



SECTION 08 35 13

FOLDING DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Folding Doors.
- B. Thermally Broken Folding Doors.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: for blocking for framed openings.
- B. Section 03 30 00 – Cast-In-Place Concrete: for block outs for recessed sills and water management systems.
- C. Section 07 62 00 - Flashing and Sheet Metal: for perimeter flashing at openings.
- D. Section 07 92 00 - Sealants: for perimeter sealed joints.
- E. Section 08 80 00 – Glazing: for material requirements for glass and IG/laminated construction.

1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA)
 - 1. AAMA/WDMA/CSA 101/I.S.2/A440-08 (NAFS-08) - Standard/Specification for windows, doors, and unit skylights.
 - 2. AAMA CW-1 0 - Care and Handling of Architectural Aluminum from Shop to Site.
 - 3. AAMA 610.1 - Cleaning and Maintenance of Painted Aluminum Extrusions and Curtain Wall Panels.
 - 4. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
 - 5. AAMA 1303 - Voluntary Specifications for Forced-Entry Resistant Aluminum sliding Glass Doors.
 - 6. AAMA 2604 – Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

7. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels.
- B. American National Standards Institute (ANSI):
1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- C. ASTM International (ASTM):
1. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 2. ASTM C 1115 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 3. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 4. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 5. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 6. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls, and Doors.
 7. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
 8. ASTM E 1996: "Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes".

1.4 ACTION SUBMITTALS

- A. Submit in accordance with requirements of Section 01 30 00 - Administrative Requirements.
- B. Product Data:
1. Manufacturer's technical product data, including component descriptions, construction details, and test results showing compliance with specified performance criteria.
 2. Manufacturer's surface preparation and installation instructions.
 3. Safety Data Sheets (SDS).
 4. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 5. Include rated capacities, operating characteristics, and furnished specialties and accessories.

- C. Shop Drawings: Detailed drawings prepared specifically for the project by manufacturer. Show opening dimensions, framed opening tolerances, profiles, product components, anchorages, and accessories.
 - 1. Indicate material thickness, fastener locations, glazing and hardware arrangements.
 - 2. Include schedule identifying each unit, with marks or numbers referencing drawings.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples:
 - 1. Aluminum Finish: Two samples, minimum size 2 by 3 inches (50 by 75 mm), representing actual product and color.
 - 2. Glass: Two samples, minimum size 12 inches (300 mm) square, of specified glass, including coatings or frit pattern.
 - 3. Assembly Sample: 24 by 36 inches (600 by 900 mm) assembly complete with glazing, gaskets, fasteners, anchors, and finish; do not proceed with fabrication until workmanship and color are approved by Architect.

1.5 INFORMATIONAL SUBMITTALS

- A. Sustainability Submittals:
 - 1. Refer to Section 01 81 13 – Sustainable Design Requirements.
- B. Qualification Data: For [Installer][manufacturer][testing agency][factory-authorized service representative].

1.6 CLOSEOUT SUBMITTALS

- A. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- B. Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment and periodic cleaning and maintenance of all components
- C. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section with minimum 10 years' experience in fabrication and erection of glazed window wall systems for projects of similar scope.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

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- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
- D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
 - 1. Intent of mock-up is to demonstrate quality of workmanship, visual appearance and operation.
 - 2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 - 3. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 4. Refinish mock-up area as required to produce acceptable work.
 - 5. Retain mock-up during construction as a standard for comparison with completed work.
 - 6. Incorporate accepted mock-up as part of the Work.

1.8 PRE-INSTALLATION CONFERENCE

- A. Pre-installation Conference: Conduct conference at [Project site]<Insert location>.
- B. Convene a conference approximately [two weeks]< **insert timing**> before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Provide care and handling conforming to AAMA CW-10, "Care and Handling of Architectural Aluminum from Shop to Site".
- C. Store products out of contact with the ground, under a weather tight covering, so as to prevent bending, warping, or other damage. Do not cover with unventilated tarps, polyethylene film, or similar coverings.
- D. Protect factory finishes from damage, precipitation and construction materials until ready for installation.

