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SECTION 08 11 13 STILELITE™ STEEL DOORS AND FRAMING

PART 1 - GENERAL

1.1 PRODUCTS PROVIDED UNDER THIS SECTION

- A. StileLite™ metal doors, swinging type, including [glass moldings and stops] as shown in the approved submittal drawings.
- B. Formed metal panels, fixed or removable, flush or rabbeted, similar in construction to hollow metal doors.
- C. Formed metal frames, transom frames, sidelight and window assemblies, including glass moldings and stops as shown in the approved submittal drawings.

1.2 RELATED SECTIONS

- A. Section 08 11 19 - Stainless Steel Doors and Frames
- B. Section 08 34 53 - Security Doors and Frames
- C. Section 08 34 73 - Sound Control Doors and Frames
- D. Section 08 71 00 - Door Hardware (including Weather Stripping and Seals)
- E. Section 08 80 00 - Glazing

1.3 REFERENCES

- A. ANSI/SDI A250.4, Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Hardware Reinforcings
- B. ANSI/SDI A250.10, Standard Test Procedure and Acceptance Criteria for Prime Painted Steel Sur- faces for Steel Doors and Frames
- C. ANSI/NAAMM HMMA 801, Glossary of Terms for Hollow Metal Doors and Frames
- D. ANSI/NAAMM HMMA 841, Tolerances and Clearances for Commercial Hollow Metal Doors and Frames
- E. ANSI/NAAMM HMMA 866, Guide Specifications for Stainless Steel Hollow Metal Doors and Frames
- F. ANSI/NFPA 80 , Standard for Fire Doors and Other Opening Protectives
- G. ANSI/NFPA 105, Standard for the Installation of Smoke Door Assemblies and Other Opening Pro- tectives.



- H. ANSI/NFPA 252, Standard Methods of Fire Tests of Door Assemblies
- I. ANSI/NFPA 257, Standard Fire Test for Windows and Glass Block Assemblies
- J. ANSI/UL 9, Fire Test of Window Assemblies
- K. ANSI/UL 10C, Positive Pressure Fire Tests of Door Assemblies
- L. ANSI/UL 1784, Air Leakage Test of Door Assemblies
- M. ASTM A 653/A 653M, Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- N. ASTM A 1008/A 1008M, Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High Strength Low-Alloy and High Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
- O. ASTM A 1011/A 1011M, Specification for Steel, Sheet, and Strip, Hot-Rolled, Carbon, Structural, High Strength Low-Alloy and High Strength Low-Alloy with Improved Formability and Ultra High Strength
- P. ASTM C 143/A143M, Test Method for Slump of Hydraulic-Cement Concrete
- Q. CAN/ULC-S104, Standard Method for Fire Test of Door Assemblies
- R. CAN4-S106, Standard Method for Fire Test of Window and Glass Block Assemblies
- S. NAAMM HMMA 802, Manufacturing of Hollow Metal Doors and Frames
- T. NAAMM HMMA 810, Hollow Metal Doors
- U. NAAMM HMMA 810 TN01, Defining Undercuts of Doors
- V. NAAMM HMMA 820, Hollow Metal Frames
- W. NAAMM HMMA 820 TN02, Continuously Welded Frames

1.4 TESTING AND PERFORMANCE

- A. Physical Endurance for Steel Doors and Hardware Reinforcements
 - 1. Test a 3 ft. x 7 ft. (914 mm x 2134 mm), 1.75 in. (44 mm) thick nominal size door representative of the construction and material to be provided.
 - 2. Test in accordance with ANSI/SDI A250.4, Cycle and Twist Test procedure.
 - a. Cycle Test Acceptance Criteria:
 - i. Doors specified with 0.053 in. (1.3 mm) and thicker face sheets tested to 4,000,000 cycles.
 - ii. Doors specified with 0.042 in. (1.0 mm) minimum thick face sheets tested to Level A (1,000,000 cycles).
 - b. Twist Test Acceptance Criteria: Maximum deflection under 300 pound (136.1 kg) load.



