HMMA Hollow Metal Manual

Al Urbaniak
Welcome!

- 3 DHI CEP pts. available for each 1 hr. webinar.
- A recording of today’s webinar will be available on DHIInteractive for members
  - Handouts and additional information available
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  - Click on **Membership** on top left
  - Click on **Members Only**
- 1 hr. presentation, Q & A at the end
  - Submit questions via Chat/Question box
- All attendees muted
Course Description

Overview of HMMA’s Hollow Metal Manual

• **Review Product standards**
  – Terminology
  – Manufacture process
  – Application
  – Components, and more

• **Selecting the correct products**

• **Specifying Hollow Metal doors and frames**
• HMMA Product Standards

• ANSI/HMMA Guide Specifications

• Technical Tips
Welcome to HMMA, a Division of NAAMM

Mission Statement
The Hollow Metal Manufacturers Association (HMMA) promotes the advantages of hollow metal products. HMMA is a leader in:

- Developing performance standards and specifications
- Creating and testing products
- Providing progressive solutions

Established in 1969, HMMA is a voluntary, non-profit business association composed of more than 50 member companies throughout North America. HMMA is the largest of the six divisions of the Chicago-based National Association of Architectural Metal Manufacturers (NAAMM), an organization established in 1938, with roots reaching back to 1907.

Known throughout the construction industry for their strength, durability, design flexibility and suitability in demanding settings, hollow metal steel doors and frames remain the logical choice for discerning architects, engineers and specifiers who demand high quality and cost-effective solutions.
Technical Information – No Charge

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Provides a high level overview of Custom Hollow Metal:

1. Benefits and functionality
2. Aesthetic opportunities
3. Industry History
Hollow Metal History

INTRODUCTION TO CUSTOM HOLLOW METAL

The term "custom metal" refers to many of these components of building construction that are made of cost-controlled sheet metal. It applies to a wide range of products, including doors, frames, and hardware, such as locks, hinges, and latches. When these products are designed and manufactured, they are often referred to as "custom." This term is used to describe products that are made to order, according to the specifications of the customer.

Why CUSTOM Hollow Metal?

In some cases, custom metal is applied to hollow metal doors and frames. Custom metal products are designed specifically for a particular application, taking into account factors such as the building's requirements, the architectural style, and the budget. These products are typically more expensive than standard metal products, but they offer a higher level of customization and durability.

$\text{HOLLOW METAL HISTORY}$
HMMA 800: *Introduction to Custom Hollow Metal*

- Hollow Metal History
- Window wall details
HMMA 800: Introduction to Custom Hollow Metal

- Hollow Metal History
- Window wall details
- Wall and floor details
Provides descriptions of terms used in the Hollow Metal Industry:

1. Door terminology
2. Frame terminology
3. Component part terminology
4. Hardware preparation terminology
Glossary of Terms

For Hollow Metal Doors and Frames

Definitions of terms commonly used in connection with Hollow Metal Work, defined as they apply specifically to hollow metal, may be defined differently by other industries.

ACTIVATED DOOR (ACTIVE LEAF): In a pair of doors, the door or doors through which the locking device is installed.

ACTUAL DOOR SIZE: The largest measured width by height of the doorleaf as manufactured. Equal to the nominal door size minus design clearance. Also referred to as Net Door Size.

ADJUSTABLE BASE ANCHOR: See ADJUSTABLE FLOOR ANCHOR.

ADJUSTABLE FLOOR ANCHOR: A frame with a flange in two or more places to accommodate various wall thicknesses. Also referred to as an expandable frame or split frame.

ANCHOR: A metal device provided inside of a panel, head, sill or mullion used to secure the frame to the adjacent structure, such as wall, ceiling or floor. Also referred to as an anchor, wall anchor, floor anchor, etc. See listing.

ADJUSTABLE FLOOR: A metal device used to secure a frame to floor at base which allows the panel to be positioned at a location below the floor. Typically used in a depressed rib or milled floor condition. Also referred to as an Adjustable Base Anchor.

COMPRESSION: An adjustable metal device, used to secure, adjust and square a slip on frame.

EXISTING WALL: A hole preparation, generally in the sills of a frame member, with internal reinforcing/molding guide for an expansion bell, mastic bell, or screw. Used to secure the frame to an existing opening.

