



Specification Section 08210, Wood Doors

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This document has undergone formal review and approval and been reviewed by a Derivative Classifier and its contents have been deemed unclassified/unlimited release.



**Sandia
National
Laboratories**



U.S. DEPARTMENT OF
ENERGY



WOOD DOORS

NOTE This guide section can be used for specifying fire-rated and non-rated, interior, flush, solid core, wood doors for construction projects at Sandia National Laboratories (SNL). Exterior and hollow core wood doors are not used for SNL projects. The specifier will need to edit this section for a specific project to reflect the options and applications being used. The guide section has been written so that most editing can be accomplished by deleting unnecessary requirements and options. Depending on project requirements, some additional information will need to be added by the specifier. Options are indicated by [].

NOTE For final editing, all brackets and notes will need to be deleted from the guide, and this specification will need to be made into a Construction Special Specification.

Throughout this product guide specification, references are made to other specification sections that might be contained in the project manual. These references are presented as examples and coordination reminders.

CONSTRUCTION MASTER SPECIFICATION

SECTION 08210

WOOD DOORS

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PART 1 – GENERAL

1.01 SUMMARY

NOTE Edit the following to reflect type of wood doors required for project.

- A. Section includes: [Non-rated] and [fire-rated], interior, solid core, and flush doors with [wood veneer], [hardboard] face, [including [transom panels], [vision lights, and louvers]].

NOTE List other specification sections dealing with work directly related to this section such as the following.

1. Section 08110, *Steel Doors and Frames*: Hollow steel frames for wood doors.
 2. Section 08710, *Door Hardware*: Hardware for wood doors.
 3. Section 08800, *Glazing*: Glazing for vision lights.
 4. Section 09900, *Painting*: Field finishing of wood doors.
- B. See door schedule in drawings for types, sizes, and fire ratings of wood doors.

1.01 REFERENCES

NOTE List by number and full title reference standards referred to in remainder of specification section. Delete non-applicable references.

- A. American National Standards Institute (ANSI)
- ANSI A208.1 Particleboard
- B. American Society of Testing and Materials (ASTM):
- ASTM E90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- ASTM E413 Classification for Rating Sound Insulation
- ASTM E1408 Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems
- ASTM E2074 Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies
- C. American Woodwork Institute (AWI)
- AWI Quality Standards
- D. Code of Federal Regulations (CFR)
- CFR 16CFR 1201 Safety Standard for Architectural Glazing Materials
- E. Forest Stewardship Council® (FSC)

FSC STD-01-001 FSC Principles and Criteria for Forest Stewardship

F. National Fire Protection Association (NFPA[®])

NFPA 80 Standard for Fire Doors and Windows

G. Underwriters Laboratories (UL[®])

UL 10B Safety Fire Tests for Door Assemblies - Neutral Pressure

1.02 DEFINITIONS

- A. Warp: Any distortion in door plane independent of doorframe such as bow, cup, and twist.
- B. Bow: Curvature along length of the door measured as a deviation from a straight line extended from top to the bottom of door.
- C. Cup: Curvature along width of the door measured as deviation from the straight line extending from one door side to the opposite side.
- D. Twist: Deviation of one or two door corners being out of plane plane from the other corners.

1.03 SUBMITTALS

- A. Submit in accordance with section 01330, *Submittal Procedures*:
 - 1. Product data for wood doors including:
 - a. Door core and edge construction
 - b. Veneer species, cut, and matching
 - c. Factory finish materials and application.
 - (1) Vision lights
 - (2) Door louvers
 - 2. Shop drawings indicating door elevations, dimensions, swings, size and location of blocking for hardware, cutouts for [vision lights,] [louvers], and details for fabrication and installation.
 - 3. Door Schedule: Use same reference numbers as indicated in contract documents.
 - 4. Certificates Documenting

NOTE Include the following paragraph if fire-rated doors are required.

- a. Fire-rated units have been successfully tested in accordance with paragraph [1.05.B].

NOTE Include the following paragraph if acoustically rated doors are required.

