



Metal Magicians at Work....creating Doorways of Distinction for the Pathways of Tomorrow

SECTION 08 12 13.53 CUSTOM HOLLOW METAL FRAMES (RADIUSED, ARCHED, CHORDED, or SEGMENTED)

This Specification relies on verbiage relevant to Custom Hollow Metal Frames from ANSI/NAAMM HMMA-861. It is intended as an "editable" proprietary specification, not necessarily following the individual paragraph numbering of any other source. The Section Number is taken from the 2012 version of MasterFormat.

Specifier note: Include, add, or delete items marked "select" as applicable to this individual building. Items marked (other) allow the addition of relevant, specific requirements.

Specifier notes are for reference only and should be edited out of the finished specification.

Specifier selections should be edited out to retain only the pertinent selection.

PART 1 - GENERAL

1.1 SECTION INCLUDES

This Section includes commercial hollow metal products, including frames, transom and/or sidelight frames, and borrowed lights fabricated in other than a single, flat, linear plane as shown in the contract documents.

1.2 RELATED SECTIONS

01 56 00 Site Protection of Materials.

01 66 00 Site Storage of Materials.

03 30 00 Cast-in-place Concrete.

03 40 00 Precast Concrete.

03 60 00 Grouting.

04 00 00 Masonry Includes 04 05 16 and 04 00 20.

05 10 00 Lintels, Posts, Columns or Other Load Bearing Elements.

06 10 00 Installation of Commercial Hollow Metal Doors and Frames into Other than Steel Stud Partitions.

08 12 19 Stainless-Steel Frames. **Specifier Note: Delete if not relevant to Project scope.**

Individualized specification for this product is on www.megametusa.com under Stainless Door.

08 34 49 Radiation Shielding Doors and Frames. **Specifier Note: Delete if not relevant to Project scope. Individualized specification for this product is on www.megametusa.com under X-Ray Door.**

08 34 73 Sound Control Door Assemblies. **Specifier Note: Delete if not relevant to Project scope.**

Individualized specification for this product is on www.megametusa.com under Sound Door.

08 39 00 Pressure-Resistant Doors. **Specifier Note: Delete if not relevant to Project scope.**

Individualized specification for this product is on www.megametusa.com under Pressure Door and/or Wind Door.

08 70 00 Hardware.

08 80 00 Glazing.

09 00 00 Finishes.

09 20 00 Plaster and Gypsum Board.

09 90 00 Painting and Coating.

This specification covers only those products listed in Section 1.1. Not included in this Section 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.

1.3 REFERENCES

The publications listed in this section form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only. When a more recent standard is available, the specifier should verify its applicability prior to inclusion.

MegaMet Industries, Inc., 3228 6th Avenue North, Birmingham, AL

PO Box 635, Birmingham, AL 35201

205-322-7700 – Fax 205-322-4600 – www.megametUSA.com



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ASTM A 568/A 568M Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.

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

ASTM A 924/A 924M Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process.

ASTM A 1008/A 1008M Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

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.

ASTM C 143/A 143M Test Method for Slump of Hydraulic-Cement Concrete.

ANSI/SDI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

ANSI/SDI A250.11 Recommended Erection Instructions for Steel Frames.

NAAMM HMMA 803, Steel Tables.

HMMA 820-TN01 Grouting Hollow Metal Frames.

NAAMM HMMA 820 TN02-03, Continuously Welded.

NAAMM HMMA 831, Recommended Hardware Locations for Hollow Metal Doors and Frames.

HMMA 840 Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames.

HMMA 840-TN01 Painting Hollow Metal Products.

HMMA 841 Tolerances and Clearances for Commercial Hollow Metal Doors and Frames.

HMMA 861 Guide Specifications for Commercial Hollow Metal Doors and Frames.

Specifier Note: The fire test chamber defined by ANSI/UL or ANSI/NFPA documents is a single, flat plane not intended for testing of non-linear frames. Add the following Reference Documents ONLY if the frames in this Section need to be fabricated essentially similar to fire protection rated frames. Select only those relevant to this specific project and delete others.

