

**NON-PROPRIETARY GUIDE SPECIFICATION FOR SECTION
08210 – STILE AND RAIL WOOD DOORS**

SECTION 08210 – STILE AND RAIL WOOD DOORS

Part 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1–Specification sections, apply to work specified in this Section.

1.2 REFERENCE STANDARDS (most recent edition)

- A. WDMA I.S. 6A - Window and Door Manufacturers Association (WDMA)
- B. AWS - Quality Standards of the Architectural Woodwork Institute (AWI). Section 9, Stile and Rail doors.
- C. NFPA 80 - Fire Doors and Windows
- D. NFPA 252 - Standard Methods of Fire Tests for Door Assemblies
- E. Underwriters' Laboratories - UL 10B (neutral pressure) and UL 10C (positive pressure) - Fire Tests of Door Assemblies
- F. ITS (Warnock Hersey) - Certification Listings for Fire Doors

1.3 SUMMARY

This section includes:

- A. Stile and Rail wood doors with wood-veneer or paint-grade faces.
- B. Factory pre-fitting, pre-machining for hardware, detailing, and factory prefinishing.

1.4 SUBMITTALS

- A. Product Data: Submit door manufacturer's product construction data, hardware attachment performance data, specifications and installation instructions for each type of wood door, including details of core, raised panel and edge construction, trim for lite openings and similar components.
- B. Specific Product Warranty: The door shall be warranted by the manufacturer to be free of manufacturing defects for the life of the original, interior-use, installation. Warranty shall provide for repair or replacement of the door as originally furnished. Manufacturer shall elect to repair or replace defective door(s), and will assume reasonable costs associated with same. Manufacturer may, per its discretion, elect to use either its own or third party resources to resolve warranty claims.

C. Shop Drawings: Provide the following information:

- 1) Door type.
- 2) Door size.
- 3) Fire Rating.
 - a) Neutral pressure - UL 10B/UBC-43-2 or UBC- 7-2-94.
 - b) Positive pressure - UL 10C/UBC-7-2-97.
- 4) Hardware types and locations.
- 5) Panel Configuration
- 6) Lite opening size and location.
- 7) Prefinish system type and approved color(s).

D. Samples:

- 1) Color samples for factory prefinishing. Manufacturer must submit samples of not less than 4" x 6" size on representative veneer or paintable surface, with sample date indicated.
- 2) Construction samples. Corner sections with door faces, raised panels, sticking profile, edges, and core representative of the specified door type(s). Corner samples to be not less than 12" x 12".

1.5 QUALITY ASSURANCE

- A. **Manufacturer:** Company specializing in manufacturing products specified in Section 08210 with a minimum of five years documented experience. All doors must be supplied through one Company.
- B. **Quality Standard:** Doors to comply with WDMA I.S. 6A (Window and Door Manufacturers Association).
- C. **Fire Ratings Compliance:** Fire-rated wood doors to comply with building code standards having local jurisdiction. Doors to be installed in accordance with NFPA-80.
 - 1) Neutral Pressure Testing - UBC 43-2 or UBC-7-2-94; or UL10B.
 - 2) Positive Pressure Testing UBC 7-2-97 or UL10C.
- D. **Label Certification:** All doors requiring fire-rating will carry either UL or ITS (Warnock Hersey) label. Manufacturer's certification labels may be used for door size variations if approved by AHJ (Authority Having Jurisdiction).
- F. **Delivery/Storage/Handling:** Store and protect doors in accordance with manufacturer's recommendations and WDMA. Following are general guidelines. For more specific information refer to WDMA's Appendix Section "Care and Installation at Job Site."
 - 1) Store doors flat and off the floor on a level surface in a dry, well-ventilated building. Do not store on edge. Protect doors from dirt, water and abuse.
 - 2) Certain wood species are light sensitive. Protect doors from exposure to light (artificial or natural) after delivery.
 - 3) Do not subject interior doors to extremes in either heat or humidity. HVAC systems should be operational and balanced, providing a temperature range of 50 to 80 degrees Fahrenheit and 25% to 55% relative humidity.
 - 4) When handling doors, always lift and carry. Do not drag across other doors or surfaces. Handle with clean hands or gloves.
 - 5) Each door will be marked on top rail with opening number.

