

1. GENERAL

1.1. SECTION INCLUDES

- A. Comply with the requirements of Division 1.
- B. Provide the following products as listed on the door schedule and shown on the drawings, including but not limited to the following:
 - 1. Hollow metal doors
 - 2. Hollow metal frames
 - 3. Side lights, transom frames and borrowed lights
 - 4. Hollow metal panels
 - 5. Preparation of hollow metal doors and frames for finish hardware.

1.2. RELATED SECTIONS

- A. The following description of work is included for reference only and shall not be presumed complete:
 - 1. Finish carpentry: 06 20 00
 - 2. Wood doors: 08 14 00
 - 3. Stainless steel doors: 08 11 19
 - 4. Sound control door assemblies: 08 34 73
 - 5. Door hardware: 08 71 00
 - 6. Glazing: 08 80 00
 - 7. Painting and coating: 09 90 00
 - 8. Electrical: 26 00 00

1.3. REFERENCES

- A. ANSI A250.3-2007: Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames (recommended for factory finished products)
- B. ANSI A250.4-2001: Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings
- C. ANSI A250.10-1998 (R2004): Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
- D. ANSI A250.13-2008: Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies
- E. ANSI/UL 1784-2004: Air Leakage Tests of Door Assemblies, 3rd edition
- F. ASTM A653/A653M-10: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- G. ASTM E90-09: Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- H. ASTM C518 – 04: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- I. ASTM E413-04: Classification for Rating Sound Insulation
- J. NAAMM-HMMA 803-08: Steel Tables
- K. NAAMM-HMMA 810-09: Hollow Metal Doors
- L. NAAMM-HMMA 820-08: Hollow Metal Frames
- M. NAAMM-HMMA 831-11: Recommended Hardware Locations for Hollow Metal Doors and Frames
- N. NAAMM-HMMA 840-07: Guide Specification for Installation of Hollow Metal Doors and Frames

- O. NAAMM-HMMA 850-00: Fire Rated Hollow Metal Doors and Frames
- P. NFPA 80-10: Standard for Fire Door and Other Opening Protectives
- Q. NFPA 101: Life Safety Code
- R. NFPA 105-10: Standard for the Installation of Smoke Door Assemblies
- S. NFPA 252-08: Standard Methods of Fire Tests of Door Assemblies
- T. NFPA 257-07: Standard on Fire Tests for Window and Glass Block Assemblies
- U. CAN/ULCS770-09: Standard Test Method for Determination of Long-term Thermal Resistance of Closed-Cell Thermal Insulating Foams
- V. UL 10C: Standard for Safety Positive Pressure Fire Tests of Door Assemblies

1.4. PRE-INSTALLATION MEETING

- A. Plan and manage a pre-installation meeting to explain the proper methods to install hollow metal doors and frames.

1.5. SUBMITTALS

- A. Make submittals in accordance with Section 01 33 00.
- B. Provide the following items in the submittal package:
 - 1. Door schedule
 - 2. Elevations of each door type
 - 3. Details of doors, including vertical and horizontal edge details and metal thickness
 - 4. Frame details for each frame type, including profiles and metal thickness
 - 5. Locations of reinforcements and preparation for hardware
 - 6. Details of each different wall opening condition
 - 7. Details of anchorage, joints, field splices and connections
 - 8. Details of accessories
 - 9. Details of moldings, removable stops and glazing
 - 10. Details of conduit and preparations for power, signal, and control systems
- C. Upon Architect request, provide technical information on selected items.
- D. Upon Architect request, provide 254 mm x 254 mm (10 in x 10 in) corner sample on selected items.
 - 1. Doors: Show vertical edge, end channels, core, hinges and other applied hardware reinforcements; glazing if applicable.
 - 2. Frames: Show profile, corner joint at head and jamb, anchors, glazing stop to show intersection between head and jamb; fixed panels if applicable.
- E. Finish paint: Submit finish paint color samples of 127 mm x 127 mm (5 in x 5 in).
- F. Provide products meeting the following LEED performance criteria:
 - 1. MRc4: For a product with recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Provide product with maximum pre-consumer and post-consumer recycled content available, supported by appropriate documentation
- G. Test and evaluation reports: Submit the following test and evaluation reports:
 - 1. Steel door and frame assemblies supplied under this section meet acceptance criteria of ANSI A250.4, Level A [Level B], [Level C]
 - 2. Primer applied on steel door and frame assemblies meet acceptance criteria of ANSI A250.10.
 - 3. Factory painted steel door and frame assemblies meet acceptance criteria of ANSI A250.3.