ANSI/NFPA 252 Standard Methods of Fire Tests of Door Assemblies.

ANSI/NFPA 257 Standard on Fire Test for Window and Glass Block Assemblies.

ANSI/UL 9 Fire Tests of Window Assemblies.

ANSI/UL 10B, Fire Tests of Door Assemblies.

ANSI/UL 10C Positive Pressure Fire Tests of Door Assemblies.

NFPA 80 -1999 Standard for Fire Doors and Fire Windows.

NFPA 80 -2007 Standard for Fire Doors and Other Opening Protectives.

1.4 TESTING and PERFORMANCE REQUIREMENTS

Frames intended to contain doors shall be reinforced and fabricated similar to units structurally tested to surpass 1-million cycles when tested in accordance with ANSI A250.4.

Frames shall incorporate recycled materials in at least 30% by weight.

Prime Paint shall meet the Acceptance Criteria described in ANSI A250.10.

Specifier Note: Delete the following paragraph if not relevant to Project scope.

Where noted on the door schedule, frames and windows shall be fabricated and reinforced essentially similar to those tested or otherwise evaluated by Underwriters Laboratories, Inc for the fire protection rating noted. Material shall be under a factory Follow-Up services Program of Underwriters Laboratories, Inc. If any door or frame product specified by the Architect to be fire-rated cannot qualify for labeling because of size, design, hardware or any other reason, the Architect shall be so advised in the submittal documents. If hardware, glazing, or other options affecting the fire-rating and are unknown at the time of submittal document preparation, the architect shall be advised prior to fabrication.



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1.5 SUBMITTALS

Submit shop drawings showing profiles, product components, anchors, and accessories. Details deemed to be proprietary by the manufacturer may be identified as such.

If requested prior to bid date, submit samples as follows:

- Frame: 1 ft. x 1 ft. section showing assembled corner joint at head and jamb. Include hinge reinforcement [and grout guard] in one rabbet.
- Segmented Frame: 1 ft. long section of vertical mullion for profile purposes. Faces of sample are permitted to be other than representative of final production dimensions.
- Radiused, (or other non-linear) Frame: 1 ft. long section of frame head or horizontal bar for profile construction purposes. Faces of sample are permitted to be other than representative of final production dimensions.

All samples submitted shall be of the production type and shall represent in all respects the minimum quality of work to be furnished by the manufacturer. No work represented by the samples shall be fabricated until the samples are approved and any degradation of fabrication quality compared to the approved samples is cause for rejection of the work.

Submit installation instructions and installation tolerances if other than as specified in ANSI/SDI A250.11 or HMMA 840.

Submit jobsite storage and protection requirements if other than as specified herein or in ANSI/SDI A250.8, HMMA 861, HMMA 867 or HMMA 840-TN01.

1.6 QUALITY ASSURANCE

Manufacturer shall provide evidence of having personnel and plant equipment capable of fabricating hollow metal frame product of the types specified.

Installer shall have documented experience in installation of commercial frame assemblies.

Fabricate products to tolerances in compliance with HMMA-841.

1.7 DELIVERY, STORAGE, AND HANDLING

Store and handle products in accordance with ANSI A250.8, HMMA 861, HMMA 867, or HMMA 840-TN01 in manufacturer's original, unopened, undamaged containers.

Protect materials from adverse temperature and humidity conditions.

Store doors and frames upright on wood planking, protected at corners to prevent damage.

Store accessories in a secure area protected from adverse temperature and humidity conditions.

Do not store in non-vented plastic or canvas shelters.

1.8 COORDINATION

The contractor responsible for coordination and installation of products covered by this Section shall:

- Verify and provide to the manufacturer, actual opening sizes and site conditions by field measurements before fabrication. Submittal drawings shall reflect measurements and conditions provided, and product manufactured accordingly. Coordinate field measurements with fabrication and construction schedules to avoid delay.
- Where radiused, segmented, or other non-linear frames are shown, verify that floor plan and elevation layouts are in accordance with architectural documents before fabrication. Indicate any deviations on submittal drawings and coordinate field measurements with fabrication and construction schedules to avoid delay.
- 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.