- i. 4,000,000 cycle-tested doors not to exceed 0.625 in. (15.8 mm) deflection and maximum permanent deflection not to exceed 0.062 in. (1.5 mm).
 - ii. 1,000,000 cycle-tested doors not to exceed 1.25 in. (31.7 mm) deflection and maximum permanent deflection not to exceed 0.125 in. (3.1 mm).
 3. Provide Verification of Compliance from an Independent 3rd party which includes a description of the test specimen, procedures used in testing, and indicate compliance with the acceptance criteria of the standard.
 - B. Labeled Fire-Rated and/or Smoke Control Door and Frame Product
 1. Where determined and scheduled by the Architect;
 - a. Provide Listed or Classified doors, panels, frames, transom frames, sidelight, borrowed light and window assemblies bearing the label of a testing agency having a factory inspection service for openings requiring fire protection and/or smoke control ratings.
 - b. Test doors, panels, frames, transom frames and sidelight assemblies in accordance with [ANSI/NFPA 252] [CAN/ULC-S104] [ANSI/UL 10C] [and/or] [ANSI/UL 1784].
 - C. Prime Paint Performance
 1. Sheet steel specimens, with the product manufacturer's production primer, replicating finish 'as shipped', tested in accordance with ANSI/SDI A250.10
 2. Provide Verification of Compliance from an Independent 3rd party which include a description of the test specimen, procedures used in testing, and indicate compliance with the acceptance criteria of the standard.
- 1.5 QUALITY ASSURANCE**
 - A. Manufacturer's Qualifications
 1. Provide evidence of having personnel and plant equipment capable of fabricating hollow metal door and frame product of the types specified.
 2. Provide evidence of having a written quality control system in place.
 - B. Quality Criteria
 1. Compliance with Section 1.05 is required for all door and frame product provided under this Section.
 2. Fabricate in accordance with the approved submittal drawings.
 3. Meet fabrication methods and product quality standards set by the Hollow Metal Manufacturers Association, HMMA, a division of the National Association of Architectural Metal Manufacturers, NAAMM, as set forth in the contract documents and NAAMM's HMMA 800 through 850 Series documents.



1.6 SUBMITTALS

- A. Submittal Drawings
 - 1. Show dimensioned door and frame product elevations and sections.
 - 2. Show listing of opening descriptions including locations, material thicknesses, and anchors.
 - 3. Show location and details of openings.
 - 4. Provide manufacturer's recommended installation instructions and procedures.
- B. Samples, upon request, provide the following.
 - 1. Door: 1 ft. x 1 ft. (305 mm x 305 mm) corner section with hinge preparation showing top and internal construction. Frame: 1 ft. x 1 ft. (305 mm x 305 mm) section showing assembled corner joint at head and jamb. Include hinge reinforcement [and grout guard] in one rabbet. When glazed frame product is specified, apply and install glazing stop as specified in the opposite rabbet. Apply glazing stop to both head and jamb section to show their intersection.
 - 2. All samples submitted must represent in all respects the minimum quality of work to be furnished by the manufacturer. Do not fabricate any work represented by the samples until the samples are approved. Any deviation of fabrication quality compared to the approved samples is cause for rejection of the work.
- C. Contractor responsible for coordination and installation of products covered under this Section will;
 - 1. Verify and provide to the manufacturer, actual opening sizes and site conditions by field measurements before fabrication. Coordinate field measurements with fabrication and construction schedules to avoid delays.
 - 2. Verify that substrate conditions, whether existing or installed under other Sections, are as detailed in the Architect's drawings, and are acceptable for product installation in accordance with the manufacturer's instructions.
- D. Reflect measurements and conditions determined under Section 1.07.C in submittal documents and manufacture product accordingly.
- E. Do not proceed with fabrication without receipt of approved submittal drawings and approved hard- ware schedules.
- F. Contractor responsible for the coordination of procuring products provided under this Section and Section 1.03 - Related Sections is hereby instructed to comply with the hollow metal manufacturer's ordering instructions and lead time requirements to avoid delays.