4. Insulated doors supplied in exterior openings meet specified thermal resistance rating.
5. Acoustic door and frame assemblies provide the STC and sound TL values specified within the critical frequency range, as determined and scheduled by the Consultant.
6. Windstorm rated assemblies meet standard ANSI A250.13, Class 1 requirements.
7. Ensure reports include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of the test.

H. Closeout submittals

1. Provide the following information to the Owner:
 - a. One copy of the as-built door and frame schedule;
 - b. Name, address and phone number of manufacturer's distributors;
 - c. One copy of the manufacturer's product warranty;
 - d. Manufacturer's product maintenance instructions.

1.6. QUALITY ASSURANCE

- A. Manufacturers: Execute work in this Section by a manufacturer who is a member of NAAMM. Ensure product quality meets standards set by this association.
- B. Ensure product is manufactured by a firm experienced in design and production of standard and custom commercial steel door and frame assemblies, integration of builders' or electronic hardware and glazing assemblies, and other items affecting work.
- C. Distributors: Execute work in this Section by a distributor who has a minimum of 5 years' experience in similar projects.
- D. Installers: Execute work in this Section by an installer who has a minimum of 5 years' experience in similar projects.
- E. Doors and frames from a single source manufacturer.

1.7. DELIVERY, STORAGE AND HANDLING

- A. Delivery:
 1. Make deliveries in accordance with Section 01 65 00.
 2. Identify products with a label indicating manufacturer's name, Architect's opening number, product description and dimensions.
 3. Protect doors and frames during shipping.
 4. Upon delivery, inspect products for quantity and damage.
 5. Repair or replace damaged products before installation.
- B. Storage and handling:
 1. Store and handle products in accordance with Section 01 66 00.
 2. Store products in a clean, dry and secure area.
 3. Store and protect materials in accordance with NAAMM-HMMA 840.
 4. Remove wrappings or coverings from doors upon delivery at site. Store doors and welded frames in a vertical position with a minimum of 6 mm (1/4 in) space between them. Place material on blocking at least 102 mm (4 in) off the ground to permit air circulation.

1.8. WARRANTY

- A. Manufacturer's warranty: One year from substantial completion of the project on both material and workmanship.

2. PRODUCTS

2.1. MANUFACTURERS

A. Acceptable manufacturer:

1. de La Fontaine Inc. : www.delafontaine.com.

B. Substitutions:

1. Comply with Section 01 25 00
2. Equal products in design, function and quality will be accepted upon Architect's approval only.

2.2. MATERIALS

A. Steel requirements:

1. Interior doors and frames: Comply with ASTM A653, Designation ZF 120 (A40)
2. Exterior doors and frames: Comply with ASTM A653, Designation ZF 180 (A60).

2.3. ACCESSORIES

A. Glazing moldings and stops

1. Sandwich overlapping kit
 - a. Two components with welded mitered corners and secured with minimum # 6 corrosion-resistant countersunk sheet metal screws.
 - b. Glazing moldings fabricated from 20-gauge, 0.8 mm (0.032 in) minimum.
 - c. Fire-rated doors shall be prepared for listed glazing as required in accordance with the door manufacturer's fire rating procedure.
 - d. Install screws on non-secure side.
 - e. 18-gauge, 1.1 mm (0.042 in) channel reinforcements on glass size equal to or bigger than half-glass.
 - f. Glazing to comply with Section 08 80 00.
2. Flush kit
 - a. On non-secure side, provide a full flush, non-removable molding.
 - b. Glazing moldings fabricated from 20-gauge, 0.8 mm (0.032 in) minimum.
 - c. Removable glass stops shall be channel-shaped, 20-gauge, 0.8 mm (0.032 in) minimum thickness, with tight-fitting butt or mitered corners and secured with minimum # 6 corrosion-resistant countersunk sheet metal screws.
 - d. Fire-rated doors shall be prepared for listed glazing as required in accordance with the door manufacturer's fire rating procedure.
 - e. Install screws on non-secure side.
 - f. 18-gauge, 1.1 mm (0.042 in) channel reinforcements on glass size equal to or bigger than half-glass.
 - g. Glazing to comply with Section 08 80 00.