Manufacturer shall not proceed with fabrication without receipt of approved submittal drawings and approved hardware schedules. The approved submittal drawings and the approved hardware schedules are the versions that have been provided to the hollow metal manufacturer at time of release for fabrication



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The contractor responsible for the coordination of procuring products provided under this Section and Section 1.2 shall comply with the hollow metal manufacturer's ordering instructions and lead time requirements to avoid delays.

PART 2 - PRODUCTS

Specifier note: MegaMet Industries utilizes the historic gage definitions for steel thickness due to internal systems and processes. Where gages are noted, they shall be based on minimum thickness defined by NAAMM HMMA 803, Steel Tables.

2.1 MANUFACTURER

Non-Linear Frames shall be manufactured by:
MEGAMET INDUSTRIES, INC.

P.O. BOX 635 (3228 6th. Avenue North) BIRMINGHAM, ALABAMA 35201

WEBSITE: www.megametusa.com

PHONE: (205) 322-7700 TOLL FREE: (888) 322-7750

FAX: (205) 322-4600

Substitutions: Permitted in accordance with Architect's previously approved suppliers of materials similar to those specified herein.

2.2 HOLLOW METAL FRAMES

Hollow metal frames for "**Specifier select**" (interior) (exterior) (all) shall be MegaMet M series. Cold and hot rolled steel for "**Specifier select**" (interior) (exterior) (all) frames shall comply with ASTM A 568, ASTM A 1008 and/or ASTM A 1011.

Cold and hot rolled steel for reinforcing shall comply with ASTM A 568, ASTM A 1008 and/or ASTM A 1011.

Specifier: add or delete following two sentences:

Hot-dip galvanized steel for "**Specifier select**" (interior) (exterior) (all) frames where indicated on the door schedule, shall comply with ASTM A 653 and ASTM A 924.

Coating thickness shall be Class "**Specifier select**" (A25) (A40) (A60). **Specifier note: Coating thickness of G60 or G90 is available but not recommended except for use in extreme exposure conditions due to potential paint adhesion issues.**

Fabricate "**Specifier select**" (interior) (exterior) (all) frames from "**Specifier select**" (16) (14) (12) gage material.

Specifier: add the following sentence only if applicable to project:

Fabricate non-radiused door openings of "**Specifier select**" (interior) (exterior) (all) 16 or 14 gage frames with an integral 0.115" wide X 3/8" deep kerf to accept gaskets provided by Section 08 70 00.

Frames shall have integral stops 5/8" high unless shown otherwise, and be neat in appearance, square, and free of defects, warps and buckles. Frame members shall be of uniform profile throughout their lengths. Corner joints (where 90-degrees) shall have all contact edges closed tight with faces mitered and stops either butted or mitered.

Corner joints (where 90 degrees) detailed with unequal faces shall be mitered at the required degree. The use of fillers to close off mitered joints at unequal head/jamb intersections shall not be permitted.

Hardware Preparation: Mortise, reinforce, drill, and tap to receive templated mortise hardware; reinforce for specified surface hardware in accordance with HMMA 861. Grout guards shall be provided at hardware mortises on frame product to be grouted.

Hinge reinforcement shall be 7 gage plates formed to suit the hinge thickness. The use of clips, projections, screws, or other means of accommodating hinge depth shall not be permitted. The use of "double drilled" hole patterns shall not be permitted.

Provide wall and floor anchors suitable to the substrate, located in accordance with HMMA 861.



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Specifier: add the following paragraph only if applicable to project:

Cut-off stops, where specified at door openings, shall be capped at heights as shown on the approved submittal drawings, and jamb joints below cut-off stops shall be welded, filled and ground smooth so that there are no visible seams. It is recommended that cut off stops not be used at exterior, lead lined, double egress or gasketed openings.

