

GUIDE SPECIFICATIONS FOR COMMERCIAL HOLLOW METAL DOORS AND FRAMES

SEVENTH EDITION
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This standard was developed by representative members of and approved by the Hollow Metal Manufacturers Association Division (HMMA) of the National Association of Architectural Metal Manufacturers (NAAMM) to provide their opinion and guidance on the specification and use of swinging sound control hollow metal doors and frames. This standard contains advisory information only and is published as a public service by NAAMM and its HMMA Division.

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National Association of Architectural Metal Manufacturers

800 Roosevelt Road, Building C, Suite 312

Glen Ellyn, IL 60137

Tel: 1-630-942-6591 • Fax: 1-630-790-3095

www.naamm.org

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FOREWORD

These specifications have been prepared in accordance with the CSI recommended Master Format 2012 with Part 1 - General, Part 2 - Product and Part 3 - Execution. Guide specifications are intended to be used as the basis for developing project specifications and must be edited to fit specific project requirements. Inapplicable provisions should be deleted, appropriate selections should be made where there are choices, and provisions applicable to the project should be added where necessary. Options are shown in brackets. Notes, recommendations and instructions to Specifiers are given in italics at the start of or directly following the sections to which they apply. Notes that contain permissive language are not considered part of the standard. ASTM and other standards shall be deemed as that in affect on publication date of this Guide, unless specifically noted otherwise. When a more recent standard is available, the Specifier should verify its applicability to this Guide prior to its inclusion. While the CSI Section Format locates Delivery, Storage and Handling in Part 1, NAAMM standards include them under Part 3 – Execution.

Materials and fabrication methods are specified in detail in Part 2. Doors and frames manufactured in accordance with these specifications have successfully met the testing and performance requirements of Section 1.05. However, the materials and fabrication methods called for in these specifications, while providing an excellent guide, are not intended to restrict the use of other materials and methods where it can be demonstrated through the specific testing procedures in Section 1.05 that the construction can equal or exceed the performance levels specified. In order to ensure that a manufacturer's product meets the desired performance levels, the construction specifications must always include the Testing and Performance requirements of Section 1.05 and the Quality Assurance requirements of Section 1.06.

The values stated in inch-pound units are to be regarded as the standard. Corresponding metric values are included in parenthesis for reference purposes only.

This guide specification addresses the requirements for commercial steel stiffened hollow metal doors and frame products.

For hollow metal doors and frames subject to less rigorous use than commercial and institutional applications, give consideration to ANSI/NAAMM HMMA 860, "Guide Specifications for Hollow Metal Doors and Frames", or ANSI/NAAMM HMMA 867, "Guide Specifications for Commercial Laminated Core Hollow Metal Doors and Frames". If security is a factor, there are two hollow metal standards available - ANSI/NAAMM HMMA 862, "Guide Specifications for Commercial Security Hollow Metal Doors and Frames", and ANSI/NAAMM HMMA 863, "Guide Specifications for Detention Security Hollow Metal Doors and Frames". For acoustic applications consideration may be given to ANSI/NAAMM HMMA 865, "Guide Specifications for Sound Control Hollow Metal Doors and Frame Assemblies". For situations where corrosion resistance beyond that of typical commercial steel door and frame applications, or where specialized aesthetic appearance, are significant design criteria, consideration should be given to ANSI/NAAMM HMMA 866, "Guide Specifications for Stainless Steel Hollow Metal Doors and Frames".

CSI SECTION 08 11 13 HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

This Section includes commercial hollow metal products, including doors, panels, frames, transom frames, sidelight and window assemblies as shown in the contract documents.

1.02 PRODUCTS PROVIDED UNDER THIS SECTION

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

In this guide specification the term "frame product" is used to define, as, a group; frames, transom frames, sidelights, and window assemblies.

1.03 RELATED SECTIONS

- A. Section 01 66 00 - Product Storage and Handling
- B. Section 03 30 00 – Cast in Place Concrete
- C. Section 04 20 00 – Unit Masonry
- D. Section 05 10 00 - Structural Metal Framing (for Lintels, Posts, Columns or Other Load Bearing Elements)
- E. Section 06 11 00 - Wood Framing
- F. Section 08 11 19 - Stainless Steel Doors and Frames
- G. Section 08 34 53 - Security Doors and Frames
- H. Section 08 34 73 - Sound Control Doors and Frames
- I. Section 08 71 00 - Door Hardware (including Weather Stripping and Seals)
- J. Section 08 80 00 - Glazing
- K. Section 09 20 00 – Plaster and Gypsum Board (for the Installation of Commercial Hollow Metal Doors and Frames in Steel Stud Partitions).
- L. Section 09 90 00 - Painting and Coating
- M. Section 11 19 00 - Detention Equipment
- N. Section ____ - Field Measurements

This specification covers only those products listed in Section 1.02. Not included in Section 08 11 13 are builders or rough hardware of any kind, weather-stripping, gasketing, items furnished by others, field painting, and protection at the building site of products furnished under this Section.