PART 2 - PRODUCTS



21 STILELITE™ METAL DOORS

A. Materials

1. Steel

- a. Cold-rolled steel conforming to ASTM A 1008/A 1008M, CS, Type B
- b. Hot-rolled, pickled and oiled (HRPO) steel conforming to ASTM A 1011/A 1011M, CS, Type B
- c. Zinc-coated steel conforming to ASTM A 653/A 653M, CS, Type B

B. Construction

1. Fabricate types, sizes, and construction, in accordance with the contract documents, and meeting the performance requirements of Section 1.05.
2. Door-face sheet thickness and steel type.
 - a. Interior doors constructed of 0.042 in. (1.06 mm) minimum thickness commercial quality steel sheet, free of scale, pitting or surface defects, conforming to; ASTM A 1008/A 1008M for cold-rolled steel; ASTM A 653/A 653M, CS, Type B, Coating Designation A25 (ZF75) for zinc-coated steel; or ASTM A 1011/A 1011M, CS, Type B, for hot-rolled pickled and oiled steel.
 - b. Exterior doors constructed of 0.053 in. (1.3 mm) minimum thickness zinc-coated steel conforming to ASTM A 653/A653M, CS, Type B, Coating Designation A60 (ZF180) or G60 (Z180).
3. Join face sheets at their vertical edges by a continuous weld extending the full height of the door, with no visible seams on their faces or vertical edges.
4. Fabricate doors with minimum nominal door thickness of 1.75 in. (44 mm). Fabricate doors neat in appearance and free from warpage or buckle. Bend edges true and straight, and of minimum radius for the thickness of metal used.
5. Prior to shipment mark each door with an identification number as shown on the approved submittal drawings.
6. Stiffen doors using continuous vertically formed steel sections which, upon assembly, span the full thickness of the interior space between door faces. Fabricate stiffeners from 0.026 in. (0.6 mm) minimum thickness steel and space them so that the vertical interior webs are no more than 6 in. (152 mm) apart. Securely fasten stiffeners to both face sheets by spot welds spaced a maximum of 5 in. (127 mm) on center vertically. Fill spaces between stiffeners with fiberglass or mineral rock wool batt-type material.
 - a. Where determined and scheduled by the Architect, insulate temperature rise rated (TRR) fire doors to limit the temperature rise on the “unexposed”



side of the door, as required by the governing building code requirements.

7. Close the top and bottom edges with a continuous steel channel, not less than 0.053 in. (1.3 mm) thickness, welded to both face sheets.
8. Close exterior doors, or doors where otherwise scheduled by the Architect, flush at the top edge. Where required for attachment for weather-stripping, provide a flush steel closure channel at the bottom edge. Provide openings in the bottom closure channel of exterior doors to permit the escape of entrapped moisture.
9. Provide edge profiles on both vertical edges of doors as follows, unless hardware dictates otherwise:
 - a. Single acting doors - beveled .125 in. (3.1 mm) in 2 in. (50.8 mm) profile
 - b. Double acting doors - rounded on 2.125 in. (54 mm) radius
10. Hardware Reinforcements and Preparations
 - a. Weld all hardware reinforcements to door.
 - b. Mortise, reinforce, drill and tap doors at the factory for templated hardware only, in accordance with the approved hardware schedule and templates provided by the hardware supplier.
 - c. Mortise and reinforce doors for anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware. Drilling and tapping, by others.
 - d. Reinforce doors for surface mounted hardware or continuous hinges. Drilling and tapping, by others
 - e. Steel thickness for hardware reinforcements to be the manufacturer's standard as required to adequately support the door and hardware, but not less than:
 - i. Full mortise hinges and pivots.....0.167 in. (4.24 mm) or 0.123 in. (3.12 mm) angle or channel shaped type
 - ii. Lock fronts, mortised latching devices and strikes.....0.093 in. (2.3 mm) or 0.053 in. (1.34 mm) unitized reinforcement with extruded tapped holes that provide equivalent number of thread as 0.093 in. (2.3 mm)
 - iii. Concealed holders and surface mounted closers.....0.093 in. (2.3 mm)
 - iv. Internal reinforcements for other surface-mounted hardware.....0.067 in. (1.7 mm)
 - f. Where power operated hardware is indicated on the approved hardware schedule, provide access from hinge edge to device in accordance with the templates provided.