B. Frame accessories

1. Provide dust/mortar box at strike location on drywall and masonry frames.
2. Provide mortar guards for hinge reinforcements on masonry frames.
3. Provide temporary spreaders on welded frames. Provide one (1) bar for frames with less than 178 mm (7 in) jamb depth. Provide two (2) bars for frames with 178 mm (7 in) or greater jamb depth.
4. Drill holes for silencers. Single openings: 3 per strike jamb, located at hinge height. Pair openings: 2 per header at approximately 150 mm (6 in) each side of centerline of head stop.

C. Louvers

1. Louvers for non-fire rated doors shall be welded inverted V type, Y type.
2. Inverted V and Y type vanes shall be not less than 18-gauge, 1.1 mm (0.042 in) thickness.
3. Fire-rated doors shall be prepared for listed, automatic closing, fusible link; fire door louvers.
4. Louvers for exterior doors shall be provided with insect and/or bird screens.
5. Provide louvers of same material as door sheet.

2.4. DOOR FABRICATION

A. Door cores:

1. Interior openings: Impregnated honeycomb, with 25 mm (1 in) cell maximum diameter.
Steel stiffened core: Continuous vertically formed steel sections, full thickness of the interior space between door faces. Stiffeners shall be 22 gauge, 0.6 mm (0.026 in) minimum thickness, spaced 152 mm (6 in) apart and securely fastened to both face sheets by industrial glue or laser welds [spot welded spaced a maximum of 127 mm (5 in) o. c. vertically]. Spaces between stiffeners shall be filled with polystyrene core Type 1, fire retardant conforming to ASTM C518.
2. Exterior openings: Polystyrene core Type 1, fire retardant conforming to ASTM C578 and a minimum R value of 7.03 (hr x°F x sq.ft)/BTU conforming to ASTM C518.
[Urethane core: Rigid, cellular type, board, or foamed-in-place containing no urea formaldehyde resins and a minimum R value of 10.0 (hr x°F x sq.ft)/BTU, conforming to LTTR, CAN/ULCS770].
3. Temperature rise: Core composition to limit temperature rise on unexposed side of door to 250 degrees C (450 F) at 30 minutes. Test core as part of complete assembly in accordance with NFPA 252.

B. Hollow metal doors in light duty application

1. Physical performance: Level C according to ANSI A250.4.
2. Metal thickness: 20-gauge, 0.81 mm (0.032 in).

3. Edge construction: Full flush lock seam on edge [full flush lock seam on edge, industrial adhesive or tack welded every 254 mm (10 in) and putty filled].
4. Fabricate door to be flush with one continuous face free from joints, tool markings and abrasions, and with provision for glass and/or louvers as indicated on Door Schedule and Drawings.

C. Hollow metal doors in moderate duty application

1. Physical performance: Level B according to ANSI A250.4.
2. Metal thickness: 18-gauge, 1.1 mm (0.042 in).
3. Edge construction: Full flush lock seam on edge [full flush lock seam on edge, industrial adhesive or tack welded every 254 mm (10 in) and putty filled], [full flush seamless with continuously welded edge seam; flush internal edge reinforcements of 16-gauge, 1.34 mm (0.053 in)].
4. Fabricate door to be flush with one continuous face free from joints, tool markings and abrasions, and with provision for glass and/or louvers as indicated on Door Schedule and Drawings.