- b. Acoustically rated doors have been successfully tested in accordance with paragraph [1.05.C].
5. Samples:
 - a. Factory finishes for selection by Contracting Officer
 - b. 8 by 10 inches minimum door panel sample illustrating selected finished face, core, edges, and corner.
6. Manufacturer's instructions for preparing, hanging, installing hardware, and adjusting wood doors. [Include requirements for installing fire-rated, positive pressure, and sound control doors.]
7. Copy of warranty required by paragraph [1.08] for review by Contracting Officer.
8. Sustainability Data:
 - a. Product data, material safety data sheet , or manufacturer's certification letter indicating no added urea-formaldehyde resins, glues or laminating adhesives in wood door materials and assemblies, as required by paragraph [2.02.A].
 - b. Vendor invoices demonstrating particle board wood door cores are FSC certified. Invoices shall contain the vendor's Chain-of-Custody (COC) number and identify each FSC certified product on a line-item basis.
 - c. FSC COC certificates indicating particle board door cores comply with forest certification requirements. Include documentation that manufacturer is certified for (COC) by an FSC-accredited certification body. Include statement indicating the weight percent of FSC particle board core relative to total door weight for each door type .

1.04 QUALITY ASSURANCE

NOTE Edit this article to reflect types of door assemblies being specified and project conditions.

- A. Conform to requirements of AWI Quality Standards, section 1300, *Architectural Flush Doors*.
- B. Single Source Responsibility: Obtain doors from one source and by a single manufacturer.

NOTE Include and edit the following paragraph if fire-rated doors are required.

- C. Fire-rated doors: Provide units complying with NFPA 80, identical to assemblies tested in accordance with ASTM E2074, and listed by UL, or other nationally recognized testing agency acceptable to SNL Site Fire Marshall. Units shall bear testing agency labels.
 1. Oversize Door Assemblies: Provide certificate that assemblies exceeding fire tested assembly sizes conform to fabrication of tested and labeled assemblies, except for size.

2. Temperature-Rise Rated Doors: Provide certificate that door type for exit enclosures have been tested to withstand 450° F, (232° C) temperature rise in 30 minutes of fire exposure.
3. Positive Pressure: Provide certificate that fire-rated doors have been tested for positive pressure in accordance with International Building Code[®] or NFPA.

NOTE Include the following paragraph if sound-rated door assemblies including door panel, frame, and hardware are required.

- D. Sound Transmission Class: Provide certificate that door assemblies have been tested in accordance with ASTM E413 and ASTM E1408 to achieve minimum sound transmission class of STC [43] [_____].
- E. Door Glazing: Comply with CFR 16CFR 1201 and other applicable safety requirements. Each piece of safety glazing shall be permanently labeled with appropriate marking.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect doors by packaging and other means during delivery, storage, and handling to prevent damage and warping.
- B. Site storage: Store flat on level surface in a clean, dry, well-ventilated area. Protect from sunlight. Cover to keep clean, but permit air circulation.
- C. Do not drag one door across another.
- D. Identify each door with opening number used on shop drawings, using temporary, removable, or concealed markings.

1.06 PROJECT CONDITIONS

- A. Do not deliver and install wood doors until site conditions have been stabilized and will be maintained at:
 1. Temperature: 60° to 90° F, (15° to 32° C)
 2. Relative Humidity: 25 to 50 percent

1.07 WARRANTY

- A. Submit in accordance with section 01770, *Closeout Procedures*:
 1. Warranty to cover repair or replacement of defective interior wood doors for life of initial installation including:
 - a. Materials and workmanship
 - b. Bowing, cupping, and twisting greater than ¼inch for 42 by 84 inch door panel.

- c. Telegraphing of core through veneer exceeding 0.01 inch in per 3 inches.
 - d. Delamination
2. Within 30 days of warranty expiration a walk through shall be performed to determine if doors are warped or bowed.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Algoma Hardwoods, Inc.; Algoma, Wisconsin; (www.algomahardwoods.com)
- B. Eggers Industries; Neenah, Wisconsin; (www.eggersindustries.com)
- C. Marshfield® Door Systems Inc.; Marshfield, Wisconsin; (www.marshfelddoors.com)
- D. Mohawk Flush Doors, Inc.; Northumberland, Pennsylvania; (www.mohawkdoors.com)
- E. VT Industries, Inc.; Holstein, Iowa; (www.vtindustries.com)
- F. Manufacturers of equivalent products submitted and approved in accordance with section 01330, *Submittal Procedures*.

2.02 SUSTAINABILITY REQUIREMENTS

- A. Urea-Formaldehyde: Wood door materials and assemblies shall contain no added urea-formaldehyde resins, glues, or laminating adhesive.
- B. Certified Wood: Particleboard door core wood shall be FSC-certified as required by paragraphs [2.03.C.1, 2.04.C.1, 2.05.A.1.a and 2.05.A.1.b].