1.6 WARRANTY

Manufacturer's signed warranty covering manufacturing or material defects for life of original installation, including repair, replacement, machining, detailing and/or prefinishing, is a required part of the manufacturer's warranty for interior doors. Exterior applications per manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Manufacturers are subject to evaluation and inclusion by architect/specifier. Listed below are primary manufacturers of architectural stile and rail wood doors:

Algoma Hardwoods, Inc.
Eggers Industries
Industrial Millwork / Lag Design
The Maiman Company
Woodtech

2.2 DOOR CONSTRUCTION, GENERAL

A. NON-FIRE-RATED DOORS –

General Grade Specification – Refer to WDMA I.S. 6A for more specific grade definitions.

Premium - The highest grade commercially available in both material and workmanship. Intended for the finest commercial, industrial and institutional buildings.

Custom - The typical and normal grade in both material and workmanship. This grade is intended for high-quality work.

Grade Specified: [Click Here for Door Grade](#)

- 1) Construct using WDMA I.S. 6A construction, using Hot Press method for laminating door materials. Door construction of stiles and rails must include crossbanding between core material and face veneers. Edge banding and sticking profile must be solid lumber (veneered profile is not acceptable). Select construction (refer to Section (2) for specific information).
- 2) Core material for Stile and Rail Components
 - a) **Structural Composite Lumber Core (SCLC)** is an engineered hardwood composite sometimes referred to as LSL (Laminated Strand Lumber). The material complies with WDMA minimum performance levels for interior applications with screw holding power of 540 lbs., average modulus of rupture of 4,000 psi, average modulus of elasticity of 600,000 psi and density of 38 lbs per cubic foot.
 - b) **Stave Lumber Core (SLC)** may be a combination of solid, low-density lumber blocks or strips not more than 2-1/2" wide of one species of wood between 6% to 9% moisture content. Joints to be tight and staggered in adjacent rows. Lumber density is 25 to 27 lbs. per cubic foot.

Core Materials Specified: [Click Here for Core Type](#)

- 3) **Stiles (Vertical Edges)** - Stiles are hardwood, one piece.
 a) **Compatible** - Similar in overall color, grain, character and contrast as the face veneer
 b) **Matching** - Same species as face veneer.
 c) **Closed Grain Hardwood** - Manufacturer's option for painted stile edges.

Stile Type Specified: [Click Here for Stile Type](#)

4. **Rails (Horizontal Edges)** - Rails are low density lumber or structural composite lumber (SCL) as specified in core section. SCL must meet the minimum requirements of WDMA.
- 5) **Veneers** - There are three aspects of veneer selection which must be specified. The aspects are (1) face grade, (2) cut, and (3) veneer species. Veneers must be a minimum of 1/16" thick.

Veneer Grade Specified: [Click Here for Veneer Grade](#)

Veneer Cut Specified: [Click Here for Veneer Cut](#)

Veneer Species Specified: [Click Here for Veneer Species](#)

Veneer Match Specified: [Click Here for Veneer Match](#)

Veneer Assembly Specified: [Click Here for Veneer Assembly](#)

6. **Assembly of Stile and Rail Components** – Stiles, rails, and mullions must be joined with both ½" wooden dowels and cope and stick joints and bonded with glue. Doweled butt joints or cope and stick only joints are not allowed.
- 7) **Transom and Side Panels** — Fabricate units with same construction, exposed surfaces, and finish specified for associated doors.
- 8) **Panel Construction** — There are three primary panel constructions for architectural stile and rail wood doors. They are veneered profiled panels, rim raised lumber banded panels, and flat panels. Veneered profile panels are considered the standard while the rim raised lumber banded panels are available at an additional charge.

Panel Type Specified: [Click Here for Raised Panel Construction Type](#)

- 9) **Panel Thickness** - Minimum panel thickness is required for raised and flat panels. Minimum thickness as listed based on door thickness.

| | | | |
|----------------------------|--------|--------|--------|
| Door Thickness | 1-3/8" | 1-3/4" | 2-1/4" |
| Flat Panel | 1/4" | 1/2" | 5/8" |
| Veneer Profiled Panel | 3/4" | 1-1/8" | 1-1/8" |
| Lumber Banded Raised Panel | 3/4" | 1-1/8" | 1-1/2" |

B. FIRE-RATED STILE AND RAIL DOORS

- 1) **General Grade Specification** – Refer to WDMA IS 6A for more specific grade definitions.

