HOLLOW METAL MANUAL

NAAMM STANDARD

HMMA 805-12

METAL DOORS & FRAMES

8d

RECOMMENDED SELECTION and USAGE GUIDE for HOLLOW METAL DOORS and FRAMES

NAAMM HMMA 805-12

NAAMM HMMA 805-12

8d

METAL DOORS & FRAMES

HOLLOW METAL MANUFACTURERS ASSOCIATION

A Division of NAAMM

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

SELECTION and USAGE GUIDE for HOLLOW METAL DOORS and FRAMES

DISCLAIMER

This manual 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 information and guidance on the manufacturing of hollow metal doors and frames. This manual contains advisory information only and is published as a public service by NAAMM and its HMMA Division. NAAMM and its HMMA Division disclaim all liability of any kind for the use, application, or adaptation of material published in this standard. Current information on all NAAMM Standards may be received by calling or writing the National Association of Architectural Metal Manufacturers, or going to www.naamm.org.

Details and information covered in this document are subject to change without notice.

CONTENT:

HMMA 803-08

National Association of Architectural Metal Manufacturers

800 Roosevelt Road, Building C, Suite 312 ● Glen Ellyn, Illinois 60137

Website: www.naamm.org

SELECTION and USAGE GUIDE for HOLLOW METAL DOORS and FRAMES

FOREWARD:

This standard outlines the recommended selection and usage of the HMMA product constructions outlined in the following NAAMM/HMMA standard specifications. Refer to these standards for all construction and specification details. All information covered in this document is current at the time of publication. To verify this information, refer to the most recent edition of all referenced guide specifications.

HMMA 860, "Guide Specifications for Hollow Metal Doors and Frames" - used and specified for hollow metal doors and frames subject to low frequency of usage and low impact probability and less rigorous use.

- Where used: Specific opening in light commercial and light institutional occupancies
- Application: Bathrooms, closets, offices

ANSI/HMMA 861, "Guide Specifications for Commercial Hollow Metal Doors and Frames" - used and specified in commercial work is the continuously welded edge seam construction and it is this type that is the basis of the NAAMM Standard.

- Where used: All openings in commercial and institutional occupancies
- Application: Entrances, stairwells (temperature rise), corridors, meeting rooms, mechanical, etc.

ANSI/HMMA 862, "Guide Specifications for Commercial Security Hollow Metal Doors and Frames" - used and specified in applications where security against vandalism, break-in, or theft is a major concern.

- Where used: Business, high hazard, institutional, military (IBC classifications B, H, I)
- Application: Exterior entrances, pharmaceutical, security locations, etc.

ANSI/HMMA 863, "Guide Specifications for Detention Security Hollow Metal Doors and Frames" - used and specified for detention security.

- Where used: Detention and correctional facilities, institutional, military (IBC classifications B, H, I)
- Application: Exterior entrances, pharmaceutical, security locations in detention facilities, etc.

ANSI/HMMA 865, "Guide Specifications for Swinging Sound Control Hollow Metal Doors and Frames" - used and specified for applications where sound control is a factor.

- Where used: Openings where sound control is a factor (IBC classifications A, E, I, R)
- Application: Patient, operating and exam rooms, band rooms, auditoriums, etc.

ANSI/HMMA 866, "Guide Specifications for Stainless Steel Hollow Metal Doors and Frames" - used and specified when stainless steel is required for corrosion resistance or aesthetics. Where used: Openings exposed to corrosive environments, clean rooms or aesthetic requirements

- Application: Operating rooms, aquatic centers, pharmaceutical and food processing facilities.

ANSI/HMMA 867, "Guide Specifications for Commercial Laminated Core Hollow Metal Doors and Frames" - used and specified for doors incorporating the use of laminated cores.

- Where used: All openings in commercial and institutional occupancies
- Application: Entrances, stairwells (temperature rise), corridors, meeting rooms, mechanical, etc.

HMMA 850, "Fire rated Hollow Metal Doors and Frames" fire rated doors may differ in certain details of construction.

Severe Windstorm Resistant Swinging Door Components and Assemblies: This NAAMM/HMMA document does not address the selection, use and application of door opening products designed to resist the ravages of severe wind storm damages in the geographical areas which are susceptible to hurricane and tornado storms. At the time of publication, there are published standards dictating test procedures and building code requirements being adopting. NAAMM/HMMA manufacturers are conducting tests and investigations, but an industry standard specification has not been published.

Hollow Metal door and frame constructions are designed to meet the various application needs as required by the multitude of architectural requirements in commercial, industrial, institutional, government and detention constructions. The proper selection and specification of product construction, along with proper maintenance and care, are critical to the long term life cycle of the building and the security of the occupants.

Proper selection and specification is made by analyzing criteria such as frequency of use, potential abuse, physical contact, conformance to local building codes and fire code regulations. Consideration must also be given to application requirements such as sound attenuation, insulation requirements, security and architectural design and appearance.

It is the purpose of this standard to present data on current practices within the industry with emphasis on the requirements of the National Fire Protection Association (NFPA) and Model Code (IBC "International Building Code") within the United States Fire testing, listing, labeling and certification services. The building use and occupancy classifications used in this document, follows the structure of the International Building Code (IBC).

SELECTION and USAGE GUIDE for HOLLOW METAL DOORS and FRAMES

SELECTION AND USAGE:

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 the performance requirements 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:

Performance Levels	Duty Minimum thickness (see note #1)	Application & Description
1	**Light Duty** **Frame = 18 gage** 0.042" (1.06) **Door = 20 gage** 0.032" (0.81)	Building areas exposed to low frequency of usage and low probability of impact and abuse (i.e.: closets, offices).
2	**Moderate Duty** **Frame = 16 gage** 0.053" (1.34) **Door = 18 gage** 0.042" (1.06)	Building areas exposed to moderate frequency of usage and moderate probability of impact and abuse (i.e. stairwells, class rooms, meeting rooms).
3	**Heavy Duty** **Frame = 16 gage** 0.053" (1.34) **Door = 16 gage** 0.053" (1.34)	Building areas exposed to high frequency of usage and high probability of impact and abuse (i.e. exterior and service entrances, recreational areas, health care).
4	**Maximum Duty** **Frame = 14 gage** 0.067" (1.70) **Door = 14 gage** 0.067" (1.70)	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)**.**
5	**Detention Security** **Frame = 14 gage** 0.067" (1.70) **Door = 14 gage** 0.067" (1.70)	Building areas required to assure the containment of individuals to designated areas (i.e. cells, control and day rooms in detention and correctional facilities).
6	**Commercial Security** **Frame = 14 gage** 0.067" (1.70) **Door = 14 gage** 0.067" (1.70)	Building areas exposed to elevated threat of intrusion, forced entry or ballistic attack (i.e. infrastructure and government facilities).

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 louvers
    b. Application: sound control, radiation shielding, fire, windstorm, 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 Thicknesses: This document has been prepared as an aid to Architects and Specification Writers. For the purpose of maintaining consistency in terminology, the term "gage" has been used to describe the steel thicknesses of components and reinforcements.
    a. Prior to 1970, sheet steel was referred to by gage. ASTM and ANSI currently do not list gage numbers in their standards. Like many generic terms, gage (or gauge) is ingrained in many vocabularies and is misunderstood as a term for thickness.
    b. All dimensions shown in parenthesis are metric equivalents (millimeters) and do not include the common descriptive abbreviation of (mm).
    c. Refer to NAAMM/HMMA 803 and page #30 of this document for decimal equivalent dimensions.