2.03 FLUSH DOORS WITH WOOD VENEER FACE

NOTE Include this article if wood doors with wood veneer faces suitable for transparent finish are required.

- A. Type: Flush interior doors, 1-³/₄ - inches thick, solid core, 5-ply construction with wood veneer suitable for transparent finish.
- B. Construction: 5 plies with stiles and rails bonded to core and assembly sanded prior to gluing crossband and face veneer to each side of core. Comply with AWI section 1300, PC-5, Premium Grade.
- C. Core: Particleboard, ANSI A208.1 1-LD-1 Grade
 - 1. Certified Wood: Produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001.
 - 2. Core bonding adhesive: Resins complying with ANSI A208.1 formaldehyde limits. Adhesive shall not contain urea-formaldehyde resin.

3. Blocking: Provide 5 inch wide minimum wood blocking for installation of locksets, closers, exit devices, kick plates, and other hardware items and eliminate need for through-bolting.
4. Bonding: Glue stiles and rails to core and sand core assembly prior to applying faces. Glue shall not contain urea-formaldehyde resin.

D. Stiles: 1³/₈ - inches minimum hardwood, same species as face veneer with no visible joints

E. Top and bottom rails: 1¹/₈ - inches minimum solid wood

NOTE Quarter-sliced, cherry is standard species and cut used at SNL for wood door veneer with transparent finish.

F. Wood veneer:

1. Species: Quarter-sliced cherry, AWI Grade AA, suitable for transparent finish.

NOTE SNL standard for doors with transparent finish is center balance, book matched wood veneer using an even number of equal width leaves arranged in sequence of cutting so that adjacent leaves have a mirror-like image.

2. Matching:

- a. Center Balance Matching: Provide an even number of equal width veneer leaves from same flitch.
- b. Book Matched: Veneers arranged in sequence with adjacent leaves forming a mirror-like image.

NOTE Include the following two paragraphs if door pairs are required for project.

- c. Pair Patching: Provide for doors hung in same opening.
- d. Set Matching: Provide for adjacent door pairs in close proximity.

NOTE Include the following paragraph if transom panels are being specified.

- e. Transom Match: Transom panel and adjacent door panel shall have a continuous match.

NOTE SNL standard for wood veneer doors is factory applied transparent finish.

G. Finish: Factory finish wood doors in accordance with AWI Quality Standard section 1500, System TR-6, Custom Quality.

1. Type: Water-based stain followed by transparent ultraviolet cured, catalyzed polyurethane finish.
2. Color: As selected by Contracting Officer from manufacturer's full range.
3. Grain effect: Filled finish
4. Sheen: Satin semi-gloss

5. Seal top door edge with color sealer to match door facing.

2.04 FLUSH DOORS WITH HARDBOARD FACE

NOTE Include this article if wood doors with hardboard faces suitable for opaque paint finish are required.

- A. Type: Flush interior doors, 1-³/₄ inches thick, solid core, 3-ply construction with hardboard face suitable for opaque paint finish.
- B. Construction: 3 plies with stiles and rails bonded to core and assembly sanded prior to applying hardboard faces. Comply with AWI section 1300, PC-3, Economy Grade.
- C. Core: Particleboard, ANSI A208.1 1-LD-1 Grade
 1. Certified Wood: Produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001.
 2. Core Bonding Adhesive: Resins complying with ANSI A208.1 formaldehyde limits. Adhesive shall not contain urea-formaldehyde resin.
 3. Blocking: Provide 5 inch wide minimum wood blocking for installation of locksets, closers, exit devices, kick plates, and other hardware items and eliminate the need for through-bolting.
 4. Bonding: Glue stiles and rails to core and sand core assembly prior to applying faces. Glue shall not contain urea-formaldehyde resin.
- D. Stiles: 1-³/₈ inches minimum solid wood
- E. Top and bottom rails: 1-¹/₈ inches minimum solid wood
- F. Face: Hardboard
- G. Factory prime wood doors with one coat of wood primer in preparation for site applied opaque paint finish.

2.05 FIRE-RATED WOOD DOORS

NOTE Include this article if fire-rated wood doors are required. Edit to reflect required fire ratings.

- A. Types: Provide fire-rated wood doors as indicated on door schedule in drawings. Attach fire rating label to door edge.
 1. 20 minutes label: AWI FD ¹/₃
 - a. Wood Veneer: 5-ply with particleboard core and wood veneer face, AWI PC-5, Premium Grade as specified in paragraph 2.02.