Premium - The highest grade commercially available in both material and workmanship. Intended for the finest commercial, industrial and institutional buildings.

Custom - The typical and normal grade in both material and workmanship. This grade is intended for high-quality work.

Grade Specified: [Click for Door Grade](#)

- 2) Construct using WDMA I.S. 6A construction, using Hot Press method for laminating door materials. Door construction of stiles and rails must include crossbanding between core material and face veneers. Edge banding and sticking profile must be solid lumber (veneered profile is not acceptable). Construct using WDMA hot press method for laminating door materials. Select construction (refer to Section (2) for specific information). 45, 60 & 90 minute construction per manufacturers labeling approval.
- 3) Core is one of the following three types which is determined by the fire rating specified and the manufacturers specific approvals:
- Stave Lumber Core** may be a combination of solid, low-density hardwood lumber blocks or strips not more than 2-1/2" wide of one species of wood at 6% to 9% moisture content. Joints to be tight and staggered in adjacent rows. Lumber density is 25 to 27 lbs. per cubic foot. For use only with 1/3 hour rated doors.
 - Structural Composite Lumber Core** is an engineered hardwood composite sometimes referred to as LSL (Laminated Strand Lumber). The material complies with WDMA minimum performance levels for interior applications with screw holding power of 540 lbs., average modulus of rupture of 4,000 psi, average modulus of elasticity of 600,000 psi and density of 38 lbs per cubic foot. For use only with 1/3 hour rated doors.
 - Core and Edge Constructions** that utilize non-combustible mineral composite materials and intumescent materials that are necessary for 3/4, 1, and 1 1/2 hour ratings per manufacturer's approval(s).

Designate if rated stile and rail fire doors are required:

Fire Rating Specified: [Click Here if Rated Fire Doors are Required](#)

- 4) **Neutral and Positive Pressure Fire Doors** – Based on changes in the International Council of Building Officials (ICBO) standards and the Uniform Building Code (UBC), some states and/or municipalities may require positive pressure approved openings. This is identified by requirements to meet UBC 7.2-1997 and/or UL10C. Neutral or positive pressure must be specified, as well as the positive pressure category type. Identify requirements below.
- a) **Neutral Pressure** openings as required prior by UBC prior to adoption of positive pressure requirements.
 - b) **Category A Positive Pressure** openings have all the intumescent required for compliance contained within the door, are not visible on the door edge and require no additional installation of intumescent strips.
 - c) **Category B Positive Pressure** openings require the addition of intumescent strips to the door and/or frame.

Neutral/Positive Pressure Specified: [Click Here for Neutral or Positive Pressure](#)

- 5) **Crossbands** Crossbands and face veneers are laminated to the core with Type 1 interior glue using the Hot Press process. Minimum properties include internal bond 100 psi and density of 50 lbs. per cubic foot.
- 6) **Stiles (Vertical Edges)** - Provide manufacturer's standard edge construction with improved screw-holding capability and split resistance which comply with fire ratings required. Select outer stile edge below.
- a) **Compatible** - Similar in overall color, grain, character and contrast as the face veneer.
 - b) **Matching** - Same species as face veneer.
 - c) **Closed Grain Hardwood** - Manufacturer's option for painted stile edges.

Stile Type Specified: [Click Here for Stile Type](#)

- 7) **Rails (Horizontal Edges)** - Rails are solid wood or other material contained in manufacturer's fire door approvals.
- 8) **Veneers** - There are three aspects of veneer selection which must be specified. The aspects are (1) face grade, (2) cut, and (3) veneer species. Veneers must be a minimum of 1/16" thick.