D. Hollow metal doors in heavy duty application

1. Physical performance: Level A according to ANSI A250.4.
2. Metal thickness: 16-gauge, 1.34 mm (0.053 in).
3. Edge construction: Full flush lock seam on edge [full flush lock seam on edge, industrial adhesive or tack welded every 254 mm (10 in) and putty filled], [full flush seamless with continuously welded edge seam; flush internal edge reinforcements of 16-gauge, 1.34 mm (0.053 in)].
4. Fabricate door to be flush with one continuous face free from joints, tool markings and abrasions, and with provision for glass and/or louvers as indicated on Door Schedule and Drawings.

E. Hollow metal doors in maximum duty application

1. Physical performance: Level A according to ANSI A250.4.
2. Metal thickness: 14-gauge, 1.70 mm (0.067 in).
3. Edge construction: Full flush seamless with continuously welded edge seam; flush internal edge reinforcements of 14-gauge, 1.70 mm (0.067 in).
4. Fabricate door to be flush with one continuous face free from joints, tool markings and abrasions, and with provision for glass and/or louvers as indicated on Door Schedule and Drawings.

F. Door models

1. As indicated in the Door and Frame schedule.
 - a. Pre-embossed panel door
 - b. Custom embossed panel door
 1. Select from de La Fontaine CED series or [submit Designer's customized drawing]
 2. Select U type embossing or [V type embossing]
 3. Select embossed or [reverse-embossing]
 - c. Door with inlays

1. Select from de La Fontaine INL series or [submit Designer's customized drawing]
 2. Select inlay material from de La Fontaine standards or [submit Designer's choice]
- e. Door with recessed panel
1. Select from de La Fontaine RPD series or [submit Designer's customized drawing]
 2. Select molding design and material from de La Fontaine standards or [submit Designer's choice]
- f. Door with combined models
1. Submit Designer's customized drawing
 2. Select type of embossing, inlay material, moldings from de La Fontaine standards or [submit Designer's choice]
- G. End channels:
1. Interior door:
 - a. Top of door: Close top of door with same material as face sheets, minimum 18-gauge, 1.1 mm (0.042 in). Steel inverted channel, projection welded. [Steel flush channel unfilled, projection welded.], [Fully continuously welded centered seam, no putty with flush internal reinforcement of minimum 18-gauge, 1.1 mm (0.042 in)].
 - b. Bottom of door: Close bottom of door with same material as face sheets, minimum 18-gauge, 1.1 mm (0.042 in). Steel inverted channel projection welded. [Steel flush channel unfilled, projection welded], [Fully continuously welded centered seam, no putty with flush internal reinforcement of minimum 18-gauge, 1.1 mm (0.042 in)].
 2. Exterior door:
 - a. Top of door: Close top of door with same material as face sheets, minimum 18-gauge, 1.1 mm (0.042 in). Steel flush channel, putty-filled seam and ground smooth, sealed, projection welded. [Fully continuously welded centered seam, no putty with flush internal reinforcement of minimum 18-gauge, 1.1 mm (0.042 in)].
 - b. Bottom of door: Close bottom of door with same material as face sheets, minimum 18-gauge, 1.1 mm (0.042 in). Steel inverted channel, projection welded. [Steel flush channel unfilled, projection welded], [Steel flush channel, putty-filled seam and ground smooth, sealed, projection welded.] [Fully continuously welded centered seam, no putty with flush internal reinforcement of minimum 18-gauge, 1.1 mm (0.042 in)].
 - c. Provide weep-hole openings in bottom of exterior doors to allow moisture to escape.
- H. Vertical edges on active doors:
1. Beveled edges on both sides: 3 mm per 50 mm, (1/8 in per 2 in). Square vertical edges are not acceptable.