FIXED FLOOR: A metal device attached to the bottom of the frame to secure a frame to the floor. Also referred to as a Base Anchor or Sill Anchor.

MASONRY STEEL: A solid metal device used to secure the frame to new masonry walls.

MASONRY "T"-SHAPED: A hollow metal device used to secure the frame to new masonry walls.

MASONRY WIRE: A hollow metal device used to secure the frame to new masonry walls.

MULLION: A metal strip or angle in either 1 or 2 pieces, secured to the floor in which mullions are then positioned over.

PIEVED-IN-PLACE: A metal device used to secure a frame to new concrete poured in place wall.

SILL: A wooden member secured to the floor in which the sill section of a hollow metal frame is positioned over.

STEEL STUB: A metal device secured in a frame for additional attachment to a wall built with metal studs.

Components
Components

Hardware preps

HMMA 801: Glossary of Terms

GLOSSARY OF TERMS
For Hollow Metal Doors and Frames

BACKEND: The element of the frame profile which extends from the rearward and is formed parallel to the wall, inside-the-frame. Also referred to as an acorn, conical or drywall corner. See FRAME ELEMENTS for additional details.

BACKSET: The distance from the center or datum line for hardware preparation for a formed door or frame.

BOLTS: The distance from the center of the bolt to the edge of the hinge or bolt. Shown on beveled edge door.

HINGE: On a door, the distance from the push side face sheet to the edge of the hinge socket.

LOK: The distance from the center of the lock edge of a door to the centerline of the lock face plate. Shown on beveled edge door.

STRIKE: On a frame rebate, the distance from the stop to the edge of the strike plate.

BASE: See BELL

BASE ANCHOR: See ANCHOR

BASE ANCHOR EXTENSION: See FLOOR ANCHOR EXTENSION

BASE FLOOR: Below the top of the concrete or structural slab. See also Jack Extension.

BEVELED EDGE: See EDGE, BEVELED.

CLEARANCE: A term used to define a distance between two frames.

DOOR EDGE: The distance between the edge of the door and frame mating, or the edge of two doors of a pair.

FRAME INSTALLATION, BUTTING WALL: The distance between frame and wall intersection where the frames butt against the wall.

FRAME INSTALLATION, OVERLAPPING WALL: The distance between frame members or channels to accommodate interstices in the mating to the wall, when the frame is overlapping the wall.

STOP: The distance between the frame stop and the face of the door when the door is in the closed position. Typically equal to the thickness of the trimmer.

CLOSED SECTION: A frame member without a throat spacing such as a mullion or transom bar.

CLOSER REINFORCEMENT: A metal plate or channel in a door or frame to provide additional strength for the attachment of a door closer, fixed and located to accommodate hardware requirements.
HMMA 801: Glossary of Terms

- **Components**
- **Hardware preps**
- **Construction options**
Provides a high level overview of main processes used in the production of Hollow Metal:

1. Types of steel used

2. Manufacturing processes
   - Shearing
   - Punching
   - Welding
   - finishing
HMMA 802: Hollow Metal Manufacturing

- Types of steel currently used
  - Hot-rolled steel
  - Cold-rolled steel
  - Zinc-coated steel
  - Stainless steel
  - Applications
HMMA 802: *Hollow Metal Manufacturing*

- Types of steel currently used
- Fabrication processes
HMMA 802: *Hollow Metal Manufacturing*

- Types of steel currently used
- Fabrication processes
  - SHEARING
HMMA 802: Hollow Metal Manufacturing

- Types of steel currently used
- Fabrication processes
  - SHEARING
  - BLANKING, PUNCHING
HMMA 802: Hollow Metal Manufacturing

- Types of steel currently used
- Fabrication processes
  - SHEARING
  - BLANKING, PUNCHING
  - FORMING OR BENDING
HMMA 802: *Hollow Metal Manufacturing*

- Types of steel currently used
- Fabrication processes
  - SHEARING
  - BLANKING, PUNCHING
  - FORMING OR BENDING
  - WELDING
HMMA 802: *Hollow Metal Manufacturing*

- Types of steel currently used
- Fabrication processes
  - SHEARING
  - BLANKING, PUNCHING
  - FORMING OR BENDING
  - WELDING
  - FINISHING
Provides a comparison of steel thicknesses used in hollow metal products:

1. Inch thickness
2. Metric thickness
3. Gage equivalents
The term “Gage” no longer used.

HMMA 803: **Steel Tables**
HMMA 805: Selection and Usage Guide

Provides guidance in selecting the correct door and frame to meet the project and jobsite requirements:

- Performance and usage
- IBC occupancy groups
- Opening applications
- Product selection
- Product specification
## Performance Levels

### HMMA 805: Selection and Usage Guide

#### Selection and Usage Guide for Hollow Metal Doors and Frames

Performance Levels: Selection of the correct hollow metal product is based on performance expectations including projected usage, impact, probability, abuse and maintenance. The architect and/or specification writer must take into consideration when specifying the correct door, frame and hardware to meet the performance requirements.

The following are HMMA guidelines to help the architect and specification writer in the selection of Hollow Metal products:

<table>
<thead>
<tr>
<th>Performance Levels</th>
<th>Duty</th>
<th>Minimum Thickness (min. in.)</th>
<th>Application &amp; Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Light Duty</td>
<td>Frame: 16 ga. 0.042” (1.06)</td>
<td>Building areas exposed to low frequency of usage and low probability of impact and abuse (i.e. closets, offices).</td>
<td></td>
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<tr>
<td></td>
<td>Door: 20 ga. 0.032” (0.81)</td>
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<td></td>
</tr>
<tr>
<td>2 Moderate Duty</td>
<td>Frame: 16 ga. 0.063” (1.6)</td>
<td>Building areas exposed to moderate frequency of usage and moderate probability of impact and abuse (i.e. stairwells, class rooms, meeting rooms).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Door: 18 ga. 0.042” (1.06)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Heavy Duty</td>
<td>Frame: 16 ga. 0.059” (1.54)</td>
<td>Building areas exposed to high frequency of usage and high probability of impact and abuse (i.e. exerior and service entrances, recreational areas, health care).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Door: 16 ga. 0.039” (0.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Maximum Duty</td>
<td>Frame: 16 ga. 0.087” (2.21)</td>
<td>Building areas exposed to high frequency of usage and very high probability of impact and abuse (i.e. exterior and service entrances, recreational areas, psychiatric clinics, pharmaceutical).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Door: 14 ga. 0.058” (1.46)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Detention Security</td>
<td>Frame: 14 ga. 0.087” (2.21)</td>
<td>Building areas required to contain the movement of individuals to designated areas (i.e. cells, control and day rooms in detention and correctional facilities).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Door: 14 ga. 0.058” (1.46)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Commercial Security</td>
<td>Frame: 16 ga. 0.087” (2.21)</td>
<td>Building areas exposed to elevated threat of intrusion, forced entry or ballistic attack (i.e. infrastructure and government facilities).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Door: 14 ga. 0.058” (1.46)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**
1. Various factors may affect the material thickness of the door and frame including but not limited to the following:
   a. Opening configuration: width, height, glass lights and/or louvered.
   b. Application: sound control, radiation shielding, fire, windstain, thermal, blast or ballistic resistance, detention or commercial security.
2. Certain applications may require consideration of alternate material options including:
   a. Zinc coated steel exterior, interior masonry or interior openings subject to corrosive conditions.
   b. Stainless steel: severely corrosive environments, clean rooms and aesthetic considerations.
3. Steel Thickness: This document has been prepared as an aid to Architects and Specifiers Writers. For the purpose of maintaining consistency in terminology, the term “gage” has been used to describe the steel thickness of components and reinforcements. Prior to 1970, sheet steel was referred to by gage. ASTM and ANSI currently do not list gage numbers in their standards. Like many general terms, gage (or gauges) is ingrained in many vocabularies and is misunderstood as a term for thickness. All dimensions shown in parenthesis are metric equivalents (millimeters) and do not include the common descriptive abbreviation of (mm). Refer to NAAMM/HMMA 805 and page 30 of this document for decimal equivalent dimensions.
HMMA 805: Selection and Usage Guide

- Performance Levels
- Frequency of use and abuse

SELECT and USAGE GUIDE for HOLLOW METAL DOORS and FRAMES

FREQUENCY OF USE:
Frequency of use relates to the relationship of how many times the opening is expected to be cycled (opened and closed). Cycles per hour will vary greatly depending on the type of building and the occupancy rate. Estimated cycles per NWY are based on an 8 hour day, 5 days a week, 12 weeks per year. A guideline for evaluating the use is shown below:

<table>
<thead>
<tr>
<th>Frequency of Use</th>
<th>ANSI A250.4 Minimum cycles</th>
<th>Estimated cycles/hr. based on life cycle years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250,000 cycles (Level C)</td>
<td>24, 12, 6, 6, 5, 5, 4</td>
</tr>
<tr>
<td>Moderate Usage</td>
<td>500,000 cycles (Level B)</td>
<td>40, 24, 16, 12, 10, 10, 6</td>
</tr>
<tr>
<td>High Usage</td>
<td>1,000,000 cycles (Level A)</td>
<td>96, 48, 32, 24, 19, 19, 16</td>
</tr>
</tbody>
</table>

NORMAL USE AND OPERATIONS:
ANSI A250.4 is the industry standard performance test for evaluating commercial, industrial and institutional hollow metal doors. The test is performed under laboratory conditions. It includes an operate door, frame and hardware with prescribed mechanical opening and closing of the door and periodic twisting. For the purpose of this standard, normal door, frames and hardware used as an assembly with ANSI A250.4.

Improper installation, inadequate maintenance or improper hardware adjustment will add significantly to the abuse factors and reduce long term functionality of all openings.

ABUSE PROBABILITY:
Abuse probability relates to the projected levels of physical contact or contact by foreign objects. A guideline for evaluating abuse probability is as follows:

<table>
<thead>
<tr>
<th>Abuse Probability</th>
<th>Abuse Description</th>
<th>Opening Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Periodic bumping</td>
<td>Offices, dressing rooms, private bathrooms, closets (mechanical, plumbing, electrical)</td>
</tr>
<tr>
<td></td>
<td>with elbows, knees or shoulder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Typical manual opening and closing of the door</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cleaning equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foreign objects holding door open</td>
<td></td>
</tr>
</tbody>
</table>
| Moderate          | Aggressive opening and closing | Statues,
|                   | Propping automatic doors open | Cemetery gates, public bathrooms, emergency exit doors, janitor closets |
|                   | Excessive slamming |                  |
|                   | Wheel chairs |                  |
|                   | Maintenance carts |                  |
| High              | Potential forced entry | Main entrances, classroom entrances, high volume public access, kitchens |
|                   | Automatic door operators |                  |
|                   | Access control |                  |
|                   | High wind and weather exposure |                  |
|                   | Quarries, material handling equipment |                  |
|                   | Opening doors with body parts other than hands |                  |
|                   | Bodily impact |                  |
|                   | Hanging on doors |                  |
| Very High         | High potential forced entry | Exterior and service entrances to retail, financial institutions, government facilities, infrastructure access |
HMMA 805: *Selection and Usage Guide*

- Performance Levels
- Frequency of use and abuse
- IBC Occupancy Groups
HMMA 805: Selection and Use

- Performance Levels
- Frequency of use and abuse
- IBC Occupancy Groups
- Selection and Specification
Provides an overview of various door constructions and options:

1. Doors types
2. Construction and specs
3. Clearances
4. Handing
5. Door designs and core options
HMMA 810: *Hollow Metal Doors*

Four basic types in commercial construction:

- swinging
- sliding
- rolling steel
- revolving
HMMA 810: Hollow Metal Doors

Basic construction types

ANSI/HMMA specifications (CSI format)
HMMA 810: *Hollow Metal Doors*

- **Basic construction types**
  - ANSI/HMMA specifications (CSI format)

- **Clearances and Handing**
  - Single swing
  - Double swing
  - Double Egress
HMMA 810: *Hollow Metal Doors*

- Basic construction types
  - ANSI/HMMA specifications (CSI format)
- Clearances and Handing
  - Single swing
  - Double swing
  - Double Egress
- Door designs and Core constructions
  - Steel stiffened
  - Honeycomb
  - Foam
Provides an overview of various frame constructions and options:

1. Elevation types
2. Profile variations
3. Anchors
4. Miters and connections
HMMA 820: *Hollow Metal Frames*

- Single swing
- Pairs
- Transom frames
HMMA 820: Hollow Metal Frames

- Frame elevations
  - Single swing
  - Pairs
  - Transom frames

- Profiles and anchors
  - Single & double rabbet
  - Anchor & wall applications
HMMA 820: Hollow Metal Frames

