TECHNICAL INFORMATION

MPI doors and frames

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0914

Product Technical Information
MPI Hollow Metal Doors and Frames

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Product Technical Information
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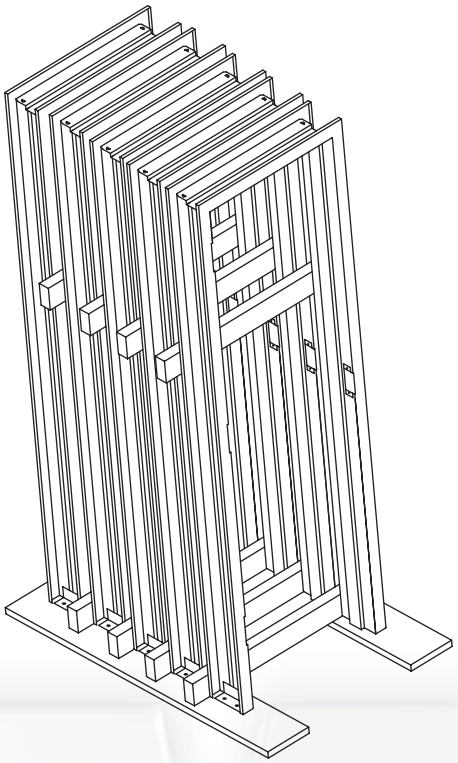
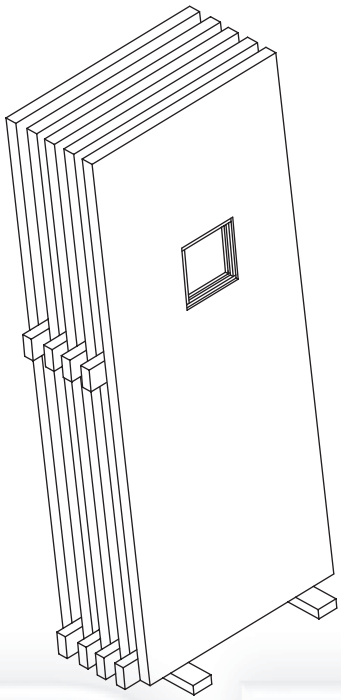
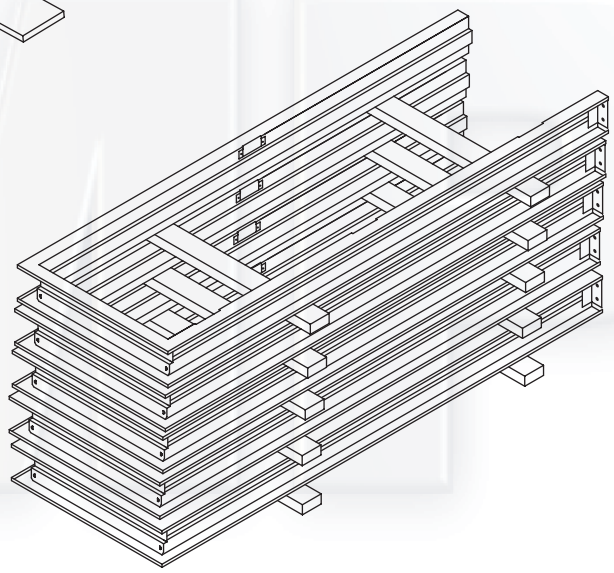






STORAGE INSTRUCTIONS

Any wraps or covers shall be removed from doors and frames upon receipt at the jobsite or storage facility. Any scratches or abrasions received during shipping and handling are to be promptly cleaned and repainted with a rust inhibitive primer.

All material must be stored on planks or dunnage in a dry location. Doors shall be stored in a vertical position with blocking and frames shall be stored with blocking as shown in the diagrams.

If material is covered during storage, ample air circulation must be provided between units. Failure to follow these instructions may result in deterioration of the shop primer resulting in corrosion of the steel. See MPI technical publication TDG 2 for additional information.