SELECTION 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 **hour** are based on an 8 hour day, 5 days a week, 52 weeks per year. A guideline for evaluating the usage is shown below:

Frequency of Use	ANSI A250.4 Minimum cycles	Estimated cycles / hr. based on life cycle years					
		5 yrs.	10 yrs.	15 yrs.	20 yrs.	25 yrs.	30 yrs.
Low usage	**250, 000 cycles (Level C)**	**24**	**12**	**8**	**6**	**5**	**4**
Moderate Usage	**500,000 cycles (Level B)**	**48**	**24**	**16**	**12**	**10**	**8**
High Usage	**1,000,000 cycles (Level A)**	**96**	**48**	**32**	**24**	**19**	**16**

NORMAL USE AND OPERATIONS:
ANSI A250.4 is the industry standard performance test for evaluating commercial, industrial and institutional hollow metal doors. This test is performed under laboratory conditions and includes an operable door, frame and hardware with prescribed mechanical opening and closing of the door and periodic twisting. For the purpose of this standard, normal door, frame and hardware use is defined as operations in accordance 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:

Abuse Probability	Abusive Contact / Situation	Opening Examples
Low	- Periodic bumping by elbows, knees or shoulder - Typical manual opening and closing of the door - Cleaning equipment - Foreign objects holding door open	- Offices - Dressing rooms - Private bathrooms - Closets (mechanical, plumbing, electrical)
Moderate	- Aggressive opening and closing - Moderate wind and weather exposure - Propping automatic doors open - Excessive slamming - Wheel chairs - Luggage - Maintenance carts	- Stairwells - Corridors - Public bathrooms - Emergency exit doors - Janitor closets
High	- Potential forced entry - Automatic door operators - Access control - High wind and weather exposure - Gurneys, material handling equipment - Opening doors with body parts other than hand - Bodily impact - Hanging on doors	- Main entrances - Classroom entrances - High volume public access - Kitchens - Mechanical rooms - Medical exam rooms - Operating rooms - Factory, production, warehouse openings - Schools - Interior and service entrances to retail, financial institutions, government facilities
Very High	- High potential forced entry - Vandalism	- Exterior and service entrances to retail, financial institutions, government facilities - Infrastructure access

SELECTION and USAGE GUIDE for HOLLOW METAL DOORS and FRAMES

IBC OCCUPANCY GROUPS:

Individual IBC Group occupancies include a wide variety of building constructions from relatively lower density occupancies (i.e. taverns and churches) to high density occupancies (i.e. arenas and concert halls). Architectural applications are varied depending on building function, aesthetic and security needs.

All openings must be in compliance with the IBC code and the Authority Having Jurisdiction.

For clarity and simplicity, HMMA has targeted typical building examples in select IBC occupancy groups. The building examples include typical door openings prevalent in that building segment construction. Openings are not limited to those outlined in this standard, since additional opening and requirements may be architecturally and functionally required.

Consult NAAMM/HMMA for guidance, selection and specification of opening applications not listed in this standard

OCCUPANCY AND APPLICATIONS:

Door, frame and hardware applications will be dependant on the building type, security requirements and community locations. Security (access control) requirements, being a growing concern, must be considered during architectural and door/hardware specifications development.

DOOR & FRAME CONSTRUCTION:

Applicable door and frame constructions may vary with architectural, aesthetic and durability requirements.

Doors:

Architectural requirements may dictate very basic and light duty construction which could be accommodated by standard sized (i.e. 3'0" X 7'0") and lighter gage (i.e. 20 gage) doors.

If requirements dictate the need for larger door opening (i.e. 3'0" X 7'6" or pairs) with higher levels of access control (electronic hardware), door construction should be upgraded to heavier gage of steel (i.e. 18 or 16 gage) door face sheets.

Aesthetic requirements may dictate the use of doors with optional finishes, textured face sheets or stainless steel doors. Building locations and finances will dictate these enhancements.

Durability and performance influence type of internal door construction and gage of steel will vary depending on the clientele occupying the building and the performance levels required.

Areas of entertainment may require the use of acoustically rated doors to help seal off and/or seal out unwanted sound transmission.

Facilities subjected to higher levels of occupancy abuse may require more durable door constructions.

Facilities with chemical or environmental exposures may require more durable construction.

Frames:

- Architectural – Like doors, the gage for the frame is dependent on the door opening size. Recommendations usually dictate that the frame should be 2 gage thicknesses heavier than the door.

- Aesthetic – Requirements may dictate special frame profiles to enhance the building image and functionality. Transom and side light elevations may also become very desirable to add architectural appeal, natural light and visibility.

- Durability and performance – Like doors, frames construction will vary depending on the clientele occupying the building and the performance levels required.

INFORMATION AIDS:

Additional information related to the selection of the proper Hollow Metal door and frame constructions can be found in the following NAAMM HMMA documents:

- **HMMA 801** - Glossary
- **HMMA 803** - Steel Tables
- **HMMA 810** - Hollow Metal Doors
- **HMMA 820** - Hollow Metal Frames
- **HMMA 840** - Installation and Storage of Hollow Metal Doors and Frames
- **HMMA 850** - Fire Rated Hollow Metal Doors and Frames
- **HMMA 890** - Hollow Metal Technical Summary
- **TechNotes** – Published on various technical topics

.

The following lists the occupancy groups as outlined in the IBC.

Group	Application	Examples
Group A – ASSEMBLY		
A-1	Intended for the production & viewing of performing arts	Theaters, symphony and concert halls
A-2	Uses intended for food and/or drink consumption	Restaurants, taverns, night clubs
A-3	Uses intended for worship, recreation, or amusement	Churches, bowling alleys, museums, libraries
A-4	Uses intended for indoor sporting events	Arenas, swimming pools, skating rinks
A-5	Uses intended for the viewing or participation of outside activities	Bleachers, grandstands, stadiums
Group B - BUSINESS		
B	Use of a building or structure for office, professional or service type transactions	Banks, clinics, laboratories, professional services, civic administration, post offices
Group E - EDUCATIONAL		
E	Use of a building or structure by 6 or more persons for educational purposes through the 12th grade	Grammar, middle and high schools as well as day care facilities
Group F - FACTORY		
F-1	Use of a structure for assembling, fabricating, manufacturing and packaging - Moderate hazard	Furniture, metals, textiles, woodworking, aircraft
F-2	Use of a structure for assembling, fabricating, manufacturing and packaging - Low hazard	Gypsum**,** beverages, brick, glass products
Group H - HIGH HAZARD		
H-1	Buildings that contain materials that pose a detonation hazard	Explosives, organic peroxides, unstable materials
H-2	Buildings that contain materials that pose a conflagration hazard	Flammable gases, combustible dusts
H-3	Buildings that contain materials that readily support combustion	Flammable liquids, combustible fibers
H-4	Buildings that contain materials that pose a health hazard	Corrosive or toxic materials
H-5	Semi-conductor facilities and similar research laboratories in which hazardous production materials are used	Research and development laboratories
Group I – INSTITUTIONAL		
I-1	Buildings housing more than 16 persons on a 24 hour basis because of age or mental disability who live in a supervised residential environment	Assisted living, group homes, convalescent facilities
I-2	Buildings used for medical, surgical, psychiatric or custodial care on a 24 hour basis	Hospitals, nursing homes
I-3	Occupancies that are inhabited by more than five persons who are under restraint or security	Prisons, jails, reformatories
I-4	Buildings that provide custodial care for less than 24 hours	Day care facilities
Group M – MERCANTILE		
M	Buildings for the sale and display of merchandise	Department stores, drug stores, markets
Group R – RESIDENTIAL		
R-1	Occupancies containing sleeping units where occupants are transient	Hotels, motels, boarding houses
R-2	Occupancies containing sleeping units or more than two dwelling units where the occupants are permanent in nature	Apartment houses, convents, dormitories
R-3	Residential occupancies where the occupants are permanent in nature and not classified as R-1, R-2, and R-4	Hotels, motels, boarding houses, apartment houses, convents, dormitories and assisted living facilities
R-4	Residential occupancies for residential care/assisted living including five but not more than 16 persons	Assisted living facilities
Group S – STORAGE		
S-1	Moderate hazard storage	Furniture, grains, lumber, books, sugar
S-2	Low hazard storage	Cement, food products, metals, meats
Group U - UTILITY AND MISCELLANEOUS		
U	Buildings of an accessory nature not classified as any specific occupancy	Barns, carports, sheds, stables, private garages

The following pages include charts with HMMA general recommendations for the selection and usage guidelines for typical entry locations in the most common building constructions.