Veneer GRADE Specified: [Click Here for Veneer Grade](#)

Veneer CUT Specified: [Click Here for Veneer Cut](#)

Veneer SPECIES Specified: [Click Here for Veneer Species](#)

- 9) **Raised Panel Construction** – There are three primary panel constructions for fire rated architectural stile and rail wood doors. They are veneered profiled panels, rim raised lumber banded and flat panels. Veneered profile panels are considered the standard while the lumber banded panels are available at an additional charge. Utilize panel type based on manufacturers fire rated constructions.
- 10) **Panel Thickness (20 minute)** - Minimum panel thickness is required for raised and flat panels. Minimum thickness as listed based on door thickness. 45, 60 & 90 minute panel thickness per manufacturers labeling approval.

| | | |
|------------------------------|---------------|---------------|
| Door Thickness | <u>1-3/4"</u> | <u>2-1/4"</u> |
| Flat Panel | 1/2" | 5/8" |
| Veneer Profiled Raised Panel | 1-1/8" | 1-1/8" |
| Rim-Banded Raised Panel | 1-1/8" | 1-1/2" |

- 10) **Transom and Side Panels** — Fabricate panels with same construction, exposed surfaces, and finish specified for associated doors.

2.3 DOOR FABRICATION

A. FACTORY-PREFIT AND BEVEL DOORS (3°) to suit frame sizes indicated, with 1/4" prefit in width, + 0"/- 1/32", tolerances. Prefit top of door 1/8" +1/16"/-0", and undercut as designated by floor condition. For fire-rated doors comply with NFPA 80 for prefits and undercuts.

B. FACTORY PRE-MACHINE DOORS FOR HARDWARE that is not surface applied. Locations and hole patterns to comply with specified hardware requirements as per NFPA 80 standards for doors specified; and to maintain door manufacturer's warranty.

- 1) Specific locations for hardware will be coordinated between frame and door manufacturers.
- 2) Specific hardware preps will be per hardware schedule(s) provided. Hardware preps to be neatly and cleanly squared as required per hardware templates.
- 3) Metal astragals and channels to be supplied where fire-ratings will not allow metal-free edge(s).

C. FACTORY PREPARATION FOR LIGHT OPENINGS AND LOUVERS - Cut and trim openings through doors to comply with NFPA 80 requirements where indicated, and to maintain door manufacturer's warranty.

- 1) Wood beads and wood louvers to be compatible with face veneer. Profiles and installation per door manufacturer's standard(s).

2.4 FACTORY FINISHING

A. FINISH LOCATION

- 1) **Factory Finishing** – All doors (including beading and mouldings) to be finished at the factory, with system meeting performance properties equivalent to AWS system 11 catalyzed polyurethane per AWS Section 5. Factory pre-finished doors to be individually protected with either transparent or opaque (cherry, mahogany, teak, walnut) poly-wrap at the factory. Final color, build, and sheen to be approved by architect based on actual review samples.
- 2) **Field Finishing** – All doors (including beading and mouldings) to be field finished. Proper procedures are critical to ensure satisfactory results. Additional preparatory work is required and should be in compliance with WDMA Industry Standards IS 6A. (For additional information see WDMA Publication How To Store, Handle, Finish, Install and Maintain Wood Doors.) Also refer to Division 9–Finishes, for this project, to ensure proper compliance with finishing requirements. Final appearance of field finished doors is not warranted by the door manufacturer.

Finish Location Specified: [Click Here for Finish Location](#)

B. FINISH TYPE

- 1) **Transparent** - Transparent finishes provide a clear protective coating over the wood, allowing the natural color and grain of the selected wood species to provide the appearance desired by the specifier and owner. Stain is often applied to the wood surface underneath the transparent clear finish to add more color and design flexibility.
- 2) **Opaque** - Opaque finishes are essentially solid colors used over paint grade veneers.
- 3) **Factory Priming** - A solid color priming coat for doors that will be painted a solid color in the field.

Finish Type Specified: [Click Here for Finish Type](#)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm that frames comply with type, size, location and swing requirements and that they are installed plumb and square.
- B. Inspect doors for any damage, manufacturing defects or prefinish inconsistency, e.g. wrong color or poor finish.
- C. If frames and doors pass inspections (see A and B above), proceed to installation. If there are any issues in either frames or doors, do not proceed to installation. Contact appropriate supplier to correct unsatisfactory conditions, and proceed with installation only after corrections have been made.

3.2 INSTALLATION

Installation of wood doors to comply with WDMA IS 1A, specific door manufacturers specific instructions, and NFPA 80.

3.3 ADJUSTING AND PROTECTING

- A. After installation of door in frame, operate door to ensure that the door swings freely and that all hardware functions correctly. If not, make adjustments as required to provide an operable opening.
- B. If required, protect doors following installation from damage that may occur as a result of project completion.

END OF SECTION 08210