1.10 PROJECT CONDITIONS

- A. Schedule work around the ambient conditions required by the manufacturer. Do not perform work outside manufacturer's recommended limits for environmental conditions.

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- B. Prior to fabrication, verify that dimensions are consistent with those found in the construction drawings. Where discrepancies exist, confirm the proper dimensions with the Architect before proceeding with work.

1.11 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.12 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of door and window products that fail(s) in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 10 year(s) from date of Substantial Completion.
 - 2. Refer to manufacturer for reduced warranty periods on products and finishes in coastal and salt water environments.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: Euro-Wall, LLC
 - 1. Address: 2200 Murphy Court, North Port, Florida 34289
 - 2. Phone Toll Free: 888-989-EURO (3876).
 - 3. Fax: 941-867-4421.
 - 4. Website: www.euro-wall.com.
 - 5. Email: info@euro-wall.com
- B. N.A.M.I. Quality Assurance compliant # 1884-1. ISO/IEC 17020 & Guide 53. State of Florida QUA 1789.
- C. Substitution Limitations:
 - 1. Submit substitution requests in accordance with provisions of Section 01 60 00.
 - 2. Single manufacturer to provide, from a single source, primary products and accessories specified in this section.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS

- A. System Design: Design and size components to withstand dead and live loads caused by pressure and suction of wind acting normal to plane of folding glass wall as calculated in accordance with applicable code.

- B. Physical Performance requirement.
 - 1. Outward/Inward.
 - a. AAMA / WDMA / CSA 101 / I.S.2 / A440-08 (NAFS-08): Pass.
 - b. AAMA / WDMA / CSA 101 / I.S.2 / A440-08 (NAFS-08), Air infiltration: A2,
 - c. Water Leakage Resistance: DP75/PG75.
 - d. Wind Load Resistance: DP100.
- C. Standards Compliance:
 - 1. The Euro-Wall Door is designed and manufactured to comply with the current Florida Building Code (FBC) including HVHZ and has been evaluated to the following:
 - a. TAS 201-94 (ASTM E1996-03) Large missile impacts
 - b. TAS 202-94 (ASTM E330-02) Uniform static pressure
 - c. TAS 203-94 (ASTM E1886-02) Positive and negative cycle loads
 - d. ASTM E283 Air infiltration
 - e. ASTM E331-00 Water infiltration
 - f. AAMA 1303-05 Forced entry
- D. Environmental Performance requirement.
 - 1. HVHZ maximum approved:
 - 2. DP up to 100: Panel height up to **144 inches (3657 mm)** Panel width up to **53 inches (1348 mm)**.
 - 3. WZ3 maximum approved:
 - 4. DP up to 100: Panel height up to **168 inches (4267 mm)** Panel width up to **52 inches (1321 mm)**.

2.3 ALUMINUM FOLDING DOORS

- A. Provide top hung sliding/folding glass doors to fit the openings and configurations indicated on the Drawings. Provide system complete with head, sill and jambs complete with weatherstripping, operating hardware and specified accessories as follows:
 - 1. System: Euro-Wall, LLC Euro-C2 Aluminum Non-Impact Resistant folding door system as manufactured by Euro-Wall, LLC.
 - 2. System: Euro-Wall, LLC Euro-C3 Aluminum Impact Resistant folding doors system as manufactured by Euro-Wall, LLC
 - 3. Door Panel Size: Provide doors as a factory fabricated knock-down system.
 - a. As indicated on the Drawings.
 - b. Provide applied muntins design as indicated.
 - 4. Operation: Out-folding system.
 - 5. Operation: In-folding system.
 - 6. Door Panel Size: Provide doors as a factory fabricated knock-down system.
 - 7. Accessory Profiles. Aluminum extrusions as required or indicated to complete the system design intent.

8. Track: [top mounted][Half embed][Full embed][As indicated on Drawings].
9. Water Management System: Provide independent active water management system with track inlets and piped discharge outlet.
10. Configuration: As indicated on the Drawings.