IBC OCCUPANCY Group A: Assembly

Typical Building Type A-1: Theaters & Concert Halls

Assembly facilities vary greatly in frequency of use, abuse probability and function. Consideration must be given in selecting the door and frame performance levels and construction.

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	High	High			O	●		✚		1	4		2	3	1	2 way vision
2	Service Entrance	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	Stairwells	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
4	Cross Corridor	4	Moderate	Moderate		O	●					1					1	2 way vision
5	Public Restrooms	7	High	Moderate		O	●					1					1	
6	Dressing Room		Moderate	Low	O	●					1						1	Privacy
7	Staff Offices		Low	Low	O	●					1				2		1	Privacy
8	Lounges		High	High			O	●				1	4		2	3	1	Acoustical
9	Kitchen	7	Moderate	High		O	●	✚				1				3	1	2 way vision
10	Cafeteria, Restaurant	7	High	High		O	●	✚				1	4				1	2 way vision
11	Theater, Symphony, Concert Hall	5	Moderate	Moderate		O	●					1			2	3	1	Acoustical
12	Closets		Low	Low	O	●					1						1	
13	Mechanical Room	1, 2, 6	Moderate	High		O	●	✚				1	4		2		1	Louvers
14	Exit Only Function	1, 2	Low	Moderate		O	●	✚				1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group A: Assembly

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Stair tower doors and cross corridor doors in the path of egress, in buildings over 4 stories high must include a minimum 450° F (250° C) temperature rise rating unless exempt by the local building code.
5. Door entering into theaters, symphony and concert halls are recommended to include gaskets to limit sound transmission. Some applications may require a specified STC rating.
6. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
7. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.

SELECTION AND USAGE:
Occupancy group "A" includes a wide variety of building constructions which are designed to accommodate the assembly of people. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

Considerations should be made, but not limited to the following list of items:

Sub-Group A-1: Theaters, symphony and concert halls:
Uses intended for the production and viewing of performing arts.

1. Higher levels of product construction and performance are recommended for entertainment facilities located in areas of higher risk (intrusion, vandalism, etc.) or facilities catering to younger audiences.
2. Electronic security and access control should be considered for all entrances and exits.
3. Entrance doors into individual theater, symphony and/or concert rooms may require the addition of sound sealing gaskets and STC ratings for the operable opening.
4. Higher quality entertainment facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Sub-Group A-2: Restaurants, taverns, night clubs:
Uses intended for food and/or drink consumption.

1. Higher levels of product construction and performance are recommended for facilities located in areas of higher risk (intrusion, vandalism, etc.) or facilities catering to younger audiences.
2. Entrance and exit doors are recommended to include access control.
3. Doors separating kitchen and serving areas should be double acting with vision lights.
4. Higher quality facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Sub-Group A-3: Churches, bowling alleys, museums, libraries:
Uses intended for worship, recreation, or amusement

1. Some religious facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).
2. Higher levels of product construction and performance are recommended for bowling (sports) facilities and ~~on~~ located in areas of higher risk (intrusion, vandalism, etc.) or facilities catering to younger audiences.

Sub-Group A-4: Arenas, swimming pools, skating rinks:
Uses intended for indoor sporting events.

1. Higher levels of product construction and performance are recommended for sports facilities, facilities located in areas of higher risk (intrusion, vandalism, etc.) and facilities catering to younger audiences.
2. Entrance and exit doors are recommended to include access control.
3. Stainless steel products are recommended in areas like swimming pools and skating rinks.

Sub-Group A-5: Bleachers, grandstands, stadiums:
Uses intended for the viewing or participation of outside activities.

1. Higher levels of product construction and performance are recommended for sports facilities and located in areas of higher risk (intrusion, vandalism, etc.) or facilities catering to younger audiences.
2. Entrance and exit doors are recommended to include access control.

IBC OCCUPANCY Group B - Business

Typical Building Type B: Laboratories

Business facilities vary greatly in frequency of use, impact probability and function. Consideration must be given in selecting the door and frame performance levels and construction.

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	High	High			O	●		✚		1	4		2	3	1	2 way vision
2	Service Entrance	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	Stairwells	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
4	Cross Corridors	4	Moderate	Moderate		O	●					1					1	2 way vision
5	Clean Rooms	8	Moderate	Moderate		O	●									3		2 way vision
6	Public Restrooms	7	High	Moderate		O	●					1					1	
7	Staff Offices	5	Low	Low	O	●					1				2		1	Privacy
8	Kitchen	7	Moderate	High		O	●	✚				1				3	1	2 way vision
9	Cafeteria, Lunch Room	7	High	High		O	●	✚				1	4				1	2 way vision
10	Conference Room	5	Moderate	Moderate		O	●					1			2	3	1	2 way vision
11	Closets		Low	Low	O	●					1						1	
12	Mechanical Room	1, 2, 6	Moderate	High		O	●	✚				1	4		2		1	Louvers
13	Entrance between wings	8	High	High		O	●	✚				1	4				1	2 way vision
14	Exit Only Function	1, 2	Low	Moderate		O	●	✚				1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group B - Business

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Stair tower doors and cross corridor doors in the path of egress, in buildings over 4 stories high must include a minimum 450° F (250° C) temperature rise rating unless exempt by the local building code.
5. Doors entering conference and office areas are recommended to include gaskets to limit sound transmission. Some applications may require a specified STC rating.
6. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
7. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.
8. Door and frame constructions for clean room applications vary. Product constructions vary greatly and should be targeted / specified accordingly. Refer to NAAMM / HMMA 866 for direction.
9. May require 3 hour Fire Doors.

SELECTION AND USAGE:
Occupancy group “B” includes a wide variety of building constructions which are designed for office, professional or service type transactions. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

This occupancy group is not sub-divided but includes banks, clinics, laboratories, professional services, civic administration, and post office. Considerations should be made, but not limited to the following list of items:
.

Banks, Post Offices:

1. Higher levels of product construction and performance are recommended for entertainment facilities located in areas of higher risk (intrusion, vandalism, etc.) or facilities catering to younger audiences.
2. Electronic security and access control should be considered for all entrances and exits.

Clinics, Laboratories:

1. Higher levels of product construction and performance are recommended for entertainment facilities located in areas of higher risk (intrusion, vandalism, etc.) or facilities catering to younger audiences.
2. Electronic security and access control should be considered for all entrances and exits.
3. Sound sealing gaskets and STC ratings should be considered on openings to office areas and evaluation rooms.
4. Clean room applications may be required at certain openings.

Professional Services, Civic Administration:

1. Higher levels of product construction and performance are recommended for entertainment facilities located in areas of higher risk (intrusion, vandalism, etc.) or facilities catering to younger audiences.
2. Electronic security and access control should be considered for all entrances and exits.