1.04 REFERENCES

The Standards listed in this Guide are referenced by basic designation only. The edition of a Standard is deemed as that in affect on the publication date this Guide, unless specifically noted otherwise. If a more recent standard is available, the Specifier should verify its applicability to this Guide prior to its inclusion.

- 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 Surfaces 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 Protectives.
- 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/A 143M, 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 803, Steel Tables
- U. NAAMM HMMA 805, Recommended Selection and Usage Guide
- V. NAAMM HMMA 810, Hollow Metal Doors
- W. NAAMM HMMA 810 TN01, Defining Undercuts of Doors
- X. NAAMM HMMA 820, Hollow Metal Frames
- Y. NAAMM HMMA 820 TN01, Grouting Hollow Metal Frames
- Z. NAAMM HMMA 820 TN02, Continuously Welded Frames
- AA. NAAMM HMMA 830, Hardware Selection for Hollow Metal Doors and Frames
- AB. NAAMM HMMA 831, Recommended Hardware Locations for Hollow Metal Doors and Frames
- AC. NAAMM HMMA 840, Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames
- AD. NAAMM HMMA 840 TN01, Painting Hollow Metal Products

AE. NAAMM HMMA 850, Fire-Rated and Smoke Control Hollow Metal Door and Frame Products

The following standards are used only for neutral pressure fire test methods and should be deleted from project specifications when 'positive pressure' is required by the governing building code: CAN/ULC-S104 (1.04.R) and CAN4-S106 (1.04.S)

Conversely, ANSI/UL 10C (1.04.L) is used only for positive pressure fire tests and should be deleted from project specifications requiring neutral pressure fire tests.

ANSI/NFPA 252 (1.04.H), ANSI/NFPA 257 (1.04.I) and ANSI/UL 9 (1.04.J) reference both neutral pressure and 'positive pressure' fire test methods, and as such should be included in all project specifications, except those requiring compliance with Canadian Building Codes.

ANSI/UL 1784 (1.04.M) is used for US smoke control assembly testing and therefore should not be included in specifications requiring compliance with the Canadian Building Code.

Only project specifications requiring compliance with Canadian Building Codes should include CAN/ULC-S104 (1.04.R) and CAN4-S106 (1.04.S)

Refer to Appendix 4 for a list of the Standards Writing or Accreditation Organizations referenced in Section 1.04.

1.05 TESTING AND PERFORMANCE

A. Physical Endurance for Steel Doors and Hardware Reinforcings

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 include 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. Test borrowed light and window assemblies in accordance with [ANSI/UL9 or ANSI/NFPA 257] [CAN4-S106].

ANSI/UL 10C provides for positive pressure testing to accommodate the requirements of IBC jurisdictions and should be included only for such.

CAN/ULC-S104 and CAN4-S106 provide for 'neutral pressure' testing to accommodate the requirements of the Canadian Building Code jurisdictions and should be included only for such.

ANSI/NFPA 252, ANSI/NFPA 257 and ANSI/UL 9 cover both neutral and positive pressure testing and therefore should be included in all project specifications, except when compliance with Canadian Building Codes is required.

ANSI/UL 1784 provides for smoke control assembly testing required by the IBC and ANSI/NFPA 105 to accommodate these specific requirements and should be included only when required.

Include CAN/ULC-S104 and CAN4-S106 only for projects requiring conformance with Canadian Building Codes.

2. For any door or frame product specified by the Architect to be fire-rated, which cannot qualify for labeling due to design, hardware or other reason, advise the Architect, in the submittal documents. Advise the Architect when hardware, glazing or other options specified, unknown at the time of submittal document preparation, affect fire labeling eligibility.

The Specifier must ensure that all performance based criteria such as fire-protection rating, temperature-rise rating, smoke control for each opening are clearly detailed by the Architect on the project door schedules.

For additional information, refer to NAAMM HMMA 850, "Fire-Rated and Smoke Control Hollow Metal Door and Frame Products".

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.

1.06 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.

1.07 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.

2. 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.
 3. 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 hardware schedules.
- The approved submittal drawings and the approved hardware schedule are the versions that have been provided to the hollow metal manufacturer at the time of release for fabrication. These drawings and the schedule are considered part of the project construction documents. Insist upon receiving detailed templates along with approved submittal drawings to assure proper coordination between Contractor and installers.*
- 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

2.01 HOLLOW 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

ANSI and ASTM Standards no longer utilize 'gage' to define steel thickness. In this Specification steel is expressed in terms of minimum decimal inch (millimeter) thickness. Dimensions or sizes traditionally expressed in fractional inches are shown in decimal inches (millimeters). HMMA has developed a series of Tables, (NAAMM HMMA 803) included as Appendix 1 of this Specification, to summarize the imperial standards and their corresponding metric values.

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.