

PART 1 - GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A250.4 (1994) Test Procedure and Acceptance
Criteria for Physical Endurance for Steel
Doors and Hardware Reinforcings

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 591/ A 591M (1989; R 1994) Steel Sheet, Electrolytic
Zinc- Coated, for Light Coating Mass
Applications

ASTM A 653/ A 653M (1996) Steel Sheet, Zinc- Coated
(Galvanized) or Zinc- Iron Alloy- Coated
(Galvannealed) by the Hot- Dip Process

ASTM C 578 (1995) Rigid, Cellular Polystyrene Thermal
Insulation

ASTM C 591 (1994) Unfaced Preformed Rigid Cellular
Polyisocyanurate Thermal Insulation

ASTM C 665 (1995) Mineral- Fiber Blanket Thermal
Insulation for Light Frame Construction
and Manufactured Housing

ASTM D 2863 (1995) Measuring the Minimum Oxygen
Concentration to Support Candle- Like
Combustion of Plastics (Oxygen Index)

ASTM E 283 (1991) Rate of Air Leakage Through
Exterior Windows, Curtain Walls, and Doors
Under Specified Pressure Differences
Across the Specimen

DOOR AND HARDWARE INSTITUTE (DHI)

ANSI/ DHI A115 (1991) Steel Door Preparation Standards
(consisting of A115.1 through A115.6 and A115.12
through A115.18)

HOLLOW METAL MANUFACTURER'S ASSOCIATION (HMMA)

HMMA HMM (1992) Hollow Metal Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1995) Fire Doors and Fire Windows
NFPA 105	(1993) Smoke- Control Door Assemblies
NFPA 252	(1995) Fire Tests of Door Assemblies

STEEL DOOR INSTITUTE (SDI)

ANSI/ SDI 100	(1991) Standard Steel Doors and Frames
SDI 105	(1992) Recommended Erection Instructions for Steel Frames
SDI 107	(1984) Hardware on Steel Doors (Reinforcement - Application)
SDI 111F	Recommended Completed Opening Anchors for Standard Steel Doors and Frames
SDI 113	(1979) Apparent Thermal Performance for Steel Door and Frame Assemblies

UNDERWRITERS LABORATORIES INC. (UL)

UL 10B	(1997) Fire Tests of Door Assemblies
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1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

1.2.1 SD-02, Shop Drawings

- a. Doors
- b. Frames
- c. Accessories
- d. Weatherstripping

Show elevations, construction details, metal gages, hardware provisions, method of glazing, and installation details.

- a. Schedule of doors
- b. Schedule of frames
- c. Submit door and frame locations.

1.2.2 SD- 03, Product Data

- a. Doors
- b. Frames
- c. Accessories
- d. Weatherstripping

Submit manufacturer's descriptive literature for doors, frames, and accessories. Include data and details on door construction, panel (internal) reinforcement, insulation, and door edge construction. When "custom hollow metal doors" are provided in lieu of "standard steel doors," provide additional details and data sufficient for comparison to ANSI/ SDI 100 requirements.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver doors, frames, and accessories undamaged and with protective wrappings or packaging. Strap knock-down frames in bundles. Provide temporary steel spreaders securely fastened to the bottom of each welded frame. Store doors and frames on platforms under cover in clean, dry, ventilated, and accessible locations, with 1/4 inch airspace between doors. Remove damp or wet packaging immediately and wipe affected surfaces dry. Replace damaged materials with new.

PART 2 - PRODUCTS

2.1 STANDARD STEEL DOORS

ANSI/ SDI 100, except as specified otherwise. Doors shall be either hollow steel construction or composite construction. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Undercut where indicated. Exterior doors shall have top edge closed flush and sealed to prevent water intrusion. Doors shall be 1 3/4 inches thick, unless otherwise indicated.

2.1.1 Door Grades

2.1.1.1 Extra Heavy Duty Doors

ANSI/ SDI 100, Grade III, Model 2, or 2A (seamless design) with core construction. Type f (vertical steel stiffeners) for interior doors and type f (vertical steel stiffeners) for exterior doors of size and design indicated. Where type f cores are specified or scheduled, the space between the stiffeners shall be filled with mineral-fiber insulation as specified in paragraph "Insulation Cores". Provide Grade III at all locations.

2.2 CUSTOM HOLLOW METAL DOORS

Provide custom hollow metal doors where nonstandard steel doors are indicated. At the Contractor's option, custom hollow metal doors may be provided in lieu of standard steel doors. Door sizes, design, materials, construction, gages, and finish shall be as specified for standard steel doors and shall comply with the requirement of HMMA HMM. Fill all spaces in doors with insulation. Close top and bottom edges with steel channels not lighter than thick 16 gage. Close tops of exterior doors flush with an additional channel and seal to prevent water intrusion. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Undercut doors where indicated. Doors shall be 1 3/4 inches thick, unless otherwise indicated.