IBC OCCUPANCY Group E – Educational

Typical Building Type E: High Schools

Education facilities (K-12) vary greatly in function and applications. Generally, these facilities require heavier door constructions specified in HMMA-861 and 867

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	High	High			O	●		✚		1	4		2	3	1	2 way vision
2	Service Entrance	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	Stairwells	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
4	Cross Corridors	4, 8	Moderate	Moderate		O	●					1					1	2 way vision
5	Public Restrooms	7	High	Moderate		O	●					1					1	
6	Infirmary (First Aid) Rooms		Moderate	High			O	●		✚		1			2	3	1	Sanitation
7	Pool Areas	5	High	High			O	●		✚						3		Sanitation
8	Gymnasiums	5	High	High			O	●		✚		1	4			3	1	2 way vision
9	Locker Rooms		High	High			O	●		✚		1	4				1	Privacy
10	Staff Offices		Low	Low	O	●					1				2		1	Privacy
11	Recreation & Lounges	5	High	High			O	●				1	4		2	3	1	Acoustical
12	Kitchen	7	Moderate	High		O	●	✚				1				3	1	2 way vision
13	Cafeteria, Lunch Room	7	High	High		O	●	✚				1	4				1	2 way vision
14	Lecture, Conference, Auditorium	5	Moderate	Moderate		O	●					1			2	3	1	Acoustical
15	Class Rooms	2.5,10	Moderate	High		O	●	✚				1	4		2	3	1	Acoustical, 2 way vision
16	Closets		Low	Low	O	●					1						1	
17	Mechanical Room	1, 2, 6	Moderate	High		O	●	✚				1	4		2		1	Louvers
18	Band Room	5	Moderate	High			O	●				1	4		2			Acoustical
19	Entrance between wings	8, 9	High	High		O	●	✚				1	4				1	2 way vision
20	Exit Only Function	1, 2	Low	Moderate		O	●	✚				1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group E – Educational

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Stair tower doors and cross corridor doors in the path of egress, in buildings over 4 stories high must include a minimum 450° F (250° C) temperature rise rating unless exempt by the local building code.
5. Classroom doors and doors entering into areas of public assembly (band rooms, gymnasiums, auditoriums, etc.) are recommended to include gaskets to limit sound transmission. Some applications may require a specified STC rating.
6. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
7. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.
8. Cross corridor applications may require double egress frames with smoke control and access control hardware.
9. May require 3 hour Fire Doors.
10. Class room doors may require special consideration for enhanced security for protection of students and faculty.

OCCUPANCY GROUP:
Occupancy group “E” includes a wide variety of building constructions which are designed to be occupied by 6 or more persons for educational purposes through the 12th grade. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

This occupancy group is not sub-divided but includes grammar, middle and high schools as well as day care facilities. Considerations should be made, but not limited to the following list of items:

Day care facilities:

1. Electronic security and access control should be considered for all entrances and exits.
2. Standard levels of product construction and performance can be used in day care facilities, however, higher levels of product construction and performance may be considered for educational facilities located in areas of higher risk (intrusion, vandalism, etc.).

Elementary Schools:

1. Higher levels of product construction and performance are recommended for grammar school facilities than for day care facilities or when located in areas of higher risk (intrusion, vandalism, etc.).
2. Electronic security and access control should be considered for all entrances and exits.
3. Entrance doors into individual theater, symphony and/or concert rooms may require the addition of sound sealing gaskets and STC ratings for the operable opening.

Middle Schools:

1. Due to higher levels of product abuse historically encountered in middle school applications, heavy duty product construction and performance is recommended. Higher levels of performance should be considered for educational facilities located in areas of higher risk (intrusion, vandalism, etc.).
2. Electronic security and access control should be considered for all entrances and exits.
3. Entrance doors into classrooms, auditoriums, band rooms and gymnasiums may require the addition of sound sealing gaskets and STC ratings for the operable opening.

High Schools:

1. Due to excessive levels of product abuse historically encountered in high school applications, Level 3 (Heavy Duty) product construction and performance are recommended. Level 4 (Maximum Duty) performance should be considered for educational facilities located in areas of higher risk (intrusion, vandalism, etc.).
2. Electronic security and access control should be considered for all entrances and exits and in certain applications should be considered on classrooms and offices.
3. Entrance doors into classrooms, auditoriums, band rooms and gymnasiums may require the addition of sound sealing gaskets and STC ratings for the operable opening.
4. Higher quality entertainment facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

IBC OCCUPANCY Group F - Factory

Typical Building Type F: Metal Processing Factories

Factories generally require heavier door constructions specified in HMMA-861 and 867

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	Moderate	High			O	●		✚		1	4		2	3	1	2 way vision
2	Employee / Service Entrance	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	Stairwells	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
4	Public Restrooms	7	High	Moderate		O	●					1					1	
5	Offices		Low	Low	O	●					1				2		1	Privacy
6	Kitchen	7	Moderate	High		O	●	✚				1				3	1	2 way vision
7	Cafeteria, Lunch Room	7	High	High		O	●	✚				1	4				1	2 way vision
8	Conference Room	5	Moderate	Moderate		O	●					1			2	3	1	2 way vision
9	Closets		Low	Low	O	●					1						1	
10	Production	5, 8	High	High		O	●	✚				1	4		2		1	2 way vision
11	Mechanical Room	1, 2, 6	Low	Moderate		O	●					1			2		1	Louvers
12	Entrance between wings	8	Moderate	High		O	●	✚				1	4				1	2 way vision
13	Exit Only Function	1, 2	Low	Moderate		O	●	✚				1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group F - Factory

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be Level 3 (Heavy Duty) doors and frames.
4. Stair tower doors in buildings over 4 stories high must include a minimum 450° F (250° C) temperature rise rating.
5. Door entering from conference room or production areas may be required to include gaskets to limit sound transmission. Some applications may require a specified STC rating.
6. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
7. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.
8. May require 3 hour fire rated products.

SELECTION AND USAGE:
Occupancy group "F" includes a wide variety of building constructions which are designed as production facilities. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

Considerations should be made, but not limited to the following list of items:

Sub-Group F-1: **Moderate hazard,**
Furniture, metals, textiles, woodworking, aircraft:
Uses intended for assembling, fabricating, manufacturing and packaging:

1. Electronic security and access control should be considered for all entrances and exits and in certain applications should be considered on offices.
2. Due to excessive levels of product abuse historically encountered in manufacturing facilities, extra heavy duty or maximum duty product construction and performance are recommended at employee entrance areas.
3. Entrance doors from the factory floor to office areas may require the addition of sound sealing gaskets and STC ratings for the operable opening.
4. For medium hazard production facilities, depending on the risk factors involved (employee, product, threats, etc.); bullet and blast resistant products may be a consideration.

Sub-Group F-2: **Low hazard:**
Gypsum, beverages, brick, glass products:
Used for assembling, fabricating, manufacturing and packaging

1. Electronic security and access control should be considered for all entrances and exits and in certain applications should be considered on offices.
2. Due to excessive levels of product abuse historically encountered in manufacturing facilities, extra heavy duty or maximum duty product construction and performance are recommended at employee entrance areas.
3. Entrance doors from the factory floor to office areas may require the addition of sound sealing gaskets and STC ratings for the operable opening.
4. For medium hazard production facilities, depending on the risk factors involved (employee, product, threats, etc.); bullet and blast resistant products may be a consideration.

IBC OCCUPANCY Group H - High Hazard

Typical Building Type H-5: R & D Laboratories

High Hazard facilities vary greatly in function and applications. Corrosion resistant and pressure resistant conditions are likely. Generally, these facilities require heavier door constructions specified in HMMA-861 and 867

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	High	High			O	●		✚		1	4		2	3	1	2 way vision
2	Service Entrance	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	Stairwells	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
4	Clean Rooms	8	Moderate	Moderate		O	●									3		2 way vision
5	Cross Corridors	4	Moderate	Moderate		O	●					1					1	2 way vision
6	Public Restrooms	7	High	Moderate		O	●					1					1	
7	Dressing Room		Moderate	Low	O	●					1						1	Privacy
8	Offices		Low	Low	O	●					1				2		1	Privacy
9	Kitchen	7	Moderate	High		O	●					1				3	1	2 way vision
10	Cafeteria, Lunch Room	7	High	High		O	●					1					1	2 way vision
11	Conference Rooms	5	Moderate	Moderate		O	●					1			2	3	1	Acoustical
12	Closets		Low	Low	O	●					1						1	
13	Labs (Chemical, Analytic, etc)	2	High	High			O	●		✚		1	4			3	1	2 way vision
14	Mechanical Room	1, 2, 5, 9	Low	High		O	●	✚				1	4		2		1	Louvers
15	Entrance between wings	6	High	High		O	●	✚				1	4				1	2 way vision
16	Exit Only Function	1, 2	Low	Moderate		O	●	✚				1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group H - High Hazard

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Stair tower doors and cross corridor doors in the path of egress, in buildings over 4 stories high must include a minimum 450° F (250° C) temperature rise rating unless exempt by the local building code.
5. Doors may be required to include gaskets to limit sound transmission. Some applications may require a specified STC rating.
6. May require 3 hour Fire Doors.
7. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.
8. Door and frame constructions for clean room applications vary. Product constructions vary greatly and should be targeted / specified accordingly. Refer to NAAMM / HMMA 866 for direction.
9. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.