- Frame elevations
  - Single swing
  - Pairs
  - Transom frames

- Profiles and anchors
  - Single & double rabbet
  - Anchor & wall applications

- Miters and connections
  - Knock down and welded
  - Sills
  - Splice joints
Provides an overview of preparations options for Builders Hardware devices:

1. Hanging – hinge options
2. Securing – lock options
3. Controlling:
   • closer, holder, opener
4. Protecting
Hanging devices

HMMA 830: Hardware Selections
HMMA 830: Hardware Selections

- Hanging devices
- Locks, Latches and Deadlocks
HMMA 830: Hardware Selections

- Hanging devices
- Locks, Latches and Deadlocks
- Panic / Fire Exit Hardware
HMMA 830: **Hardware Selections**

- Hanging devices
- Locks, Latches and Deadlocks
- Panic / Fire Exit Hardware
- Closing & Controlling devices
An overview of most commonly used hardware locations:

- Hinges
- Lock, latches, deadbolts
- Panic exit devices
HMMA 831: Hardware Locations
Provide the guidelines for the proper installation and storage of hollow metal doors and frames:

1. Fabrication and shop drawings
2. Jobsite storage and handling
3. Installation:
   • Brace, plumb, level
   • Anchor
4. Jobsite care
ANSI/HMMA 840: Installation & Storage

Storage and Handling

Proper storage, handling and installation assures long term opening operation.
ANSI/HMMA 840: Installation & Storage

- Storage and Handling
- Spreader and Bracing
ANSI/HMMA 840: *Installation & Storage*

- Storage and Handling
- Spreaders and Bracing
- Frames for Masonry Walls
ANSI/HMMA 840: *Installation & Storage*

- Storage and Handling
- Spreaders and Bracing
- Frames for Masonry Walls
- Frames for Stud Walls
ANSI/HMMA 840: *Installation & Storage*

- Storage and Handling
- Spreaders and Bracing
- Frames for Masonry Walls
- Frames for Stud Walls
- Plumb and Square
HMMA 841: *Tolerances & Clearances*

Illustrated the tolerance requirements used by HMMA Members for both manufacturing and installation:

- Dimensions
- Locations
- Forming
- Contours
- Flatness
- Installation
HMMA 841: *Tolerances & Clearances*

✅ Hardware Location
HMMA 841: Tolerances & Clearances

- Hardware Location
- Frame Profile
HMMA 841: Tolerances & Clearances

- Hardware Location
- Frame Profile
- Door Panel
HMMA 841: Tolerances & Clearances

- Hardware Location
- Frame Profile
- Door Panel
- Installation
HMMA 850: *Fire-Rated Doors & Frames*

An overview of the testing and listings of Fire Rated hollow metal products:

1. Testing, listings and approvals
2. Hardware application guidelines
3. Frame approval guidelines
4. Door approval guidelines
HMMA 850: *Fire-Rated Doors & Frames*

- Crucial in providing the fire/life safety protection
- In order to make the proper selection, it is essential that specifiers have adequate information on the different fire door and frame assemblies available.
HMMA 850: **Fire-Rated Doors & Frames**

- **Testing and approval**
HMMA 850: Fire-Rated Doors & Frames

✓ Testing and approval

✓ Basic elevations
HMMA 850: Fire-Rated Doors & Frames

- Testing and approval
- Basic elevations
- Hardware applications
HMMA 850: Fire-Rated Doors & Frames

- Testing and approval
- Basic elevations
- Hardware applications

- Door elevations
HMMA 850: Fire-Rated Doors & Frames

- Testing and approval
- Basic elevations
- Hardware applications
- Door elevations
- Frame elevations
CSI Format

- PDF
- MS Word

1. Intended to be used as the basis for developing job specifications
2. Must be edited to fit specific job requirements.
ANSI/HMMA Guide Specifications

- Light Commercial
- Commercial Welded Core
- Commercial Security
- Detention Security
- Acoustical Assemblies
- Commercial Stainless Steel
- Commercial Laminated Core

HMMA 860
HMMA 861
HMMA 862
HMMA 863
HMMA 865
HMMA 866
HMMA 867
1. Application – Light commercial