2.3 INSULATED STEEL DOOR SYSTEMS

Insulated steel doors shall have a core of polyurethane foam and an R factor of 10.0 or more (based on a k value of 0.16); face sheets, edges, and frames of galvanized steel not lighter than 23 gage, 16 gage, 16 gage respectively; magnetic weatherstripping; nonremovable- pin hinges; thermal- break aluminum threshold; and vinyl door bottom. Doors and frames shall receive phosphate treatment, rust- inhibitive primer, and baked acrylic enamel finish. Doors shall have been tested in accordance with ANSI A250.4 and shall have met the requirements for Level C. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Doors shall be 1 3/ 4 inches thick.

2.4 ACCESSORIES

2.4.1 Moldings

Provide moldings around glass of interior and exterior doors and louvers of interior doors. Provide nonremovable moldings on outside of exterior doors and on corridor side of interior doors. Other moldings may be stationary or removable. Secure inside moldings to stationary moldings, or provide snap- on moldings. Muntins shall interlock at intersections and shall be fitted and welded to stationary moldings.

2.5 INSULATION CORES

Insulated cores shall be of type specified, shall provide maximum assembly U- value of .48 in accordance with SDI 113 and shall conform to:

- a. Rigid Polyurethane Foam: ASTM C 591, Type 1 or 2, foamed- in- place or in board form, with oxygen index of not less than 22 percent when tested in accordance with ASTM D 2863; or
- b. Rigid Polystyrene Foam Board: ASTM C 578, Type I or II.

2.6 STANDARD STEEL FRAMES

ANSI/ SDI 100, except as otherwise specified. Form frames to sizes and shapes indicated, with welded corners for drywall construction. Provide steel frames for doors, sidelights, and interior glazed panels, unless otherwise indicated.

2.6.1 Welded Frames

Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth. Provide welded frames in masonry construction.

2.6.2 Stops and Beads

Form stops and beads from 20 gage steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval- head, countersunk Phillips self- tapping sheet metal screws or concealed clips and fasteners. Space fasteners approximately 12 to 16 inches on centers. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

2.6.3 Anchors

Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage.

2.6.3.1 Wall Anchors

Provide at least three anchors for each jamb. For frames which are more than 7.5 feet in height, provide one additional anchor for each jamb for each additional 2.5 feet or fraction thereof. Locate anchors opposite top 4 bottom hinges, and midway between.

a. Masonry: Provide anchors of corrugated or perforated steel straps or 3/16 inch diameter steel wire, adjustable or T-shaped;

b. Stud partitions: Weld or otherwise securely fasten anchors to backs of frames. Design anchors to be fastened to closed steel studs with sheet metal screws;

c. Completed openings: Secure frames to previously placed concrete or masonry with expansion bolts in accordance with SDI 111F; and

2.7 FIRE RATED DOORS AND FRAMES

NFPA 80 and NFPA 105 and this specification. The requirements of NFPA 80 and NFPA 105 shall take precedence over details indicated or specified.

2.7.1 Labels

Fire doors and frames shall bear the label of Underwriters Laboratories, Inc. (UL), Factory Mutual Engineering Corporation (FM), or Warnock Hersey International (WHI) attesting to the rating required. Testing shall be in accordance with NFPA 252 or UL 10B. Labels shall be metal with raised letters, and shall bear the name or file number of the door and frame manufacturer. Labels shall be permanently affixed at the factory to frames and to the hinge edge of the door. Door labels shall not be painted.

2.8 WEATHERSTRIPPING

As specified in Section 08710, "Door Hardware."

2.9 HARDWARE PREPARATION

Reinforce, drill, and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of SDI 107 and ANSI/DHI A115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Locate hardware in accordance with the requirements of ANSI/SDI 100, as applicable. Punch door frames, with the exception of frames that will have weatherstripping to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors.

Set lock strikes out to provide clearance for silencers.

2.10 FINISHES

2.10.1 Hot-Dip Zinc-Coated and Factory-Primed Finish

Fabricate doors, frames and louvers from galvanized steel, ASTM A 653/ A 653M, Coating Designation G90. Repair damaged zinc- coated surfaces by the application of zinc dust paint. Phosphate treat and factory prime zinc- coated surfaces as specified in ANSI/ SDI 100. Provide for all exterior doors.

2.11 FABRICATION AND WORKMANSHIP

Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction indicated. Corner joints shall be well formed and in true alignment. Conceal fastenings where practicable. Design frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to receive calking compound.

2.11.1 Grouted Frames

For frames to be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop- applied head and jamb seals.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Frames

Set frames in accordance with SDI 105. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder- actuated fasteners. Build in or secure wall anchors to adjoining construction. Where frames require ceiling struts or overhead bracing, anchor frames to the struts or bracing. Backfill frames with mortar. Coat inside of frames with corrosion-inhibiting bituminous material. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.

3.1.2 Doors

Hang doors in accordance with clearances specified in ANSI/ SDI 100. After erection and glazing, clean and adjust hardware.

3.1.3 Fire Doors and Frames

Install fire doors and frames, including hardware, in accordance with NFPA 80. Install fire rated doors and frames in accordance with NFPA 80 and NFPA 105.

3.2 PROTECTION

Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is removed. Clean thoroughly. Apply an all- over coat of rust- inhibitive paint of the same type used for shop coat.

3.3 CLEANING

Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

END OF SECTION