SELECTION AND USAGE:
Occupancy group “H” includes a wide variety of building constructions which are designed explicitly for the production, storage or disposition of volatile material. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele. Considerations should be made, but not limited to the following list of items:

Sub-Group H-1: Explosives, organic peroxides, unstable materials:
Buildings that contain materials which pose a detonation hazard

1. Due to the potential threat levels related to this building construction, premium electronic security and access control is highly recommended for all entrances and exits. Depending on security levels, access control should be considered on targeted offices.
2. Blast and bullet resistant products should be considered on applicable openings.

Sub-Group H-2: Flammable gases, combustible dusts:
Buildings that contain materials which pose a conflagration hazard

1. Due to the potential threat levels related to this building construction, premium electronic security and access control is highly recommended for all entrances and exits. Depending on security levels, access control should considered on targeted offices.
2. Blast and bullet resistant products should be considered on applicable openings.

Sub-Group H-3: Flammable liquids, combustible fibers:
Buildings that contains materials that readily support combustion

1. Due to the potential threat levels related to this building construction, premium electronic security and access control is highly recommended for all entrances and exits. Depending on security levels, access control should be considered on targeted offices.
2. Blast and bullet resistant products should be considered on applicable openings.

Sub-Group H-4: Corrosive or toxic material:
Buildings that contain materials which pose a health hazard

1. Due to the potential threat levels related to this building construction, premium electronic security and access control is highly recommended for all entrances and exits. Depending on security levels, access control should considered on targeted offices.

Sub-Group H-5: Research and development laboratories:
Semi-conductor facilities and similar research laboratories in which hazardous production materials are used

1. Due to the potential threat levels related to this building construction, premium electronic security and access control is highly recommended for all entrances and exits. Depending on security levels, access control should considered on targeted offices.
2. Blast and bullet resistant products should be considered on applicable openings.

IBC OCCUPANCY Group I - Institutional

Typical Building Type I-2: Hospital Facilities

Hospital facilities generally require heavier door constructions specified in HMMA-861 and 86

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	High	High			O	●		✚		1	4		2	3	1	2 way vision
2	Service Entrance	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	Stairwells	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
4	Cross Corridors	4, 9	Moderate	Moderate		O	●					1					1	2 way vision
5	Public Restrooms	7	High	Moderate		O	●					1					1	
6	Patient Rooms	11	Low	Moderate		O	●					1			2		1	Privacy
7	Patient Bath Room	11,12	Low	Moderate	O	●						1					1	Privacy
8	Operating Rooms	11	High	High		O	●					1			2	3		Sanitation
9	Exam Rooms	11	High	High		O	●					1			2	3	1	Sanitation
10	Physical therapy (pools)		High	High		O	●					1				3		Sanitation
11	Clean Rooms	8	Moderate	Moderate		O	●									3		2 way vision
12	Dressing Room	11	Moderate	Low	O	●					1						1	Privacy
13	Offices	5	Low	Low	O	●					1				2		1	Privacy
14	Pharmacy	2	Moderate	Moderate		O	●			✚		1	4				1	Dutch Door
15	Recreation & Lounges		High	High			O	●				1	4		2	3	1	Acoustical
16	Kitchen	7	Moderate	High		O	●	✚				1				3	1	2 way vision
17	Cafeteria, Lunch Room	7	High	High		O	●	✚				1	4				1	2 way vision
18	Lecture, Conference, Auditorium	5	Moderate	Moderate		O	●					1			2	3	1	Acoustical
19	Closets		Low	Low	O	●					1						1	
20	Mechanical Room	1, 2, 6	Moderate	High		O	●	✚				1	4		2		1	Louvers
21	Entrance between wings	8,9	High	High		O	●	✚				1	4				1	2 way vision
22	Exit Only Function	1, 2	Low	Moderate		O	●	✚				1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group I - Institutional

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Stair tower doors and cross corridor doors in the path of egress, in buildings over 4 stories high must include a minimum 450° F (250° C) temperature rise rating unless exempt by the local building code.
5. Doors in private offices and lecture areas are recommended to include gaskets to limit sound transmission. Some applications may require a specified STC rating.
6. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
7. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.
8. May require 3 hour fire rated products.
9. Cross corridor applications may require double egress frames with smoke control and access control hardware.
10. Door and frame constructions for clean room applications vary. Product constructions vary greatly and should be targeted / specified accordingly. Refer to NAAMM / HMMA 866 for direction.
11. Hospital (Cut-off or Terminated) Stops may be required.
12. Bathrooms in patient rooms are usually equipped with emergency release hardware. These doors are usually double acting with center hung pivots.

SELECTION AND USAGE:
Occupancy group "I" includes a wide variety of building constructions which are designed to house and maintain patients in a wide variety of institutionalized living. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

This group is sub divided into the following sub-groups: Due to the wide variety of building types, security requirements will vary drastically. Special considerations must be made for occupancy security. Considerations should be made, but not limited to the following list of items:

Sub-Group I-1: Assisted living, group homes, senior citizen facilities:
Buildings housing more than 16 persons on a 24 hour basis because of age or mental disability who live in a supervised residential environment.

1. Electronic security and access control should be considered for all entrances and exits along with Alzheimer wards, pharmaceutical and office areas.
2. Vision lights may be applicable in locations not usually considered for 2 way vision.

Sub-Group I-2: Hospitals, nursing home:
Buildings used for medical, surgical, psychiatric or custodial care on a 24 hour basis

1. Electronic security and access control should be considered for all entrances, exits along with pharmaceutical, surgical and office areas.
2. Entrance doors to conference areas and offices may require the addition of sound sealing gaskets and STC ratings for the operable opening.
3. Higher quality facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Sub-Group I-3: Prisons, jails detention facilities:
Occupancies that are inhabited by more than five persons who are under restraint or security

1. Maximum Duty and / or Security and Detention Duty product construction and performance is recommended for application in these facilities.
2. Electronic security and access control should be considered for all entrances, exits, cells and areas of separation.
3. Refer to ANSI/HMMA 863, "Guide Specifications for Detention Security Hollow Metal Doors and Frames" for product recommendations in areas of restraint and / or security and depending on inmate level and the required levels of security.

Sub-Group I-4: Day care facilities:
Buildings that provide custodial care for less than 24 hours

1. Electronic security and access control should be considered for all entrances and exits.
2. Standard levels of product construction and performance can be used in day care facilities, however, higher levels of product construction and performance may be considered for educational facilities located in areas of higher risk (intrusion, vandalism, etc.).

IBC OCCUPANCY Group M - Mercantile

Typical Building Type M – Department Store

Mercantile facilities generally require heavier door constructions specified in HMMA-861 and 867

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	High	High			O	●		✚		1	4		2	3	1	2 way vision
2	Service Entrance	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	Public Restrooms	5	High	Moderate		O	●					1					1	
4	Dressing Rooms		Moderate	Moderate	O	●					1						1	
5	Offices		Low	Low	O	●					1				2		1	Privacy
6	Cafeteria, Lunch Room	5	High	High		O	●	✚				1	4				1	2 way vision
7	Closets		Low	Low	O	●					1						1	
8	Mechanical Room	1, 2, 4	Moderate	High		O	●	✚				1	4		2		1	Louvers
9	Exit Only Function	1, 2	Low	Moderate		O	●	✚				1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group M - Mercantile

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
5. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.