2.3 FRAME ASSEMBLY; RADIUSED NON-LINEAR FRAMES

Perimeter face joints of frames for "**Specifier select**" (interior) (exterior) (all) locations shall be shipped "**Specifier select**" (face welded) (continuously full profile welded). Refer to NAAMM HMMA 820 TN02-03 for information on welding of frame components.

All perimeter face joints at welded frames shall be ground and finished smooth.

Radiused members or components shall be formed without slits or notches visible in finished product.

All welded frames shall be provided with a temporary steel spreader welded to the bottom of jambs or mullions to serve as bracing during shipping and handling. Spreader shall not be used for installation.

Butt joints at mullions or bars shall be face welded and finished smooth.

When shipping or jobsite limitations so dictate, or when advised by the contractor responsible for coordination or installation, frame product for large openings shall be fabricated in sections for field assembly by others. Plates or angles shall be installed at each splice joint.

All frames or components shall be marked for corresponding opening number or location.

2.4 FRAME CONSTRUCTION; SEGMENTED FRAMES

Where detailed on architectural drawings, sidelight/transom frames or borrowed lights detailed as non-linear in plan view (in same plane) shall be fabricated as segmented units for use with straight (not curved) glazing or panels. Such frames shall be fabricated as described in 2.2 and 2.3 with the following added requirements:

- Vertical frame members shall run full height with horizontal members notched and tightly butted to verticals.
- Vertical members shall have unequal faces which shall be formed to match the non-linear plan view of the completed assembly. Profiles of vertical members shall be clearly detailed on submittal drawings.
- Vertical members shall have angle or channel shaped anchors for fastening to the floor.
- All face joints at vertical/horizontal intersections shall be continuously welded on the outside of the faces. Welds shall be factory ground and finished smooth.
- Where necessary for shipping, handling, or access purposes frames shall be equipped with angles or channels for splicing in the field during erection. Such field splices shall be clearly detailed on submittal drawings and shall be verified by the Contractor prior to fabrication. Such splice joints shall be welded and finished by Contractor to match factory joints.

2.5 COORDINATION OF DIMENSIONS

Specifier: select from the following two sentences and delete the other:

Frames are to be fabricated to dimensions indicated on architectural plans after plan layouts have been confirmed by the Contractor.

Frames are to be fabricated from field dimensioned plan layouts created by the Contractor.

2.6 PROVISIONS FOR GLAZING OR INFILL PANELS IN FRAMES

Where shown, frames shall be provided with removable channel or angle shaped stops with butted corners to secure glazing or in-fill panels. Stops shall be secured to frame sections with # 6 minimum, corrosion resistant sheet metal screws. Screw holes in channel stops shall be dimpled or countersunk for minimal projection above surface.

Glazing materials shall be furnished and installed in the field by others, in accordance with glazing sizes and thickness shown in the contract documents.



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Specifier: insert the following paragraph only if in-fill panels occur in frames:

In-fill panels shall be constructed from 18 gage sheet steel to match frame material. Backing (core) shall be manufacturer's standard or solid fire-rated material for fire-rated frames.

2.7 MANUFACTURING TOLERANCES

The manufacturer of hollow metal frame product is responsible only for the tolerances directly related to manufacturing of the product. The final clearances and relationships between door and frame depend on the setting of the frame, and the hanging and adjustment of the door and hardware. Manufacturing tolerances shall be maintained within the limits established by HMMA 841 and HMMA-861.

2.8 HARDWARE LOCATIONS

The location of hardware on doors and frames shall be as established in HMMA-831 and HMMA-861. When hollow metal frame products are specified for use with doors to be furnished by others, hardware locations on the doors shall be governed by the location on the frames.

2.9 FACTORY PRIME FINISH

After fabrication, all tool marks and surface imperfections shall be filled and sanded as required to make face sheets, vertical edges and weld joints free from irregularities. Welded joints shall be filled and dressed smooth except where otherwise specified.

After appropriate metal preparation, exposed surfaces of frames shall receive a factory applied rust inhibitive primer which meets or exceeds the performance requirements of ANSI/SDI A250.10. Primer must be fully cured prior to shipment.

All touch-up primer shall be formulated for Direct to Metal (DTM) application.