11. Glazing Moldings and Stops

- a. Where specified or scheduled, provide doors with steel moldings to secure glazing materials furnished and installed in the field by others, in accordance with glazing sizes and thickness shown in the contract documents.
- b. Provide fixed glazing molding or integral stops, 0.032 in. (0.81 mm) minimum thickness, located on the secure side of the door, as designated on the Architect's drawings and/or door schedules.
- c. Fabricate channel shaped removable glazing stops not less than 0.032 in. (0.8 mm) material thickness, with tight fitting butt or mitered corners, and secure with #6 minimum, corrosion resistant countersunk sheet metal screws.
- d. Treat metal surfaces to which removable glazing stops are applied and the inside of the removable glazing stops for maximum paint adhesion and coat with a rust inhibitive primer prior to installation in the door. Glazing stops fabricated from zinc-coated steel conforming to ASTM A 653/A 653M, A25 (ZF75) for interior doors, A60 (ZF180) for exterior openings need not be primed on the inside.
- e. Prepare fire-protection rated doors for listed glazing as required in accordance with the door manufacturer's fire rating procedure.

2.2 STILELITE™ METAL FRAMES AND PANELS

- A. Metal frames and panels, 1.75 in. (44 mm) nominal thickness, of the same materials and construction as specified in Section 2.01 of this specification.
- B. Finish metal frames and panels as specified in Section 2.06 of this specification.
 1. Steel
 - a. Cold-rolled steel conforming to ASTM A 1008/A 1008M, CS, Type B
 - b. Hot-rolled, pickled and oiled (HRPO) steel conforming to ASTM A 1011/A 1011M, CS, Type B
 - c. Zinc-coated steel conforming to ASTM A 653/A 653M, CS, Type B
- C. Construction
 1. Fabricate frame product as welded units of the sizes and types shown on the approved submittal drawings. Frame product shall be constructed in accordance with the contract documents and meet the performance criteria specified in Section 1.05. Knocked-down frames are not acceptable.
 2. Profile thickness and steel type:



- a. Interior Frame Product: Construct profiles of commercial quality steel sheet, free of scale, pitting or surface defects; cold-rolled steel conforming to ASTM A 1008/A 1008M; zinc-coated steel conforming to ASTM A 653/A 653M, CS, Type B, Coating Designation A25 (ZF75); or hot-rolled, pickled and oiled steel conforming to ASTM A 1011/A 1011M, 0.053 in. (1.3 mm) minimum thickness. Fabricate frame product from 0.067 in. (1.7 mm) minimum thickness for single door openings exceeding 4 ft. (1219 mm) in width, pairs with either door exceeding 4 ft. (1219 mm) in width and for nominal door opening height exceeding 10 ft. (3048 mm).
 - b. Exterior Frame Product: Construct profiles from zinc coated steel conforming to ASTM A 653/A 653M, CS, Type B, Coating Designation A60 (ZF180) or G60 (Z180), 0.053 in. (1.3 mm) minimum thickness. Fabricate frame product from 0.067 in. (1.7 mm) minimum thickness for single door openings exceeding 4 ft. (1219 mm) in width, pairs with either door exceeding 4 ft. (1219 mm) in width and for nominal door opening height exceeding 10 ft. (3048 mm).
3. Fabricate all finished work neat in appearance, square, and free of defects, warps and buckles. Pressed steel members shall be straight and of uniform profile throughout their lengths.
4. Provide jamb, header, mullion and sill profiles in accordance with the frame schedule and as shown on the approved submittal drawings.
5. Fabricate corner joints with all contact edges closed tight, with faces mitered where the two joining members are equal, and with stops mitered or butted.
6. Welding
 - a. Perimeter face joints (flush or indented): Continuously welded internally or externally with flush face joints finished smooth with seamless faces. Continuously weld internally the rabbets and soffits.
 - b. Internal flush face joints: Continuously welded and finished smooth with seamless faces.
 - c. Members at internal indented intersections: Securely welded to concealed reinforcements, and have hairline face seams.
 - d. All other intersection elements: Hairline seams.
7. Fabricate frame product with stop heights of 0.625 in. (15.8 mm) minimum.
8. Cap cut-off stops, where specified, at heights as shown on the approved submittal drawings, weld, fill and grind smooth so that there are no visible seams at the jamb joints below cut-off stops.
9. Prepare each door opening for single stud, resilient door silencers, three (3) per strike jamb for single door openings, two (2) per head for pairs, except on gasketed or



weather stripped frame product. Silencers supplied and installed by others.