2.4 ALUMINUM THERMALLY BROKEN FOLDING DOORS

- A. Provide thermally broken top hung sliding/folding glass doors to fit the openings and configurations indicated on the Drawings. Provide system complete with head, sill and jambs with weatherstripping, operating hardware and specified accessories as follows:
 1. System: Euro-Wall, LLC Euro-C5 Thermally Broken Aluminum Folding Systems as manufactured by Euro-Wall, LLC.
 2. Door Panel Size: Provide doors as a factory fabricated knock-down system.
 - a. As indicated on the Drawings.
 3. Operation: Out-folding system.
 4. Operation: In-folding system.
- B. Construction: Thermally-broke sections and sill. Interior isolation from exterior with pour and debridge method at recessed stile, multi-point stile, rail, jamb and header.
- C. Thermal NFRC testing (simulation) 1 inch IG glass (LowE 366 @ I89) .32 to .50 U-Factor, SHGC < .19
 1. ASTM E 330, Procedure A: Uniform Load Structural: PG 50+/- (2400 Pa/ 50 psf).
 2. AAMA / WDMA / CSA 101 / I.S.2 / A440-08 (NAFS-08), Air infiltration: A3,
 3. Water Leakage Resistance: DP50 (510 PA), Wind Load Resistance
 4. Design Pressure: 3360 Pa (71 psf), ASTM E 330, Procedure A.
 5. Negative Design Pressure: 50 DP- ASTM E 330, Procedure A.
 6. Water Penetration Resistance: 510 Pa (10.5 psf), ASTM E 547.
 7. Air Leakage Resistance: A2 (NAFS-08)
- D. Outward/Inward opening Euro-C5 Thermally Broken Aluminum Folding Door system when tested on a typical four panel folding door unit (3L3R), 252 inches (6400.8 mm) in width and 120 inches (3048 mm) in height shall meet or exceed the following performance tests.
 1. ASTM E 1886: 10 Large Missile Impact Shots: Not Tested
 2. ASTM E 1996: 9000 Air Pressure Cycles (Positive/ Negative): 50 Psf (2400 Pa).
 3. ASTM E 330, Procedure A: Uniform Load Structural: DP50. (2400 Pa/ 50 psf).
 4. AAMA / WDMA / CSA 101 / I.S.2 / A440-08 (NAFS-08), Air infiltration: A3,
 5. Water Leakage Resistance: DP50, Wind Load Resistance: DP50 (2400 PA).
 6. Design Pressure: 2400 Pa (50 psf), ASTM E 330, Procedure A.
 7. Negative Design Pressure: 2400 Pa (50 psf), ASTM E 330, Procedure A.
 8. Water Penetration Resistance: 510 Pa (10.5 psf), ASTM E 547.

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9. Leakage Resistance: A2 (NAFS-08)
10. TAS 201 TAS 202 TAS 203, Not Tested

2.5 MATERIALS

- A. Aluminum: 6063-T5 alloy and temper. Other alloys and tempers may be used for non-structural members provided they do not void the required warranties. Indicate alloys and tempers clearly on shop drawings and in structural calculations.
 1. Framing: Extruded aluminum with nominal thickness of .078 inches (2.0 mm) to .1562 inches (4mm).
- B. Flashings: Sheet aluminum, same finish as for system components; secured with concealed fastening method or fastener with head finished to match; thickness as required for conditions encountered.
- C. Anchors and Fasteners: Aluminum, zinc and stainless steel of type, which will not cause electrolytic action or corrosion.
- D. Weatherstripping:
 1. Dual weatherstripping on head, jambs and between panels, and single weatherstripping on sill.
 2. Hinge gaskets on specific hinges per product.
- E. Sill:
 1. Profile: Interior.
 2. Profile: Standard.
 3. Profile: Modified Standard.
 4. Profile: Modified Standard (thermally-broke).
 1. Profile: ADA compliant sill.
 2. Profile: ADA compliant sill (thermally-broke).
- F. Accessories: Required for installation. Provided by installer.
 1. Moldings as indicated or required.
 2. Sill Cover as indicated or required.
 3. Sill pan as indicated or required.