- b. Hardboard Face: 3-ply with particleboard core and hardboard face, AWI PC-3, Economy Grade as specified in paragraph 2.03.
2. Mineral Core Fire-Rated Doors: AWI [FD-3/4, 45 minutes label] [FD-1, 60 minutes label] [FD 1-½, 90 minutes label] door with non-combustible mineral composition core.
 - a. Wood Veneer: 5-ply construction with stiles and rails bonded to mineral core and assembly sanded prior to gluing crossband and face veneer to each side of core. Comply with AWI section 1300, FD-5, Premium Grade. Wood veneer face as specified in paragraphs [2.02.F and G].
 - b. Hardboard Face: 3 plies with stiles and rails bonded to a mineral core and assembly sanded prior to applying hardboard faces. Comply with AWI section 1300, FD-3, Economy Grade.
 - c. Blocking: Provide 5 inch wide minimum composite blocking for installation of locksets, closers, exit devices, kickplates, and other hardware items and eliminate need for through-bolting. Provide composite blocking to have improved screw-holding capability and be approved for required fire rating.

NOTE For fire-rated doors requiring positive pressure fire resistance, intumescent hot smoke seals are required for door perimeter. Seals expand at 400° F filling gap around door panel. Intumescent seals may be surface applied to doorframe and specified in section 08710, *Door Hardware*. Some wood door manufacturers provide intumescent seals concealed within door edges. Include and edit the following paragraph if concealed intumescent seals are required.

3. Intumescent hot smoke seals: Conceal in door edges chemically inert, expandable, intumescent seal designed for multi-directional expansion at 400° F, (204° C) filling gap around perimeter of door. [At contractor's option, surface applied intumescent seals may be provided in lieu of concealed seals as part of section 08710, *Door Hardware*. Seals shall be tested and approved for fire-rated door assemblies in accordance with UL Standard 10B].

NOTE Include the following paragraph if pairs of fire-rated wood doors are required. Coordinate requirements with hardware being provided in section 08710, *Door Hardware*.

4. Fire-Rated Door Pairs: Provide formed steel edges and astragals [with intumescent seals] as required for indicated fire ratings. Finish with baked enamel in color to match door.

NOTE Include the following paragraph if fire-rated wood doors are required for stairwells and other types of exit enclosures.

5. Temperature-Rise Rated Doors: Provide temperature-rise rated doors for [stairwells and other] exit enclosures to withstand 450° F (232° C) minimum temperature rise in 30 minutes of fire exposure.

2.06 SOUND RETARDANT WOOD DOORS

NOTE Include this article if sound control wood door assemblies are required. Essential to accomplishing desired sound transmission class (STC) is use of perimeter gaskets and automatic door bottom to be specified in section 08710, *Door Hardware*.

- A. Types: Provide sound-retardant wood doors as indicated on the door schedule in drawings.
- B. Provide sound dampening core to achieve sound transmission class of [STC-43] [_____] tested in accordance with ASTM E90 and ASTM E413.

NOTE Select one of the following paragraphs to reflect type of face required for sound-retardant doors.

- C. Wood Veneer: 5-ply construction with stiles and rails bonded to core and assembly sanded prior to gluing crossband and face veneer to each side of core. Comply with AWI section 1300, PC-5, Premium Grade. Wood veneer face as specified in paragraphs [2.02.F and G].
- D. Hardboard Face: 3 plies with stiles and rails bonded to core and assembly sanded prior to applying hardboard faces. Comply with AWI section 1300, PC-3, Economy Grade.

2.07 TRANSOM PANELS

NOTE Include this article if floor to ceiling door frames are used with flush wood transom panel installed above door panel.

- A. Type: Flush panel, 1¾ - inches thick, fabricated same as flush door specified in paragraph [2.02]. Size as indicated on drawings.
- B. Veneer of transom panel shall be a continuous match with door panel veneer.
- C. Attachment: Provide fasteners, clips, and brackets as recommended by manufacturer for concealed installation of transom panel to door frame.

2.08 VISION LIGHTS

NOTE Include this article if wood doors contain vision lights.

- A. Provide vision lights of dimensions and configurations indicated on drawings.
- B. Type: Metal frame with countersunk mounting holes.