SELECTION AND USAGE:
Occupancy group "M" includes a wide variety of building constructions which are designed as buildings for the sale and display of merchandise. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

This occupancy group is not sub divided, but includes constructions such as department stores, drug stores, markets, etc. Considerations should be made, but not limited to the following list of items:

Department Stores:

1. Due to excessive levels of product abuse historically encountered in mercantile applications, extra heavy duty product construction and performance are recommended.
2. Electronic security and access control should be considered for all entrances and exits.
3. Higher quality entertainment facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Drug Stores:

1. Due to excessive levels of product abuse historically encountered in pharmaceutical applications, extra heavy duty product construction and performance are recommended.
2. Electronic security and access control should be considered for all entrances, exits and pharmaceutical areas.

Markets:

1. Due to excessive levels of product abuse historically encountered in pharmaceutical applications, extra heavy duty product construction and performance is recommended.
2. Electronic security and access control should be considered for all entrances, exits and office areas.

IBC OCCUPANCY Group R - Residential

Typical Building Type R-2 – Hotels, Motels

Residential and hospitality facilities vary greatly in applications and opening requirements.

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	**Main Entrance**	1, 2	High	High			O	●		✚		1	4		2	3	1	2 way vision
2	**Service Entrance**	1, 2, 3	High	High			O	●		✚		1	4		2		1	2 way vision
3	**Stairwells**	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
4	**Cross Corridors**	4, 8	Low	Low	O	●					1	1					1	2 way vision
5	**Public Restrooms**	7	High	Moderate		O	●					1					1	
6	**Room Entrances**	2	Low	High		O	●					1			2		1	2 way vision
7	**Communicating** (adjoining rooms)	10	Low	Low	O	●					1	1			2		1	Privacy
8	**Offices**		Low	Low	O	●					1				2		1	Privacy
9	**Kitchen**	7	Moderate	High		O	●					1				3	1	2 way vision
10	**Cafeteria, Restaurant**	7	High	High		O	●					1					1	2 way vision
11	**Lecture, Conference, Auditorium**	5	Moderate	Moderate		O	●					1			2	3	1	Acoustical
12	**Closets**		Low	Low	O	●					1						1	
13	**Mechanical Room**	1, 2, 6	Low	Low	O	●					1	1			2		1	Louvers
14	**Entrance between wings**	8, 9	High	High		O	●					1					1	2 way vision
15	**Exit Only Function**	1, 2	Low	Moderate		O	●			✚		1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group R - Residential

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Stair tower doors and cross corridor doors in the path of egress, in buildings over 4 stories high must include a minimum 450° F (250° C) temperature rise rating unless exempt by the local building code.
5. Sound control may be a factor on exterior entrance doors. These doors are recommended to include gaskets to limit sound transmission. Some applications may require a specified STC rating.
6. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
7. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.
8. Cross corridor applications may require double egress frames with smoke control and access control hardware.
9. May require 3 hour fire rated products.
10. Some adjoining guest rooms include communicating doors/frames. These openings will include a separate door hung in each rabbet. Sound gaskets may be required.

SELECTION AND USAGE:
Occupancy group “H” includes a wide variety of building constructions which are designed to house people. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

Considerations should be made, but not limited to the following list of items:

Sub-Group R-1: Hotels, motels, extended stay facilities:
Occupancies containing sleeping units where occupants are transient

1. Higher levels of product construction and performance are recommended for facilities located in locations of higher risk (intrusion, vandalism, etc.) or facilities catering to younger occupants.
2. Electronic security and access control should be considered for all exterior entrances and exits and rooms.
3. Room doors may require the addition of sound sealing gaskets and STC ratings for the operable opening.
4. Higher quality facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Sub-Group R-2: Apartment houses, dormitories:
Occupancies containing sleeping units or more than two dwelling units where the occupants are permanent in nature

1. Higher levels of product construction and performance are recommended for facilities located in locations of higher risk (intrusion, vandalism, etc.) or facilities catering to younger occupants.
2. Electronic security and access control should be considered for all exterior and individual apartment entrances.
3. Apartment entrances may require the addition of sound sealing gaskets and STC ratings for the operable opening.
4. Higher quality facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Sub-Group R-3: Hotels, motels, extended stay facilities, apartment houses, dormitories & assisted living facilities:
Residential occupancies where the occupants are permanent in nature and not classified as R-1, R-2 or R-4

1. Higher levels of product construction and performance are recommended for facilities located in locations of higher risk (intrusion, vandalism, etc.) or facilities catering to younger occupants and/or dormitory facilities.
2. Electronic security and access control should be considered for all exterior entrances and rooms.
3. Room doors may require the addition of sound sealing gaskets and STC ratings for the operable opening.
4. Higher quality facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Sub-Group R-4: Assisted living facilities:
Residential occupancies for residential care/assisted living including five but not more than 16 persons

1. Electronic security and access control should be considered for all entrances and exits along with Alzheimer wards, pharmaceutical and office areas.
2. Vision lights may be applicable in locations not usually considered for 2 way vision.
3. Higher quality facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

IBC OCCUPANCY Group S – Storage

Typical Building Type S-1: Furniture Warehouse

Storage facilities generally require heavier door constructions specified in HMMA-861 and 867

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	Moderate	High		O	●			✚		1	4		2	3	1	2 way vision
2	Service Entrance	1, 2, 3	Moderate	High		O	●			✚		1	4		2		1	2 way vision
3	Public Restrooms	5	Moderate	Moderate		O	●					1					1	
4	Offices		Low	Low	O	●					1				2		1	Privacy
5	Closets		Low	Low	O	●					1						1	
6	Mechanical Room	4	Moderate	High		O	●					1			2		1	Louvers
7	Warehouse	2	Moderate	Moderate		O	●					1					1	2 way vision
8	Exit Only Function	1, 2	Low	Moderate		O	●			✚		1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group S - Storage

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Service entrances (usually exposed to a higher level of abuse) are recommended to be minimum Level 3 (Heavy Duty) doors and frames.
4. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
5. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.

SELECTION AND USAGE:
Occupancy group “A” includes a wide variety of building constructions which are designed to accommodate the storage of goods. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

Considerations should be made, but not limited to the following list of items:

Sub-Group S-1: Furniture, grains, lumber, books, sugar:
Moderate hazard storage

1. Electronic security and access control should be considered for all entrances and exits and in certain applications should be considered on offices.
2. Due to excessive levels of product abuse historically encountered in storage facilities, extra heavy duty or maximum duty product construction and performance are recommended at employee entrance areas.

Sub-Group S-2: Cement, food products, metals, meats :
Low hazard storage

1. Electronic security and access control should be considered for all entrances and exits and in certain applications should be considered on offices.

Due to excessive levels of product abuse historically encountered in storage facilities, extra heavy duty or maximum duty product construction and performance are recommended at employee entrance areas

IBC OCCUPANCY Group U - Utility And Miscellaneous

Typical Building Type S-1: Parking Garages

Utility facilities generally require heavier door constructions specified in HMMA-861 and 867

Ref No.	Typical Building Openings	Special Notes	Frequency Of Use	Abuse Probability	Door Performance Level						Recommended HMMA Construction Specification							Special Conditions & Options
					1	2	3	4	5	6	860	861	862	863	865	866	867	
1	Main Entrance	1, 2	High	High			O	●		✚		1	4			3	1	2 way vision
2	Service Entrance	1, 2, 3	Moderate	High		O	●			✚		1	4				1	2 way vision
3	Stairwells	1, 4	Moderate	Moderate		O	●					1					1	2 way vision
3	Restrooms	4	Moderate	Moderate		O	●					1					1	
4	Offices		Low	Low	O	●					1				2		1	Privacy
5	Closets		Low	Low	O	●					1						1	
6	Mechanical Room	3	Moderate	High		O	●					1					1	Louvers
7	Exit Only Function	1, 2	Low	High		O	●			✚		1	4				1	

Door Performance Level Guide:

Door performance levels vary with the buildings location and designed function. To help the architect and specification writer, the following variations can be followed:

O = Consideration for areas of low intensity occupation and minor risk of intrusion.