2.6 HARDWARE

- A. Hardware:
 1. Aluminum hinges, color as follows: [White Powder Coat][Clear Anodized][Bronze Powder Coat][Black Powder Coat].
 2. Stainless steel corrosion resistant carriers with sealed, self-lubrication, ball bearing multi-rollers.
 3. Twinpoint stainless steel Handle and Gear Box.
 4. Multipoint stainless steel door lock system.

- B. Door Handles:
 - 1. Ferraro Series: Finish: [White powder coat finish][Satin aluminum finish][Black powder coat finish][Bronze powder coat finish].
 - 2. Florence Series: Finish: [Satin nickel finish][Polished Brass finish][Bronze Powder coat finish][Antique Brass finish][Antique nickel finish].
 - 3. Faenza Series: Finish: [Satin nickel finish][Polished Brass finish][Bronze Powder coat finish][Antique Brass finish][Antique nickel finish].
- C. ADA Emergency Egress:
 - 1. Paired interior panic bar with exterior handle sets.

2.7 FINISH

- A. Aluminum Finish: Anodized Class 1 complying with AAMA 611 Class 1 Acid Etch anodic coatings.
 - 1. Color: [Clear].
- B. Aluminum Finish: Standard mill finish with custom finish as follows:
 - 1. Powder Coat Finish: Kynar 70% finish - D2000-AAMA 2605. 20 year manufacturer's warranty. Color as selected from manufacturer's standard colors.
 - a. Color: [White][Bronze][Black][Sunstorm Arcadia Silver].
 - 2. Custom Powder Coat finishes available D3000-AAMA 2605. 10 year manufacturer's warranty. Color as selected from manufacturer's standard colors.
 - 3. Custom Powder Coat finishes available D3000-AAMA 2604. 5 year manufacturer's warranty. Color as selected from manufacturer's standard colors.
 - 4. Interior/Exterior Faux Wood Grain: Paint finish complying with D3000-AAMA 2604. 5 year manufacturer's warranty.
 - a. Species Look: [Dark Walnut][Dark Walnut][Mahogany Red][Natura][Burlwood][English Oak][Teak][Chestnut Cherry][Hazelnut Brown][Walnut Brown][Cinnamon Red][Honey Pine].
- C. Wood Grain Interior Finishes (Standard): [Mahogany/Sapele][White oak].
- D. Wood Grain Interior Finishes (Exotic): [African Rosewood][Ash][Birch][Curly Maple][Red Oak][Walnut][Zebrawood].

2.8 GLAZING

- A. Glazing: Provide glazing type specified complying with ANSI Z97.1.
- B. Glazing: Provide glazing type specified complying with Section 08 80 00 – Glazing.
- C. Glazing:
 - 1. Construction: 1/4 inch (6 mm) tempered monolithic glass.

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2. Construction: 3/8 inch (9.5 mm) tempered monolithic glass.
 3. Construction: 9/16 inch (14 mm) laminated impact glass.
 4. Construction: 1/2 inch (12.5 mm) laminated glass.
 5. Construction: 1/2 inch (12.5 mm) tempered monolithic glass.
 6. Construction: 1 inch (24 mm) Sealed Insulating Glass.
 7. Construction: 1 inch (24 mm) Sealed Insulating Impact Glass.
- D. Glazing Gaskets: Dry glazing system compression type design, replaceable; EPDM, complying with ASTM C 864, with solid strand cord to prevent shrinkage or; Elastomeric silicone with solid strand cord to prevent shrinkage, complying with ASTM C 1115, as provided by the manufacturer.
1. Manufacturer's standard wedge gaskets black color.
 2. Wet glazing on oversized panels.
- E. Setting Blocks, Edge Blocks, and Spacers: As required by manufacturer and compatible with insulated glass where required.