10. When shipping limitations or site access so dictate, or when advised by the contractor responsible for coordination or installation, fabricate frame product for large openings in sections designated for assembly in the field. Install alignment plates or angles at each joint of the same material and thickness as the frame in accordance with approved submittal drawings.. Assemble sections, weld joints, grind smooth and prime paint by others under Section 06 11 00 or 09 2000.
11. Prior to shipment mark frame product with an identification number as shown on the approved submittal drawings.
12. Hardware Reinforcements and Preparations
 - a. Weld all hardware reinforcements to frame product.
 - b. Mortise, reinforce, drill and tap frame product at the factory for templated hardware only, in accordance with the approved hardware schedule and templates provided by the hardware supplier.
 - c. Mortise and reinforce frame product for anchor hinges, thrust pivots or non-templated mortised hardware. Drilling and tapping, by others.
 - d. Reinforce frame product for surface mounted hardware or continuous hinges. Drilling and tapping, by others.
 - e. Minimum thickness of hardware reinforcements;
 - i. Full mortised hinges and pivots.....0.167 in. x 1.25 in. x 10 in. length (4.2 mm x 31.7 mm x 254 mm)
 - ii. Strikes.....0.093 in. (2.3 mm) or 0.053 in. (1.3 mm) unitized reinforcement with extruded tapped holes that provide equivalent number of threads as 0.093 in. (2.3 mm)
 - iii. Flush bolts, closers, hold open arms, and other surface applied hardware.....0.093 in. (2.3 mm)
13. Where power operated hardware is indicated on the Architect's drawings or approved hardware schedule, provide prepared grout guards in accordance with the templates provided. Fabricate access plates, where required, of the same material, thickness and finish as the frame product, fastened with corrosion resistant screws. Secure access plates with a minimum of four (4) #8-32 machine screws or #6 sheet metal screws, spaced at 12 in. (305 mm) on center maximum.
14. Floor Anchors
 - a. Weld floor anchors inside jambs. Provide two (2) holes for fasteners supplied and installed by others under Section [06 10 00] [09 20 00].
 - b. Where specified or scheduled, provide adjustable floor anchors with no more than 2 in. (50.8 mm) height adjustment.



- c. For applications that do not permit the use of a floor anchor, substitute an additional jamb anchor at a location not to exceed 8 in. (204 mm) from the base of the jamb.
- d. Thickness of floor anchor; same as frame, minimum..

15. Jamb Anchors

- a. Provide frame product with anchorage appropriate to frame and wall construction.

- b. Masonry Type:

Provide steel adjustable jamb anchors of the strap and stirrup or T-strap type not less than

0.053 in. (1.34 mm) thickness or 0.156 in. (4 mm) diameter wire type, for frame product to be installed in new masonry walls. Straps; 2 in. x 10 in. (50 mm x 254 mm) in size minimum, corrugated and/or perforated. Place jamb anchors at a maximum of 18 in. (457 mm) from top and bottom of openings. Minimum number of anchors, spaced at maximum of 32 in. (813 mm) on center, provided on each jamb based on the over-all frame height.

- i. Up to 60 in. (1524 mm).....2 anchors
- ii. Greater than 60 in. (1524 mm)
up to 90 in. (2286 mm).....3 anchors
- iii. Greater than 90 in. (2286 mm)
up to 96 in. (2438 mm).....4 anchors
- iv. Greater than 96 in. (2438 mm).....4 anchors plus one for each
24 in.(610 mm) or fraction thereof, spaced at 24 in. (610 mm) maximum
between anchors

- c. Dry Wall Type

Provide steel jamb anchors of suitable design, not less than 0.042 in. (1.06 mm) thickness, welded inside each jamb for frame product installed in drywall partitions. Place jamb anchors at a maximum of 18 in. (457 mm) from top and bottom of openings. Minimum number of anchors spaced at a maximum of 32 in. (813 mm) on center, provided on each jamb, based on the over-all frame height:

- i. Up to 60 in. (1524 mm).....3 anchors
- ii. Greater than 60 in. (1524 mm)
up to 90 in. (2286 mm).....4 anchors
- iii. Greater than 90 in. (2286 mm)
up to 96 in. (2438mm).....5 anchors
- iv. Greater than 96 in. (2438 mm).....5 anchors plus one for each



24 in. (610mm) or fraction thereof, spaced at 24 in. (610 mm) maximum between anchors

d. Expansion Bolt Type

Prepare frame product for installation in existing masonry or concrete walls for expansion bolt type anchors. Provide a countersunk or dimpled hole for a 0.375 in. (9.5 mm) diameter flat head bolt and a spacer welded within the frame profile. Locate anchors a maximum of 6 in. (152 mm) from the top and bottom of the frame, with intermediate spacing at a maximum of 26 in. (660 mm) on center. Bolts and shields for such anchors provided and installed by others under Section 06 10 00.

e. Other Anchor Types

Construct and provide frame product to be installed in pre-finished concrete, masonry or steel openings, with anchoring systems of suitable design and quantity as shown on the approved submittal drawings. Fasteners for such anchors shall be provided and installed by others under Section [03 30 00] [04 20 00].

16. Fabricate frame product installed in masonry walls with door openings greater than 48 in. (1219 mm) in width with a steel angle or channel stiffener factory welded into the head. Provide stiffeners not less than 0.093 in. (2.3 mm) in thickness, not longer than the door opening width. Stiffeners and frame product are not be used as lintels or load bearing members.

17. Attach grout guards fabricated from not less than 0.016 in. (0.4 mm) thick steel at hardware mortises on frame product to be grouted.

18. For all door openings in frame product provide a temporary steel spreader welded to the base of the jambs or mullions to serve as bracing during shipping, and handling. Spreaders are not be used for installation.

19. In-Fill Panels

- a. Where specified or scheduled, provided frame product with in-fill panels secured to frame sections with removable steel stops.
- b. For non-labeled frame product, construct in-fill panels from 0.032 in. (0.8 mm) minimum thick steel, of the same type specified for the frame product, laminated to each face of the manufacturer's standard solid backing.
- c. For fire-rated frame product, construct in-fill panels from 0.032 in. (0.8 mm) minimum sheet steel, of the same type specified for the frame product, laminated to each face of a solid approved backing.

20. Removable Glazing Stops

- a. Where specified, provide frame product with removable stops to secure



glazing material or in-fill panels. Glazing materials are furnished and installed in the field by others, in accordance with glazing sizes and thickness shown in the contract documents.

- b. Fabricate removable steel channel glazing from not less than 0.032 in. (0.8 mm) thick, butted at corners and secured to the frame section using #6 minimum, corrosion resistant countersunk sheet metal screws.
- c. Treat the frame section underneath the glazing stops and the inside of the glazing stops for maximum paint adhesion and coat with a rust inhibitive primer prior to installation in the opening. Glazing stops fabricated from zinc-coated steel conforming to ASTM A 653/A 653M, A25 (ZF75) for interior frames, A60 (ZF180) or G60 (Z180) for exterior openings need not be primed on the inside.

2.3 MANUFACTURING TOLERANCES

A. Maintain manufacturing tolerances within the following limits and in accordance with ANSI/NAAMM HMMA 841:

1. Frame Product for Singles or Pairs of Doors

- a. Width, measured between rabbets at the head: nominal opening width + 0.0625 in. (+ 1.5 mm), - 0.03125 in. (- 0.8 mm)
- b. Height (total length of jamb rabbet): nominal opening height + 0.0625 in. (+ 1.5 mm), - 0.03125 in. (- 0.8 mm)
 - c. Cross sectional profile dimensions (see Figure 2):
 - i. Face..... ± 0.0313 in. (0.8 mm)
 - ii. Stop..... ± 0.0313 in. (0.8 mm)
 - iii. Rabbet..... ± 0.0313 in. (0.8 mm)
 - iv. Depth..... ± 0.0625 in. (1.5 mm)
 - v. Throat..... ± 0.0938 in (2.3 mm)