TDG 1

Onsite Storage

CARE OF PRIME PAINTED STEEL

GENERAL:
MPI doors and frames are designed to meet the requirements of ANSI A250.8. Products receive a factory applied primer. The primer has been tested and certified to meet the passing criteria set forth in ANSI A250.10 *Test Procedure and Acceptance Criteria for Prime Painted Steel Doors and Frames.*

SURFACE PREPARATION:
In order to ensure proper prime paint adhesion, all MPI steel doors and frames are pretreated prior to the application of the prime paint. All exposed surfaces are thoroughly cleaned and phosphatized during the critical pretreatment process.

PRIMERS:
After proper surface preparation, MPI doors and frames shall be finished with one coat of factory baked-on, rust inhibitive primer. The primer is applied to all visible/exposed surfaces of the products in accordance with ANSI A250.10 *Test Procedure and Acceptance Criteria for Prime Painted Steel Doors and Frames.*

MPI primer test results are as follows:

Salt Spray	120 Hours
Humidity	240 Hours
Impact	Passed
Adhesion	Passed

FIELD PROCEDURES:
The high grade baked-on prime paint furnished on MPI doors and frames provides high quality protection against corrosion and abrasion. It provides an excellent base for finish paint applications. The primer itself is not finish paint and requires finish painting in the field. All surface damage must be repaired and reprimed with a compatible rust inhibitive primer prior to applying the finish paint. All surfaces must be thoroughly cleaned prior to finish painting.

Application of finish paint shall be in accordance with the paint manufacturer's recommendations. Curing times vary with the type of paint used and are influenced by atmospheric conditions. Avoid using lacquer thinner or other solvents as they may have an adverse reaction upon the primer. Some types of finish paint require repriming of all previously primed surfaces.

STORAGE:
Proper storage and handling procedures are essential in ensuring that factory primed surfaces are ready to receive finish paint. Upon receipt at the jobsite or storage facility, all doors and frames must be thoroughly inspected. When present, wrapping material is to be removed. Abrasions or scratches received during shipping and handling are to be sanded, cleaned and repainted with a rust inhibitive primer.

Material must be stored on planks or dunnage in a dry location. Doors and frames shall be stored in a vertical position and spaced by blocking. See MPI technical publication TDG 1 for additional information. If material is covered during storage, ample air circulation must be provided between units.

NOTE: Paint manufacturers advise that primed doors and frames should receive a finish coat of paint within 30 days of delivery. Surfaces must be sanded, cleaned and touched up prior to finish painting.*

Failure to follow the instructions and procedures herein may create conditions that will permit deterioration of the shop primer, resulting in corrosion of the steel.

*Ref. HMMA 840-07 *GUIDE SPECIFICATION FOR INSTALLATION AND STORAGE OF HOLLOW METAL DOORS AND FRAMES*

LEED Rating System

The USGBC (U.S. Green Building Council) has created the LEED (Leadership in Energy and Environmental Design) Green Building Rating System New Construction (NC), Core and Shell (CS), Schools (S) and Commercial Interiors (CI). The LEED Rating System establishes the criteria for what constitutes a "green building". The intent of the system is to establish guidelines to ensure attention is given to utilization of natural resources, site selection, site preparation, site development, pollution and building materials selection.

Section MR 4.1 & MR 4.2 Materials and Resources- Recycled Content LEED NC, CS, S, CI

LEED MR 4.1 states the minimum requirement is 10% and MR 4.2 is 20%. Steel used by MPI exceeds these requirements. The recycled content value of a material assembly is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value. Doors and frames from MPI contain recycled content and contribute toward this credit

Section MR 5.1, 5.2 Local/Regional Materials

Contact factory for specific information regarding L/R Materials

No measurable latent VOC emissions exist in products at the time of shipping. This is not applicable to products receiving factory applied bituminous back coating.
There is no lead or mercury contained in the packaging of products manufactured by MPI.