2.5. FRAME FABRICATION

- A. Hollow metal frame in light duty application

1. Frames:
 - a. Physical performance: Level C according to ANSI A250.4.
 - b. Metal thickness: 18-gauge, 1.1 mm (0.042 in).
 - c. Metal thickness for openings over 1219 mm (48 in): 16-gauge, 1.34 mm (0.053 in).
 - d. Frame assembly: Face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face], [Knockdown].
2. Side light, transom frame, borrowed light:
 - a. Metal thickness: 16-gauge, 1.34 mm (0.053 in).
 - b. Frame assembly: face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face].
 - c. Hollow metal panel: Same material, construction and finish as adjacent door assemblies.
 - d. Glazing bead: 18-gauge, 1.1 mm (0.042 in), screw applied with countersunk holes, butted corners. Install screws on non-secure side.
 - e. Glazing to comply with Section 08 80 00.
 - f. When required due to site access or shipping limitations, fabricate frame product for large openings in sections, with splice joints for field assembly. Provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

B. Hollow metal frames in moderate duty application

1. Frames:
 - a. Physical performance: Level B according to ANSI A250.4.
 - b. Metal thickness: 16-gauge, 1.34 mm (0.053 in).
 - c. Metal thickness for openings over 1219 mm (48 in): 14-gauge, 1.70 mm (0.067 in).
 - d. Frame assembly: Face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face], [Knockdown].
2. Side light, transom frame, borrowed light:
 - a. Metal thickness: 16-gauge, 1.34 mm (0.053 in).
 - b. Frame assembly: Face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face].
 - c. Hollow metal panel: Same material, construction and finish as adjacent door assemblies.
 - d. Glazing bead: 18-gauge, 1.1 mm (0.042 in), screw applied with countersunk holes, butted corners. Install screws on non-secure side.
 - e. Glazing to comply with Section 08 80 00.
 - f. When required due to site access or shipping limitations, fabricate frame product for large openings in sections, with splice joints for field assembly. Provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
3. Exterior frame, side light, transom frame, borrowed light:

- a. Provide thermal break frame profile.

C. Hollow metal frames in heavy duty application

1. Frames:

- a. Physical performance: Level A according to ANSI A250.4.
- b. Metal thickness: 16-gauge, 1.34 mm (0.053 in).
- c. Metal thickness for openings over 1219 mm (48 in): 14-gauge, 1.70 mm (0.067 in).
- d. Frame assembly: Face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face], Knockdown frames are not acceptable.

2. Side light, transom frame, borrowed light:

- a. Metal thickness: 16-gauge, 1.34 mm (0.053 in).
- b. Frame assembly: Face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face].
- c. Hollow metal panel: Same material, construction and finish as adjacent door assemblies.
- d. Glazing bead: 18-gauge, 1.1 mm (0.042 in), screw applied with countersunk holes, butted corners. Install screws on non-secure side.
- e. Glazing to comply with Section 08 80 00.
- f. When required due to site access or shipping limitations, fabricate frame product for large openings in sections, with splice joints for field assembly. Provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

3. Exterior frame, side light, transom frame, borrowed light:

- a. Provide thermal break frame profile.

D. Hollow metal frames in maximum duty application

1. Frames:

- a. Physical performance: Level A according to ANSI A250.4.
- b. Metal thickness: 14-gauge, 1.70 mm (0.067 in).
- c. Metal thickness for openings over 1219 mm (48 in): 12-gauge, 2.36 mm (0.093 in).
- d. Frame assembly: Face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face], Knockdown frames are not acceptable.

2. Side light, transom frame, borrowed light:

- a. Metal thickness: 14-gauge, 1.70 mm (0.067 in).
- b. Frame assembly: Face welded, dressed smooth with seamless face. [Continuously welded through the entire profile, dressed smooth with seamless face].
- c. Hollow metal panel: Same material, construction and finish as adjacent door assemblies.

- d. Glazing bead: 16-gauge, 1.34 mm (0.053 in), screw applied with countersunk holes, butted corners. Install screws on non-secure side.
 - e. Glazing to comply with Section 08 80 00.
 - f. When required due to site access or shipping limitations, fabricate frame product for large openings in sections, with splice joints for field assembly. Provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
3. Exterior frame, side light, transom frame, borrowed light:
 - a. Provide thermal break frame profile.