2.9 FABRICATION

- A. Fabricate components in accordance with approved shop drawings. Remove burrs and rough edges. Shop fabricate to greatest extent practicable to minimize field cutting, splicing, and assembly.
- B. Fabricate components true to detail and free from defects impairing appearance, strength or durability.
- C. Fabricate components to allow for accurate and rigid fit of joints and corners. Match components carefully ensuring continuity of line and design. Ensure joints and connections will be flush and weathertight. Ensure slip joints make full, tight contact and are weathertight.
- D. Reinforce components at anchorage and support points, at joints, and at attachment points for interfacing work. Door panel corner key for strength and security.
- E. Glass: Accurately size glass to fit openings allowing clearances following recommendations of the manufacturer.
- F. Cut glass clean and carefully. Nicks and damaged edges will not be accepted. Replace glass that has damaged edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.

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- B. Verify openings are ready to receive work and dimensions and clearances are as indicated on the approved shop drawings.
- C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Provide a sill pan for all door installations.
- D. Install water management sill drainage tubes if water management system required.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install system in accordance with approved shop drawings and manufacturer's instructions.
- C. Install components level, plumb and true to line with uniform joints. Do not use defective parts that are warped, twisted, bowed, dented or abraded.
- D. Moving Panels: Never "walk panels" and never try to move panels with only one person. Always lift and move panels by hand or using glass suction cups using at least two people. For panels less than 8 feet in height, use a minimum of two installers. For panels over 8 feet (2438 mm) tall, a team of four is recommend for the install.
- E. Separate dissimilar materials using nonconductive tape, paint, or other material not visible in finished work.
- F. Provide attachments and shims to permanently fasten system to building structure. Refer to manufacturer's ANCHOR SCHEDULE for required anchor type, embed and performance.
- G. Maintain dimensional tolerances and alignment with adjacent Work.
- H. Anchor securely in place, allowing for required movement, including expansion and contraction.
- I. Install glazing and sealants in accordance with manufacturer's instructions without exception, including surface preparations.

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- J. Set sill members in bed of sealant. Set other members with internal sealants to provide weathertight construction.
- K. Install flashings, closures, corners, and other accessories as required or detailed.
- L. Clean surfaces and install sealant in accordance with sealant manufacturer's instructions and structure manufacturer's guidelines.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
- B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.5 ADJUSTING AND CLEANING

- A. Adjust hinge sets, locksets, and other hardware for proper operation. Lubricate using a suitable lubricant compatible with door and frame coatings.
- B. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions before owner's acceptance.
- C. Clean and maintain aluminum surfaces in accordance with AAMA 610.1.
- D. Remove from project site and legally dispose of construction debris associated with this work.

3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

3.7 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturer's recommendations.
 - 1. Remove all protective film from panels, frames and any other metal extrusion within 30 days of job delivery. Failure to do so could cause finish damage voiding the product warranty.
 - 2. Locks and Hardware: Wipe down the visible surfaces with warm soapy water on a soft cloth and then rinse off by wiping with a clean damp cloth. Spray a thin film of light machine oil or one of the corrosion preventative sprays.
 - 3. Track and Bearings: Apply white petroleum jelly (Vaseline) or equivalent, to inner lip of each side of head track with a clean cloth. Distribute lubricant evenly along track. Ensure wheels and bearings receive sufficient lubricant.

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4. Hangers, Pivots and Brackets: Before applying anti-corrosive substance, wipe exposed surfaces with clean soft cloth soaked in warm soapy water; then rinse, clean and dry. Spray thin film to hangers, pivots and brackets with anti-corrosive treatment.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. Owner Routine Maintenance: Regular maintenance is required for all hardware, even stainless steel, to keep manufacturer's warranty in place. Failure to provide proof of maintenance will void any warranty.
 1. Carry out maintenance procedures with the following minimum recommendations:
 - a. General environments - every 3 months.
 - b. Marine, industrial environments, within 5 miles of a body of water and / or a pool area - every month.

END OF SECTION