2. Doors

Tolerances for actual hollow metal door size are as follows:

- a. Width..... ± 0.0468 in. (1.2 mm)
- b. Height..... ± 0.0468 in. (1.2 mm)
- c. Thickness..... ± 0.0625 in. (1.5 mm)
- d. Perimeter Flatness..... 0.0625 in. (1.5 mm) maximum
- e. Surface Flatness..... 0.125 in (3.1 mm) maximum



- f. Twist..... 0.0625 in. (1.5 mm) maximum
- g. Squareness..... 0.0625 in. (1.5 mm) maximum

3. Hardware

- a. Cutouts.....Template dimensions +0.0156 in. (0.4mm), - 0
- b. Location..... ± 0.0313 in. (0.8 mm)
- c. Between hinge centerlines..... ± 0.0156 in (0.4 mm)
- d. Face cutout for hinges..... + 0.0625 in.(1.5 mm) – 0
- e. Mortise depth of reinforcement..... ± 0.0156 in (0.4 mm)

2.4 HARDWARE LOCATIONS

A. The location of hardware on doors and frame product shall be as listed below. All dimensions, except the hinge locations, are referenced from the floor as defined in Section 3.03.B.3.

1. Hinges

- a. Top..... 5 in. (127 mm) from underside of frame rabbet at door opening to top of hinge
- b. Bottom..... 10 in. (254 mm) from floor to bottom of hinge
- c. Intermediate..... Centered between top and bottom hinges
- d. On dutch doors..... 5 in. (127 mm) from underside of frame rabbet at door opening to top of upper hinge; 10 in. (254 mm) from floor to bottom of lower hinge; and 5 in. (127 mm) from split line to top and bottom of lower and upper intermediate hinges, respectively

2. Locks and latches.....38 in. (965 mm) to centerline of knob or lever shaft

3. Deadlocks.....46 in. (1168 mm) to centerline of cylinder

4. Exit hardware.....Centerline of cross bar as shown on hardware template or as shown on approved contract documents..

5. Door pulls.....42 in. (1066 mm) to center of grip

6. Push/pull bars.....42 in. (1066 mm) to centerline of bar



- 7. Hospital latch arm pulls.....45 in. (1143 mm) to centerline
- 8. Push plates.....46 in. (1168 mm) to centerline of plate
- 9. Roller latches.....46 in. (1168 mm) to centerline of latch

2.5 FINISH

- A. After fabrication, fill and sand all tool marks and surface imperfections as required to make face sheets, continuously welded vertical door edges and weld joints free from irregularities and dressed smooth.
- B. After appropriate metal preparation to ensure maximum paint adhesion, provide a factory applied rust inhibitive direct to metal (DTM) primer coating to all exposed surfaces of door and frame product manufactured from cold-rolled, hot-rolled, or G60 (Z180) zinc-coated. Meet the performance requirements of Section 1.05.C.
- C. All primer must be cured prior to shipment.

PART 3 - EXECUTION

3.1 SITE STORAGE AND PROTECTION OF MATERIALS

- A. Responsibilities of the contractor responsible for receiving hollow metal door and frame product;
 - 1. Remove wraps or covers upon delivery at the building site and ensure that any scratches or disfigurement caused by shipping or handling are promptly cleaned and touched up with a rust inhibitive 'Direct to Metal' (DTM) primer.
 - 2. Ensure that materials are properly stored on planks or dunnage in a dry location. Store doors and frame product in a vertical position, spaced by blocking. Figure 3 illustrates recommended storage positioning. Cover materials to protect them from damage but in such a manner as to permit air circulation.

3.2 INSTALLATION

- A. The installer is responsible for performing the following;:
 - 1. Prior to installation;
 - a. Check the area of floor on which the frame product is to be installed, and within the path of the door swing, for flatness and correct if necessary.
 - b. Check doors and frame product for correct size, swing, fire rating and opening number. If product does not comply with contract documents, do not install and contact the supplier.
 - c. Isolate and protect all interior surfaces of perimeter frame product sections to be installed in masonry or concrete walls from grout and antifreeze agents.