2.6. SPLIT FRAME

- A. Frames:
 1. Physical performance: Level A according to ANSI A250.4.
 2. Metal thickness: 16-gauge, 1.34 mm (0.053 in).
 3. Two inter-lock type face-welded components, dressed smooth with seamless face.
- B. Side light, transom frame, borrowed light: Metal thickness: 16-gauge, 1.34 mm (0.053 in).
 1. Two inter-lock type face-welded components, dressed smooth with seamless face.
 2. Hollow metal panel: Same material, construction and finish as adjacent door assemblies.
 3. Glazing bead: 18-gauge, 1.1 mm (0.042 in), screw applied with countersunk holes, butted corners. Install screws on non-secure side.
 4. Glazing to comply with Section 08 80 00.
 5. When required due to site access or shipping limitations, fabricate frame product for large openings in sections, with splice joints for field assembly. Provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

2.7. ANCHORS

- A. Suitable for wall conditions
 1. Located close to hinge reinforcements and at the same height on strike jamb. Quantity: 2 per jamb up to 1,524 mm (60 in) of door opening height, one additional anchor for each additional 762 mm (30 in) of door height (or fraction thereof).
 2. Provide a welded adjustable floor anchor at the bottom of each jamb on welded frames; same material as frame and with 2 holes for bolting to floor.
 3. Masonry anchors: Provide T-strap wall anchors, minimum 16-gauge, 1.34 mm (0.053 in).
 4. Existing wall anchors: Minimum 18-gauge, 1.1 mm (0.042 in), spot welded to the frame.
 5. Steel/wood stud anchors: Minimum 18-gauge, 1.1 mm (0.042 in). Provide steel snap-in or welded in "Z" type stud anchors.
 6. Knockdown frame: Adjustable compression anchors and L brackets spot welded to back of frame.

2.8. SPECIAL PROFILES

- A. Terminated stops: Where specified, shall be capped at heights as shown on the approved submittal drawings, and jamb joints below terminated stops shall be welded, filled and ground smooth so that there are no visible seams. Provide terminated stops 152 mm (6 in) above finish floor with a 45 [90]-degree angle cut.

2.9. SPECIALTY ASSEMBLIES

- A. Acoustical assemblies:

1. As indicated on the door and frame schedule, fabricate door and frame to comply with a minimum STC value of [XX] according to ASTM E90.
- B. Windstorm assemblies:
 1. As indicated on the door and frame schedule, fabricate door and frame to comply with ASTM A250.13, Class 1.
- 2.10. CLEARANCES
 - A. On fire-rated openings: Comply with NFPA 80
 - B. On non-fire rated openings, the clearance shall be 3 mm (1/8 in) between the door and frame and between meeting edges of a pair of doors. The clearance between the bottom of the door and the bottom of the frame shall be 19 mm (3/4 in) without threshold.
- 2.11. MANUFACTURING TOLERANCES
 - A. Frame:
 1. Width and height: +1.6 mm (1/16 in), -0.8 mm (-1/32 in)
 2. Face, stop and rabbet: +/- 0.8 mm (+/- 1/32 in)
 3. Jamb depth: +/- 1.6 mm (+/- 1/16 in),
 - B. Door:
 1. Width and height: +/- 1.2 mm (+/- 3/64 in)
 2. Thickness: +/- 1.6 mm (+/- 1/16 in)
 3. Edge flatness: 1.6 mm (1/16 in) maximum
 4. Surface flatness: 3.1 mm (1/8 in) maximum
 5. Door twist: +/- 1.6 mm (+/- 1/16 in)
 - C. Hardware:
 1. Cutouts: Template dimension +0.38 mm (+0.015 in)
 2. Location: +/- 0.8 mm (+/- 1/32 in)
 3. Between hinge centerlines: +/- 0.4 mm (+/- 1/64)
- 2.12. FIRE-RATED OPENINGS
 - A. Manufacture doors and frames as successfully tested in accordance with:
 1. NFPA 80
 2. NFPA 252
 3. NFPA 257
 4. UL 10C
 - B. Identify each product with a fire label from one of the following testing agency: Underwriters Laboratories, Warnock Hersey (ITS).
- 2.13. FRAME HARDWARE PREPARATION
 - A. Factory to prepare hollow metal frame to receive template mortised hardware; include cut-outs, reinforcement, mortising, drilling, and tapping according to the Door and Hardware Schedule and templates.
 - B. Surface applied hardware: Factory reinforced only, 12-gauge, 2.36 mm (0.093 in).
 - C. Hinge and pivot reinforcements: 10-gauge, 3.12 mm (0.123 in) high frequency hinge reinforcements, with a flange [7-gauge, 4.24 mm (0.167 in) flat hinge reinforcements].
 - D. Strike reinforcement: 16-gauge, 1.34 mm (0.053 in) [12-gauge, 2.36 mm (0.093 in)].
 - E. Closer reinforcement: 12-gauge, 2.36 mm (0.093 in).
 - F. Other reinforcements: 16-gauge, 1.34 mm (0.053 in) [12-gauge, 2.36 mm (0.093 in)].
- 2.14. DOOR HARDWARE PREPARATION