NOTE Include the following paragraph if vision lights are installed in fire-rated doors. Coordinate size of light in order not to exceed allowable size for specific fire rating.

- C. Provide fire rated, labeled vision lights for doors indicated on door schedule to be fire rated.
- D. Material: 18-gauge cold-rolled steel hot dipped galvanized
- E. Finish: Factory primed
- F. Glazing as specified in section 08800, *Glazing*:
 - 1. Fire-rated doors: ¼inch clear wire glass with square mesh
 - 2. Non-rated doors: ¼inch clear tempered safety glass
- G. Glazing stops: Rectangular profile. Exterior stop to be non-removable. Interior stop to be removable snap-on type or attached with countersunk screws.

- H. Factory prepare door with cutout to receive vision light. Ship light separately as kit to be field installed to prevent damage to door finish.

2.09 DOOR LOUVERS

NOTE Include this article if louvers are to be installed in wood doors. Select type of louver required. If operable louvers are required, this type will need to be added.

- A. Type: Manufactured, metal-framed louver with fixed blades, perimeter flanges, mitered corners, and countersunk mounting holes for installation in steel doors.
 - 1. Non-vision inverted Y: Y shaped blades providing 50 percent of free area.
 - 2. Non-vision inverted V: V shaped blades providing 60 percent of free area.
 - 3. Lightproof double inverted V: Two sets of V shaped blades preventing light passage with 60 percent free area.

NOTE Include the following paragraph if louvers are installed in fire-rated doors. Coordinate size of louver to ensure integrity of fire-rated doors.

- B. Fire-rated louver: Provide fire-rated doors with metal-framed louver of type specified in paragraph [2.08.A] and equipped with fusible link closing device. Louver shall be labeled for required fire rating.
- C. Size: As indicated on drawings.
- D. Material: Cold rolled steel galvanized, 18-gauge for frame and 20-gauge for blades.
- E. Finish: Baked enamel factory finish. Color selected by Contracting Officer.
- F. Factory prepare door with cutout to receive louver. Ship louver separately as kit to be field installed in order to prevent damage to door finish.

2.10 FACTORY FITTING

- A. Factory fit doors to coincide with designated frame opening sizes with these clearances and bevels:
 - 1. Non-Rated Door Clearances:
 - a. Head, jamb, and between double doors: $\frac{1}{8}$ inch
 - b. Bottom of door to floor finish: $\frac{1}{8}$ inch
 - c. Bottom of door to top of threshold: $\frac{1}{4}$ inch
 - 2. Fire-Rated Door Clearances: Comply with NFPA 80
 - 3. Lock and hinge door edges shall be beveled $\frac{1}{8}$ inch in per 2 inches. Bevel of fire-rated doors shall not exceed that permitted by labeling agency.
- B. Factory machine doors to receive hardware in accordance with AWI requirements, section 08710, *Door Hardware*, and supplied hardware templates.

1. Machine cut relief for hinges and coring for locksets, cylinders, and other items.
 2. Pilot drill screw and bolt holes.
- C. Seal cut surfaces after fitting and machining. Ensure that hardware recess edges are sealed with minimum two coats of varnish.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Inspect door and frames prior to hanging. Reject doors with defects. Verify frames are correct size and type, securely anchored, heads are level, and jambs are plumb.
- B. Do not proceed until deficiencies are addressed.

3.02 INSTALLATION

- A. Install wood doors in accordance with approved shop drawings, manufacturer's instructions, and AWI Custom Quality Standards.

NOTE Include the following paragraph if fire-rated doors are required.

- B. Install fire-rated doors in accordance with NFPA 80 for class indicated in door schedule on drawings.

NOTE Include the following paragraph if sound-retardant doors are required.

- C. Install sound-retardant doors in sound control openings with appropriate hardware as indicated on drawings.
- D. Hang doors and install hardware [and [vision lights] [door louvers]].
- E. Fitting: Align and fit doors in frames with uniform clearances and bevels. Do not trim stiles and rails in excess of limits of manufacturer and permitted for fire-rated doors. Ensure that clearances specified in paragraph [2.09.A] are maintained.
- F. Restore factory applied door finish if site fitting and machining is required.
- G. Adjust hung doors for smooth and balanced movement. Rehang or replace doors that do not operate freely.

NOTE Include the following paragraph if hardboard faced doors are required.

- H. Field finish doors with hardboard face with opaque paint finish specified in section 09900, *Painting*. Do not paint over fire rating labels.

END OF SECTION