2. Door construction:
   - Steel:
     - Cold rolled or galvannealed
   - Steel thickness:
     - Interior: 0.032” (0.81mm) (20 gage)
     - Exterior: 0.042” (1.06mm) (18 gage)
   - Core – steel stiffened welded to face
   - Edge – visible or welded

3. Frame construction:
   - Steel thickness:
     - interior or exterior
     - 0.053“ (1.34mm) (16 gage)
   - Miters: KD or welded
ANSI/HMMA 861: Commercial - Welded Core

1. **Application** – Commercial

2. **Door construction:**
   - **Steel:**
     - Cold rolled or galvannealed
   - **Steel thickness:**
     - Interior: 0.042” (1.06mm) (18 gage)
     - Exterior: 0.053” (1.34mm) (16 gage)
   - **Core** – steel stiffened welded to face
   - **Edge** – welded

3. **Frame construction:**
   - **Steel thickness:**
     - interior or exterior
     - 0.053“(1.34mm) (16 gage) or 0.067” (1.70mm) (14 gage)
   - **Miters:** welded
1. **Application** – Commercial

2. **Door construction:**
   - **Steel:**
     - Cold rolled or galvannealed
   - **Steel thickness:**
     - Interior: 0.032” (0.81mm) (20 gage)
     - Exterior: 0.042” (1.06mm) (18 gage)
   - **Core:** Laminated options
   - **Edge:** visible seam or welded

3. **Frame construction:**
   - **Steel thickness:**
     - interior or exterior
     - 0.053“(1.34mm) (16 gage)
   - **Miter:** KD or welded

---

**ANSI/HMMA 867: Commercial - Laminated Core**
1. Application

<table>
<thead>
<tr>
<th>Light Traffic</th>
<th>Commercial</th>
<th>Laminated Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>860</td>
<td>861</td>
<td>867</td>
</tr>
</tbody>
</table>

2. Core

<table>
<thead>
<tr>
<th>Light Traffic</th>
<th>Commercial</th>
<th>Laminated Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel stiffened (welded)</td>
<td>Steel stiffened (welded)</td>
<td>Laminated &amp; steel stiffened</td>
</tr>
</tbody>
</table>

3. Beveled Edge

<table>
<thead>
<tr>
<th>Light Traffic</th>
<th>Commercial</th>
<th>Laminated Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible seam or welded</td>
<td>Welded</td>
<td>Visible seam or welded</td>
</tr>
</tbody>
</table>
ANSI/HMMA Guide Specifications
ANSI/HMMA 862: Commercial Security

1. Application – Commercial Security

2. Door construction:
   - Steel:
     - Cold rolled or galvannealed
   - Steel thickness:
     - Interior or exterior
     - 0.067 in. (1.7 mm) (14 gage)
     - 0.093 in. (2.3 mm) (12 gage)
   - Core: steel stiffened welded to face
   - Edge: Continuous welded

3. Frame construction:
   - Steel thickness:
     - interior or exterior
     - 0.067 in. (1.7 mm) (14 gage)
   - Miters: Continuous welded
# ANSI/HMMA 862: *Commercial Security*

## Six Levels of Security

<table>
<thead>
<tr>
<th>SECURITY RATING</th>
<th>FORCED ENTRY</th>
<th>STATIC LOAD</th>
<th>IMPACT</th>
<th>EDGE CRUSH</th>
<th>JAMBO/WALL STIFFNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CLASSIFICATION</td>
<td>TOOL CATEGORY</td>
<td>TEST LEVEL</td>
<td>SPECIFICATION</td>
<td>MINUTES</td>
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</tr>
</tbody>
</table>

Table 1
1. **Application** – Detention Security

2. **Door construction:**
   - **Steel:**
     - Cold rolled or galvannealed
   - **Steel thickness:**
     - Interior or exterior
     - 0.067 in. (1.7 mm) (14 gage)
     - 0.093 in. (2.3 mm) (12 gage)
   - **Core:** steel stiffened welded to face
   - **Edge:** Continuous welded