PART 3 - EXECUTION

3.1 SITE STORAGE AND PROTECTION OF MATERIALS

Specifier note: Correct site storage and protection are essential to proper performance of all hollow metal products. It is important to recognize that these are not the responsibility of the hollow metal manufacturer. For this reason the requirements for storage and protection of hollow metal products should be included in the Section of the specification where installation work is specified.

The contractor responsible for receiving, storing and handling of hollow metal products shall be familiar with and store materials in accordance with ANSI A250.8, HMMA 861, or HMMA 840-TN01.

Requirements are summarized below, but are not intended to replace the above noted documents:

- The contractor responsible for receiving hollow metal products shall remove wraps or covers upon delivery at the building site and shall 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.
- The contractor responsible for receiving hollow metal products shall ensure that materials are properly stored on planks or dunnage in a dry location. Store frames in this Section in a vertical position, spaced by blocking.
- Materials shall be covered for protection against damage in a manner permitting air circulation.

3.2 INSTALLATION

Specifier note: Correct installation is essential to the proper performance of doors and frames. It is important to recognize that installation is not the responsibility of the hollow metal manufacturer. For this reason the requirements for installation should be included in the Section of the specifications where installation work is specified. It shall be the responsibility of the general contractor, using experienced personnel, to perform the work outlined below.



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For additional information regarding installation see NAAMM HMMA 840, “Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames”.

Prior to installation the installer shall perform the following:

- The area of floor on which the frame product is to be installed, and within the path of the door swing, shall be checked for flatness.
- Remove temporary spreaders from welded frames.
- Check frames in this Section for correct size, swing, fire rating and opening number.
- Interior surfaces of perimeter frame product sections to be installed in masonry or concrete walls shall be isolated and protected from grout and antifreeze agents.

Specifier note: The use of water based masonry grouts, with or without antifreeze agents, should be carefully weighed during the detailing and specification process. Grouting of mullions and other closed sections is not recommended, and plaster based grouts should not be used. Grout guards are intended to protect hardware mortises and tapped holes from masonry grout of 4 in. maximum slump consistency, hand troweled in place. If a lighter consistency grout (greater than 4 in. 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 hardware mortises & tapped holes and prevent leakage around frames.

Frames are not intended or designed to act as forms for grout or concrete. Grouting of hollow metal sections shall be done in “lifts” or precautions shall be taken by the contractor to ensure that frames are not deformed or damaged by the hydraulic forces that occur during this process. Refer to NAAMM HMMA Tech Note, HMMA 820 TN01-03.

During the frame erection process, the installer shall:

- Check and correct as necessary for opening width, opening height, squareness, alignment, twist and plumbness.
- Assure that temporary spreaders have been removed.
- Maintain Installation tolerances within the limits of HMMA-840 and ANSI A250.11.
- Keep hollow metal surfaces free of grout, tar and/or other bonding materials or sealers. Grout, tar, and/or bonding materials or sealers shall be promptly cleaned off frame product.
- Finish and touch-up marks caused by spreader removal.
- Repair hollow metal surfaces which have been scratched or otherwise marred during installation, cleaning, and/or field welding. Promptly finish smooth, clean, treat for maximum paint adhesion and touch up with a rust inhibitive primer comparable to and compatible with the shop applied primer and finish paint specified in Section 09 90 00 [09900]. All touch-up primer and finish paint must be formulated for Direct to Metal (DTM) application.

During door and hardware installation, the installer shall:

- Install labeled fire doors and frames in accordance with the terms of their listings, ANSI/NFPA 80, or the local Authority Having Jurisdiction.
- Maintain proper door edge clearances to assure proper operation. Where necessary, metal hinge shims, furnished by installer, are permitted to maintain clearances.
- Install hardware in accordance with hardware manufacturer’s templates and instructions.

After hardware installation:

- Finish paint in accordance with Section 09 90 00.
- Install door silencers.
- Install glazing materials in accordance with Section 08 80 00.
- Inspect to confirm proper operation (opening, closing, and latching) of doors and frames.

END OF SECTION