● = Consideration for areas of typical to high risk of abuse, intrusion and /or vandalism.

✚ = Consideration for areas of very high risk of abuse, intrusion and /or vandalism.

HMMA Construction Specification Guide:

The following is a guide to the proper selection and specification of Hollow Metal construction:

1 = Recommended door and frame construction options
2 = Acoustical requirements should be considered
3 = Stainless steel could be used based on function or aesthetics
4 = Commercial security construction is recommended in areas with very high risk of intrusion or severe vandalism.

Special Notes for IBC Occupancy Group U - Utility and Miscellaneous

SPECIAL NOTES:
The following notes correlate to the information and opening matrix covered on the previous page of this standard:

1. Exterior doors and frames are recommended to be zinc coated steel with appropriate weather seals.
2. Security requirements may dictate the need of access control.
3. Mechanical rooms may be required to include louvers to accommodate air flow. For exterior applications see note #1.
4. Consideration should be given to the use of zinc coated steel products due to elevated potential of exposure to cleaning agents and moisture causing corrosion.

SELECTION AND USAGE:
Occupancy group "U" includes a wide variety of building constructions of an accessory nature not classified as any specific occupancy. When selecting and specifying Hollow Metal product for this occupancy group, consideration must be given to the targeted occupancy sub-group, the expected caliber of the facility and the targeted clientele.

Considerations should be made, but not limited to the following list of items:

Barns, Carports, Sheds - These building constructions are usually light or standard duty hollow metal construction.

Stables: Constructions vary radically in quality and durability.

1. Higher quality facilities in thorough bred industries may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

Private Garages: Constructions vary radically in quality and durability.

1. Higher levels of product construction and performance are recommended for entertainment facilities located in locations of higher risk (intrusion, vandalism, etc.) or facilities catering to younger clientele.
2. Electronic security and access control should be considered for all entrances and exits.
3. Higher quality entertainment facilities may aesthetically require products with premium finishes (i.e. stainless steel or factory stained wood grains).

HMMA 805-12 SELECTION OPTIONS

FRAME CONSTRUCTION SELECTION CHART

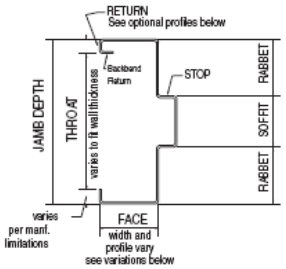
The following chart shows recommended frames for a variety of wall constructions. Locate the wall requirements on the chart that follows. Determine the frame most suitable for the specified usage.

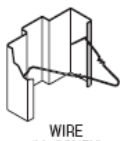
Refer to NAAMM standard HMMA 820 for frame constructions covered in this selection chart.

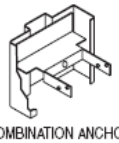
WALL DETAIL AND TYPE	JAMB DEPTH (Size of frame to Specify)				
	4-3/4″ 121mm	5-3/4″ 146mm	6-3/4 171mm	7-3/4″ 197mm	8-3/4″ 222mm
Wrap Around Concrete Block					
4" (102 mm) Masonry Unit	✓				
6" (152 mm) Masonry Unit			✓		
8" (203 mm) Masonry Unit					✓
Butted Masonry					
6" (152 mm) Masonry Unit	✓	✓			
8" (203 mm) Masonry Unit	✓	✓	✓	✓	
Cavity Wall, 4" (101 mm) Masonry Units			✓	✓	✓
Cavity Wall, 6" (152 mm) Masonry Units					✓
Concrete Block and Tile					
Cavity Wall, 4" (102 mm) Masonry Units	✓				✓
4" (102 mm) Masonry Unit, Brick Veneer w/plaster		✓			
4" (102 mm) Masonry Unit, Brick Veneer			✓		
Cavity Wall, 4" (1012 mm) Masonry Unit, Brick Veneer				✓	
Existing Wall					
Poured Concrete or Concrete Block	✓	✓	✓	✓	✓
Wood/Steel Stud Walls					
2' X 3" (50 mm X 76 mm) Wood Stud, 1/2" (13 mm) Wallboard	✓				
Closed Steel Stud, Gypsum	✓	✓	✓	✓	
2" X 4" (50 mm X 76 mm) Wood Stud Gypsum		✓			
2" X 4" (50 mm X 76 mm) Wood Stud, Brick Veneer			✓	✓	
2" X 4" (50 mm X 76 mm) Wood Stud, 5/8" (15 mm) Gypsum				✓	
2' X 4" (50 mm X 76 mm) Wood Stud, ½" (12 mm) & 5/8" (16 mm) Gypsum both sides.				✓	

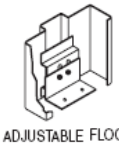
Notes:
1. Size of frame to specify will vary with stud size.
2. Frames can also be used in wall conditions other than those shown below.
3. Frames for these walls can be KD (knock-down) or Welded.

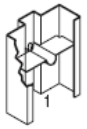
Typical frame details applicable to this page:




WIRE
(MASONRY)


COMBINATION ANCHOR
(MAY BE USED WITH WOOD
OR STEEL STUD)


ADJUSTABLE FLOOR


EXISTING WALL

HMMA 805-12 SELECTION OPTIONS

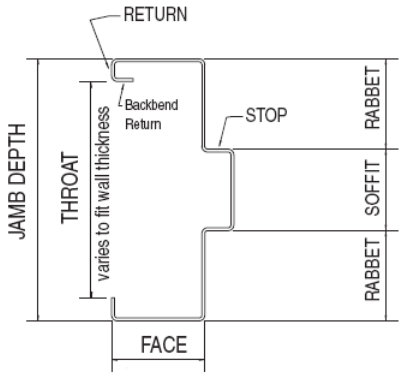
DRYWALL SLIP-ON HOLLOW METAL FRAME CONSTRUCTION SELECTION CHART

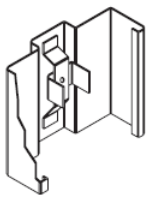
The following chart shows recommended frames for a variety of steel and wood stud drywall wall constructions. Locate the wall requirements on the chart that follows. Determine the frame most suitable for the specified usage.