3. **Frame construction:**
   - **Steel thickness:**
     - Interior or exterior
     - 0.067 in. (1.7 mm) (14 gage)
   - **Miters:** Continuous welded
ANSI/HMMA 863: Detention Security
# ANSI/HMMA Guide Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Core Type</th>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Light Commercial</td>
<td>Welded Core</td>
<td>HMMA 860</td>
<td>Guide Specification for Hollow Metal Doors and Frames</td>
</tr>
<tr>
<td>Commercial</td>
<td>Stainless Steel</td>
<td>HMMA 866</td>
<td>Guide Specification for Sound Control Hollow Metal Door and Frames Assemblies</td>
</tr>
<tr>
<td>Detention</td>
<td>Laminated Core</td>
<td>HMMA 867</td>
<td>Guide Specification for Stainless Steel Hollow Metal Core Laminated Core</td>
</tr>
</tbody>
</table>
ANSI/HMMA 865: *Acoustical Assemblies*

1. **Application** – Acoustical locations

2. **Door construction:**
   - **Steel:**
     - Cold rolled or galvannealed
   - **Steel thickness:**
     - Interior or exterior
     - 0.042” (1.06mm) (18 gage)
   - **Core:** Laminated honeycomb, foam or acoustical structure
   - **Edge:** varies with construction

3. **Frame construction:**
   - **Steel thickness:**
     - Interior or exterior
     - 0.067 in. (1.7 mm) (14 gage)
   - **Miters:** Continuous welded
ANSI/HMMA Guide Specifications

- Light Commercial
- Commercial Welded Core
- Commercial Security
- Detention Security
- Acoustical Assemblies
- Commercial Stainless Steel
- Commercial Laminated Core
ANSI/HMMA 866: Stainless Steel

1. Application – Corrosive environments

2. Door construction:
   - Stainless steel:
     - Type 316 - Highly Corrosive
     - Type 304 - Moderately Corrosive
   - Finish:
     - #4-satin
     - #8-mirror
     - #2B-mill finish (unfinished)
   - Steel thickness:
     - Interior or exterior
     - 0.042" (1.06mm) (18 gage)
   - Core: Laminated
   - Edge: visible or welded

3. Frame construction:
   - Steel thickness:
     - interior or exterior
     - 0.053" (1.34mm) (16 gage)
   - Miters: KD or welded
ANSI/HMMA 866: Stainless Steel
HMMA documents publish to address specific issues related to the installation and use of HMMA hollow metal products.
Tech Notes: **Defining Undercuts**

Provides dimensional guidelines and clarity for specifying and ordering the correct products based on opening requirements.
Tech Notes: Grouting Hollow Metal Frames

Provides clarity and direction on proper methods of jobsite frame grouting

- Field application
  - Protect frame
  - Can promote rusting
- Why Grout?
  - Specified field application
  - Can improved frame performance
- Use mortar grout
  - Plaster grout not recommended

Grouting Hollow Metal Frames

Grout, when used in accordance with industry guidelines, can improve frame durability, sound deadening, and, depending on wall construction, increase frame anchorage strength. Grouting of the frames does not increase door durability, nor is it required for fire-rated frames. For most commercial applications, grouting of millions and other closed sections is not recommended.


Grout is a water-based product. If not used properly, it can destroy the opening in a very short time. Grout can be either "mortar," which is a masonry mixture of lime, cement, sand, and water, or "plaster," which is a gypsum-based product.

Plaster grout dries by exposure to air. When a frame member is filled with plaster grout, only those areas exposed to air will dry and harden, while the center remains wet (uncured). The water remaining in the plaster grout can rust the frame from the inside. Plaster grout should not be used.

Mortar grout cures by chemical reaction and hardens throughout. Use mortar grout.

Frames are not designed to act as forms for grout. Grout must have a minimum 4 in. slump and be hand troweled in place. Grouting of the frame may be necessary prior to grouting to prevent sagging of the header or bowing of the jambs due to weight or pressure of the grout. Grout should not be installed after gypsum wallboard is installed, as the liquid within the grout will deteriorate the wallboard.

When installed by temperature, air drying agents for mortar may be recommended by specifications. These agents can adversely affect metal, and all surfaces in contact with the grout must be coated with a corrosion resistant material.

It is recommended that the contractor be responsible for the grouting and for any required barrier coating. It is also the responsibility to use care in the application of the grout.

