted frames: Grey PPG Spectracron epoxy primer.
 - 6. Fasteners: Zinc

- D. Hardware: Hardware shall include guide tracks and brackets, trolleys, center guides, and all bolts, nuts, fasteners, etc. necessary for complete installation and operation.
 - 1. All hardware, including hinges and trolleys, shall be bolted to the panel for easy removal for service or panel replacement.
 - 2. Top tracks shall be adjustable on the end track hangers to allow for adjustment of the door panels in the open position and easily replaceable without removal of the door framing or operators.

- E. Hinges: Jamb hinges shall be dual shear and have two thrust bearings and two needle bearings. Fold hinges shall be stainless steel and be dual shear with two thrust bearings. All bearings shall be completely concealed within the hinge barrel and include grease zerks. All hinge pins shall be minimum 3/4" diameter hardened steel.

- F. Weatherstripping: Material shall be adjustable and readily replaceable and provide a substantially weather-tight installation. Weatherstripping at center shall be 1/16" cloth inserted neoprene and include no exposed fasteners on the exterior face of the panel. Weatherstripping at sill shall include two 1/16" cloth inserted neoprene sweeps with an aluminum retainer. Jambs, Head and fold seals shall be EPDM rubber.

- G. Pinch Points: Provide minimum 3/4" gaps at jambs and fold to conform with UL325 pinch point requirements.

- A. Vision Panels: Provide 1" insulated, tempered, vision panels. Glass shall be Pilkington Energy Advantage low-e. Customer shall choose layout from manufacturer's standard configurations. Glass shall be factory installed and caulked with clear silicone.

- B.

2.4 OPERATOR

- A. Each Four-Fold door shall be operated by an overhead mounted electro-mechanical drive unit designed for high cycle operation. Operator consists of an electric motor, gear reducer, and rotating drive arm. The door shall be operated with connecting rods attached to the rotating drive arm on the operator and to control arms attached to the jamb door section and to the door lintel. The connecting rods shall be positive drive, keeping the door under firm control at all times. The connecting rods shall be fitted with spherical bearings and control arms shall be equipped with oil impregnated bronze bearings on polished shafts.
- B. Operator shall be instantly reversible, open and close rapidly and start and stop gradually. Operator shall be adjustable to allow door to fully clear the opening. Operator shall automatically lock the door in the closed position. Operator shall be equipped with disengaging mechanism to convert to manual operation.
- C. Operator shall include adjustable torque sensing to reverse the door upon resistance from an obstruction.
- D. Electric motor shall be of sufficient size to operate doors under normal operating conditions at no more than 75 percent of rated capacity. The motor shall be wound for three phase 208/230/480 VAC, 60 Hertz operation.
- E. Electric Controls: Controls shall be furnished by the door manufacturer and shall be complete for each door, and built in accordance with the latest NEMA standards. **Incoming electrical shall be (Choose One): 120VAC single phase, 208VAC single phase, 208/230VAC 3-phase, 480VAC 3-phase.**
 - 1. Control panel assemblies shall be UL listed as per NFPA70.
 - 2. Controls shall include a programmable logic controller with digital message display mounted on panel door. Controller shall include programmable close timers and programmable inputs/outputs.
 - 3. Controls shall include a variable frequency drive with independent adjustment of the opening and closing speeds.
 - 4. Enclosures shall be NEMA 4X with disconnect switch.
 - 5. Pushbuttons (interior) for each door shall have one (1) momentary pressure three-button push-button station marked "OPEN", "CLOSE" and "STOP". Push button enclosure shall be NEMA 4.
 - 6. Limit switches shall be provided to stop the travel of the door in its fully open or fully closed position.
 - 7. Safety edges: Provide monitored electric safety edges on leading edge of all doors to reverse door upon contact with obstruction.

8. Photo eyes: Provide (1) exterior, jamb mounted, light Curtain type photo eyes, NEMA 4 rated. Photo eye shall cover from floor level to 72" above floor.
9. Presence Sensor: Provide (1) interior, overhead mounted, presence sensor BEA IS40P or equal.
10. Radio controls: Provide one (1) radio receiver and (1) single button remotes per door. Remotes to open and close doors with single button.
11. Wiring: Door manufacturer shall supply controls and components only. Electrical contractor shall install controls and furnish and install conduits and wiring for jobsite power and control wiring.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install Four-Fold metal doors in strict accordance with the approved drawings by qualified door erection crews. All door openings shall be completely prepared by the general contractor prior to the installation of the doors. Permanent or temporary electric wiring shall be brought to the door opening before installation is started and shall be completed so as not to delay the inspection test.
- B. Doors shall be set plumb, level, and square, and with all parts properly fastened and mounted. All moving parts shall be tested and adjusted and left in good operating condition.

3.2 ADJUSTING AND CLEANING

- A. Inspection of the doors and a complete operating test will be made by the installer in the presence of the general contractor or architect as soon as the erection is complete. Any defects noted shall be corrected. After door approval in the above test, the general contractor must assume the responsibility for any damage or rough handling of the doors during construction until the building is turned over to the owner and final inspection is made.
- B. Clean surfaces and repaint abraded or damaged finished surfaces to match factory-applied finish.

END OF SECTION