WALL STUDS		THICKNESSES		JAMB DEPTH (see note # 4)
Size	Type	Drywall	Wall	
1 layer of drywall on each side of the wall				
1-5/8" (41)	STEEL	1/2" (12)	2-5/8" (67)	3-5/8" (92)
1-5/8" (41)	STEEL	5/8" (16)	2-7/8" (73)	3-7/8" (98)
2-1/2" (64)	WOOD OR STEEL	1/2" (12)	3-1/2" (89)	4-1/2" (114)
2-1/2" (64)	WOOD OR STEEL	5/8" (16)	3-3/4" (95)	4-3/4" (121)
2-1/2" (64)	WOOD OR STEEL	3/4" (19)	4" (102)	5" (127)
3-1/2" (89)	WOOD	1/2" (12)	4-1/2" (114)	5-1/2" (140)
3-1/2" (89)	WOOD	5/8" (16)	4-3/4" (121)	5-3/4" (146)
3-5/8" (92)	STEEL	5/8" (16)	4-7/8" (124)	5-7/8" (149)
2 layer of drywall on each side of the wall				
2-1/2" (64)	WOOD OR STEEL	1/2" (12)	4 1/2" (114)	5 1/2" (140)
2-1/2" (64)	WOOD OR STEEL	5/8" (16)	5" (127)	6" (152)
3-1/2" (89)	WOOD	1/2" (12)	5 1/2" (140)	6 1/2" (165)
3 layer of drywall on each side of the wall				
1-5/8" (41)	STEEL	1/2" (12)	4-5/8" (118)	5 5/8" (143)
3-5/8" (92)	STEEL	5/8" (16)	7 3/8" (187)	8 3/8" (213)

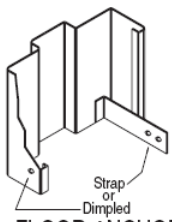
Notes: 1. Size of frame to specify will vary with stud size
2. Frames can also be used in wall conditions other than those shown below
3. Drywall Slip-on frames are supplied knock down (KD)
4. Jamb depth is based on ½" returns

Typical frame details applicable to this page:





COMPRESSION ANCHOR
FOR SLIP-ON DRYWALL FRAMES



FLOOR ANCHOR
FOR SLIP-ON DRYWALL FRAMES

HMMA 805-12 SELECTION OPTIONS

The following chart has been compiled as a reference to the construction features of the doors and frames covered in the HMMA construction specifications.

Door Construction	HMMA SPECIFICATION CONSTRUCTIONS						
	860-92 Light Duty	**861-06** Commercial	**862-03** Security	**863-04** Detention	**865-03** Acoustical	**866-01** Stainless	**867-06** Laminated
Face Sheets • Int. locations • Ext. locations	20 Gage 18 Gage	18 Gage 16 Gage	14 Gage 12 Gage	14 Gage 14 Gage	18 Gage 18 Gage	18 Gage 18 Gage	20 Gage 18 Gage
Core	Steel	Steel	Steel	Steel	Honeycomb Foam, Steel Or Acoustical	Honeycomb Foam Or Steel	Honeycomb Foam. Steel Or Temp rise.
Edge	Beveled	Beveled	Beveled See note # 1	Beveled See note # 1	N. A.	Beveled	Beveled or Square Hinge See note #1 See note #2
Edge Seams	Visible seam: Option: Filed or Welded	Continuous Welded	Continuous Welded	Continuous Welded	N. A.	Visible seam: Option: Filed or Welded	Visible seam: Option: Filed or Welded
Reinforcements							
• **Hinge**	7 Gage	7 Gage	6 Gage	6 Gage	7 Gage	7 Gage or 10 Gage	7 Gage
• **Strike**	N. A.	12 Gage	6 Gage	6 Gage	N. A.	14 Gage	14 Gage or 16 Gage See note #4
• **Flush bolts**	14 Gage	12 Gage	N. A.	N. A.	N. A.	N. A.	N. A.
• **Closers**	16 Gage	12 Gage	12 Gage	12 Gage	14 Gage	16 Gage	16 Gage
• **Lock Front**	14 Gage	12 Gage	12 Gage	12 Gage	12 Gage	14 Gage or 16 Gage See note #4	14 Gage or 16 Gage See note #4
Frame Construction	**860-92** Light Duty	**861-06** Commercial	**862-03** Security	**863-04** Detention	**865-03** Acoustical	**866-01** Stainless	**867-06** Laminated
Steel thickness: • **Interior** • **Exterior**	16 Gage See note #3 16 Gage	16 Gage 16 Gage	14 Gage 14 Gage	14 Gage 14 Gage	14 Gage 14 Gage	16 Gage 16 Gage	16 Gage See note #3 16 Gage
Corner Construction	Welded or KD / Slip-on	Welded	Continuous Weld	Continuous Weld	Welded	Welded Or KD / Slip-on	Welded Or KD / Slip-on
Reinforcements:							
• **Hinge**	7 Gage	7 Gage	7 Gage	7 Gage	7 Gage	7 Gage or 10 Gage See note #4	7 Gage or 10 Gage See note #4
• **Strike**	12 Gage	16 Gage or 12 Gage See note #4	7 Gage	7 Gage	12 Gage	12 Gage	12 Gage
• **Flush bolts**	12 Gage	12 Gage	7 Gage	7 Gage	12 Gage	12 Gage	12 Gage
• **Closers**	12 Gage	12 Gage	7 Gage	7 Gage	12 Gage	12 Gage	12 Gage

NOTES:
1. For double acting doors, door edges will be bull nosed or include radiuses.
2. Hinge edge may be square.
3. Interior frames for hollow wood core doors may be 18 gage.
4. Lighter gage steel may be used for reinforcements if the screw attaching holes are extruded to equal depth as the heavier gage.
5. Refer to NAAMM/HMMA 803 for decimal equivalent dimension

HOLLOW METAL MANUAL

NAAMM Standard HMMA 803-08

STEEL TABLES

Prior to 1970, sheet steel was referred to by gage. ASTM and ANSI currently do not list gage numbers in their standards. Like many generic terms, gage (or gauge) is ingrained in many vocabularies and is misunderstood as a term for thickness. NAAMM is publishing this minimum thickness table to be used instead of discontinued gage numbers.

The decimal inch values shown were taken from the Underwriters Laboratories, Inc. publication for gage number and equivalent thickness. Corresponding metric values are included for reference purposes only.

MINIMUM THICKNESS		
Uncoated Steel Sheet		
Gage	Decimal	mm
4	0.214	5.43
5	0.199	5.05
6	0.184	4.67
7	0.167	4.24
8	0.152	3.86
10	0.123	3.12
12	0.093	2.36
14	0.067	1.70
16	0.053	1.34
18	0.042	1.06
20	0.032	0.81
22	0.026	0.66
24	0.020	0.50
26	0.016	0.40
28	0.013	0.33

CONVERSION		
Fraction	Decimal	mm
	1.000	25.40
15/16	0.937	23.81
7/8	0.875	22.22
13/16	0.812	20.63
3/4	0.750	19.05
11/16	0.687	17.46
5/8	0.625	15.87
9/16	0.562	14.28
1/2	0.500	12.70
7/16	0.437	11.11
3/8	0.375	9.52
5/16	0.312	7.93
1/4	0.250	6.35
3/16	0.187	4.76
1/8	0.125	3.17
1/16	0.062	1.58

DISCLAIMER

This sheet was developed by representative members of the Hollow Metal Manufacturers Association Division (HMMA) of the National Association of Architectural Metal Manufacturers (NAAMM) to provide their opinion and guidance on minimum thickness and corresponding metric equivalents used for hollow metal doors and frames. This sheet contains advisory information only and is published as a public service by the HMMA Division. NAAMM and its HMMA DIVISION DISCLAIM ALL LIABILITY OF ANY KIND FOR THE USE, APPLICATION OR ADAPTATION OF MATERIAL SHOWN ON THIS SHEET.

HMMA Hollow Metal Manufacturers Division of the

National Association of Architectural Metal Manufacturers NAAMM

RECOMMENDED GUIDE SPECIFICATIONS FOR HMMA HOLLOW METAL DOORS AND FRAMES

✓ **HMMA 860**
Guide Specifications for Hollow Metal Doors and Frames

✓ **ANSI/HMMA 861**
Guide Specifications for Commercial Hollow Metal Doors and Frames

✓ **ANSI/HMMA 862**
Guide Specifications for Security Hollow Metal Doors and Frames

✓ **ANSI/HMMA 863**
Guide Specifications for Detention Security Hollow Metal Doors and Frames

✓ **ANSI/HMMA 865**
Guide Specifications for Swinging Sound Control Hollow Metal Doors and Frames

✓ **ANSI/HMMA 866**
Guide Specifications for Stainless Steel Hollow Metal Doors and Frames

✓ **ANSI/HMMA 867**
Guide Specifications for Commercial Laminated Core Hollow Metal Doors and Frames