HMMA 820-TN01-03
Tech Notes: Continuously Welded Frames

Provides specification and ordering clarity for frame mitering and welding options:

- Continuous weld
- Face weld
- Knock Down

Definitions and Nomenclature

- Frame Member
- Frame Elements
- Perimeter Joint
Tech Notes: Glazing Transoms, Sidelights and Windows

Provides clarity and direction for proper sealing, glazing and calking on hollow metal by the installing contractor:

- Frames
- Elevations
- Borrowed lights
- Window walls

- Exterior Application
- Air/Water Infiltration
- Tested to Standards
Tech Notes: **Painting Hollow Metal Products**

Provides clarity and direction for proper field painting and finishing of hollow metal products

- **Proper storage**
- **Moisture build up**
- **Repair damaged primer**
- **Primer and top coat compatibility**
- **Avoid high gloss finish paints**
- **Follow manufacturers’ instructions**

**Painting Hollow Metal Products**

Hollow metal doors, frames, and related products are fabricated from hot-rolled, cold-rolled, zinc-coated, or stainless steel. Stainless is typically not painted and therefore not referred to in this tech note. Hot and cold-rolled steel are supplied either dry or oiled and require treatment prior to painting. Zinc-coated steel is either galvanized or galvalume. Galvanized steel is manufactured suitable for high-temperature use without further treatment other than normal cleaning. Galvalume steel requires treatment prior to painting. Refer to HMMA 602, “Manufacturing of Hollow Metal Doors and Frames” for more information.

Hollow metal products must be stored in a manner to prevent exposure to adverse environmental elements. Refer to HMMA 560, “Clarifications for Installation and Storage of Hollow Metal Doors and Frames” for more information. Primer protects the smooth base metal and provides the bonding agent required for the finished paint. It is very important that the primer is protected and dried prior to the application of the finish coat of paint. Primers manufacturers advise that the primer should become a finish coat within 30 days of drying.

Exposure to elements, such as high humidity, salt air, snow, rain, temperature, etc., without proper protection and air circulation allows moisture to be absorbed by the primer. Once this occurs, with the presence of oxygen, an electrochemical action follows. Moisture travels between primer and the metal surface in a capillary action, deteriorating primer adhesion. Eventually this can result in flaking, flaking, flaking, or peeling. When paint failure, flaking, or peeling is not always evident. Typically these areas have not been in constant contact with the elements, but moisture has traveled through the primer.

Breakdown of the primer adhesion can be caused by incompatibility with the finish coat of paint resulting in the same conditions as listed above. Care must be taken to ensure compatibility of primer and any top coats. A small area test is recommended to verify compatibility and adhesion. In some instances, a better coat between primer and top coats is necessary. Consult finish paint manufacturers’ instructions.

Different paint problems have different solutions. Depending on the severity of the problems, sanding, sanding to bare metal, cleaning to remove contaminants, and repriming may be necessary.

The selection of primer is also a consideration. Manufacturing primers are not always visible with a flat low gloss primer but can appear after a gloss finish coat is applied. The use of high gloss paint will increase the show through characteristic and is not recommended. A maximum paint gloss rating of 20% reflectance, measured using 85-degree gloss meter, would be the standard recommendation. Select a commercial direct to metal (DTM) quality paint.

It is extremely important to follow the finish paint manufacturer’s instructions. It is important to avoid painting in extremely hot, cold, or damp weather. Ensure material being painted is clean and dry. Prior to final painting, lightly sand primed surfaces with fine grit sand paper or emery cloth.
Provides a high level overview of HMMA products

1. ANSI/HMMA standards
2. Doors & Frames
3. Construction options
4. Fire ratings
CSI Specifications

- 860 - Light traffic commercial
- 861 - Higher traffic commercial
- 862 - Commercial security
- 863 - Detention security
- 865 - Acoustical Assemblies
- 866 - Stainless steel
- 867 - Laminated cores
Technical Summary HMMA 890

- CSI Specifications
- Fire Ratings
Technical Summary HMMA 890

- CSI Specifications
- Fire Ratings
- Construction options
QUESTIONS?
HMMA HOLLOW METAL MANUAL

Building a Solid Future on the Foundation of Our Successful Past

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Glen Ellyn, IL 60137
630.942.6591
www.hollowmetal.org
THANKS FOR ATTENDING!

- Recording will be available by the end of the week at DHInteractive
- Handouts are available now at DHInteractive
- DHI.org/education to see list of upcoming webinars
- You must sign-up for each session individually