- A. Factory to prepare hollow metal door to receive template mortised hardware; include cut-outs, reinforcement, mortising, drilling, and tapping according to the Door and Hardware Schedule and templates.
- B. Surface applied hardware: Factory reinforced only, 16-gauge, 1.34 mm (0.053 in), [12-gauge; 2.36 mm (0.093 in)].
- C. Hinge and pivot reinforcements: 10-gauge, 3.12 mm (0.123 in) high frequency hinge reinforcements, with a flange [7-gauge, 4.24 mm (0.167 in) flat hinge reinforcements.
- D. Lock front reinforcement: 12-gauge, 2.36 mm (0.093 in).
- E. Flush bolt reinforcement: 12-gauge, 2.36 mm (0.093 in).
- F. Closer reinforcement: 16-gauge, 1.34 mm (0.053 in) [12-gauge, 2.36 mm (0.093 in)].
- G. Other reinforcements: 16-gauge, 1.34 mm (0.053 in) [12-gauge, 2.36 mm (0.093 in)].

2.15. FINISHING

- A. Galvanized steel A40/A60: Factory applied primer to protect the area where zinc was removed in the welding process.
- B. Primer: Comply with ANSI A250.10.
- C. Factory prefinished doors and frames: Comply with ANSI A250.3.
 - 1. Select color from manufacturer's standard color chart [custom color selected by the Designer].
 - 2. Provide touch-up paint for field repairs

3. EXECUTION

3.1. EXAMINATION

- A. Inspect rough openings to detect problems that would prevent the proper installation of doors and frames.
- B. Rough openings shall be square, level and plumb with accurate dimensions.

3.2. INSTALLATION

- A. Remove temporary spreaders on welded frames before installation and verify frame dimensions, swing, fire rating and opening number.
- B. For grouted frames, apply on site a coat of bituminous coating inside the frame throat.
- C. Install doors and frames in accordance with:
 - 1. Approved door and hardware schedule
 - 2. Approved shop drawings
 - 3. Manufacturer's recommendations
 - 4. Local building codes
 - 5. NFPA 80
 - 6. NFPA 105
 - 7. ANSI/DHI A115.1G
 - 8. NAAMM HMMA 840
- D. Install STC assemblies per manufacturer's installation instructions.
- E. Install Windstorm assemblies per manufacturer's installation instructions.

3.3. ADJUSTING, CLEANING AND PROTECTION

- A. Repair or replace damaged products.
- B. Correct defects in installation.
- C. Clean area in accordance with Section 01 74 00.

- D. Protect doors and frames until transfer of the building to the Owner.

3.4. INSPECTION

- A. Inspection of fire rated openings
 1. Comply with NFPA 80 requirements.
 2. Fire door assemblies shall be inspected and tested by an individual with knowledge and understanding of the operating components of the type of door. This person must confirm the door assembly will perform its intended function when exposed to fire conditions.
 3. A report shall be written for the AHJ and shall be submitted to the Owner.
 4. All deficiencies must be corrected before turning keys to the Owner.

END OF THIS SECTION