- d. Remove temporary spreaders.
 - e. Refinish to match original, any marks caused by spreader removal.
2. During the setting of frame product check and correct as necessary for opening width, opening height, squareness, alignment, twist and plumbness. Maintain installation tolerances within the following limits.
- a. Opening Width..... measured from rabbet to rabbet at top, middle and bottom of frame + 0.0625 in (1.5 mm), – 0.0313 in (0.8 mm)
 - b. Opening Height..... measured vertically between the frame head rabbet and top of floor or bottom of frame minus jamb extension at each jamb and across the head; + 0.0625 in (1.5 mm), – 0.0313 in (0.8 mm)
 - c. Squareness..... measured at rabbet on a line from jamb, perpendicular to frame head; not to exceed 0.0625 in (1.5 mm)
 - d. Alignment..... measured at jambs on a horizontal line parallel to the plane of the face; not to exceed 0.0625 in (1.5 mm)
 - e. Twist.....measured at opposite face corners of jambs on parallel lines perpendicular to the plane of the door rabbet; not to exceed 0.0625 in (1.5 mm)
 - f. Plumbness.....measured at the jambs on a perpendicular line from the head to the floor; not to exceed 0.0625 in (1.5 mm)
3. The details in Figure 4 illustrate the method of measuring the above specified tolerances.
4. Grout guards and junction boxes are intended to protect hardware mortises and tapped holes from masonry grout of 4 in. (101 mm) maximum slump consistency which is hand troweled in place. If a lighter consistency grout (greater than 4 in. (101 mm) slump when tested in accordance with ASTM C 143/C 143M) is to be used, special precautions must be taken in the field by the installer to protect the aforementioned.
5. Frame products are not intended or designed to act as forms for grout or concrete. Take precautions otherwise to ensure that frames are not deformed or damaged by the hydraulic forces that occur during this process.
6. Keep steel surfaces free of grout, tar, and/or other bonding materials or sealers. Promptly clean grout, tar, and/or other bonding materials or sealers off of doors and frame product. If the primer is removed, damaged or negatively affected by this process, promptly finished smooth, cleaned, treated for maximum paint adhesion and touched up with a rust inhibitive primer comparable to and compatible with the shop applied primer and finish paint specified in Section 09 90 00. All touch-up primer and finish paint must be formulated for Direct to Metal (DTM) application.



- 7. Install labeled fire doors and frame product in accordance with the terms of their listings, ANSI/ NFPA 80 or the local Authority Having Jurisdiction.
- 8. Maintain proper door edge clearances in accordance with Section 3.03, except for special conditions otherwise noted. Where necessary, metal hinge shims, furnished by the installer, are permitted to maintain clearances.
- 9. Exposed hollow metal surfaces which have been scratched or otherwise marred during installation, cleaning, and/or field welding, shall promptly be finished smooth, cleaned, treated for maximum paint adhesion and touched up with a rust inhibitive primer comparable to and compatible with the shop applied primer and finish paint specified in Section 09 90 00. All touch-up primer and finish paint must be formulated for Direct to Metal (DTM) application.
- 10. Install hardware in accordance with hardware manufacturer's templates and instructions.
- 11. Finish paint in accordance with Section 09 90 00.
- 12. Install door silencers.
- 13. Install glazing materials in accordance with Section 08 80 00.

3.3 CLEARANCES

- A. Ensure that the edge clearance for swinging hollow metal doors provides for the functional operation of the assembly and does not exceed the following:
 - 1. Between doors and frame product at head and jamb.....0.125 in (3.1 mm) +/- 0.0625 in (1.5 mm)
 - 2. Between edges of pairs of doors.....0.125 in (3.1 mm) +/- 0.0625 in (1.5 mm)
- B. Floor clearance for fire-protection rated swinging hollow metal doors shall not exceed 0.75 in (19.0 mm). Floor clearance shall be provided for the functional operation of all swinging hollow metal doors and shall not be less than 0.125 in (3.1 mm)

END OF SECTION

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