Individual building products are not certified as being LEED compliant, only buildings. However, products manufactured by MPI are LEED compliant as far as being within the parameters of the LEED Rating System as it relates to recycled content.*

Specification sheets, material safety data information and/or confirmation letters from our suppliers are on file. Copies are available upon request.

*Statement is based on careful evaluation of the referenced rating system as it applies to the products manufactured by The MPI Group, LLC. This information has no implied warranty or merchantibility or implied warranty of fitness for a particular purpose or any other warranty, expressed or implied. This statement is for general information. Contact factory for job specific information and for possible credits for Local/Regional materials.

Warranty

Seller warrants only to its distributors, other direct buyers for resale and other direct buyers for commercial and industrial use that it will, at its option and sole discretion, furnish, F.O.B. Corbin, Kentucky, a replacement for repair or refund the purchase price to such buyer of any goods of its manufacture or part or portion thereof proved to its satisfaction to be defective in workmanship or material under normal use and service within one year (365 days) from the date of delivery to such distributor or such direct buyer, provided notice of such defect is given to seller within such one year (365 days) period. Our obligation will also terminate at any time anyone other than our company performs any work or repair, service or replacement on the item without our prior written consent. This warranty excludes products that are abused, misused, improperly installed or installed in a location other than that for which specified.

There is no implied warranty of merchantability or implied warranty of fitness for a particular purpose or any other warranty, express or implied, and seller will not be responsible for any damages whatsoever, or for any labor, transportation or other costs or expenses relating to such replacement or such repair, including any indirect, incidental or consequential damages.

The MPI Group, LLC
Custom Hollow Metal Doors and Frames
Corbin, KY 40701

AMERICAN MADE

CERTIFICATE OF ORIGIN and ARRA STATEMENT

This is to certify that the steel used in manufacturing hollow metal doors and frames is acquired from mills located in the United States of America.

All doors and frames are designed and manufactured at our facility located in Corbin, Kentucky United States of America.

Products manufactured are in compliance with Section 1605 of the American Recovery and Reinvestment Act of 2009 as it relates to goods produced in the United States.

Product and Compliance Information

Test Standards

ASTM C1363-05- *Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus*
ASTM C1199-09- *Test Method for Measuring the Steady-State Thermal Transmittance of Fenestration Systems Using Hot Box Methods*
ASTM E1423-06- *Practice for Determining Steady State Thermal Transmittance of Fenestration Systems*

Thermal performance tests measure a door's thermal conductivity known as "U-Factor" and its inverse which is termed thermal resistance or R-Value. U-factors have units in the Inch-Pound system of BTUs per hour per square foot per degree (Fahrenheit) or Btu/hr-ft2-F. R-values have the rather unintuitive units of: hr-ft2-F/Btu. U-factor is based on measured heat flow through a sample at the temperature difference of the air on the indoor and outdoor sides.

New test criteria provide realistic values representative of actual room conditions and are based on the full surface of an operable door rather than just the center portion of the door surface as with old test procedures.

ASTM C1363 alone is not intended to determine performance of fenestration systems. ASTM C1199 has been established for this purpose and is used in conjunction with ASTM E1423 and ASTM C1363. (Source reference ASTM C1363, Scope, para 1.8- *http://www.astm.org/Standards/C1363.htm*)

Door Type	R- Value	U-Factor
18 ga. Polyiso Flush	2.75	0.36
18 ga. Polyiso 6 Panel	2.69	0.37
18 ga. Polystyrene Flush	2.56	0.39
18 ga. Polystyrene 6 Panel	2.45	0.41
18 ga, Steel Stiffened Flush (250 TR)	1.75	0.57
16 ga. Polyiso Flush	2.66	0.38
16 ga. Polystyrene Flush	2.57	0.39
16 ga. Steel Stiffened Flush (250 TR)	1.71	0.58
14 ga. Steel Stiffened Flush (250 TR)	1.78	0.56

Results are representative of standard production items

Product and Compliance Information

Test Standards
- ASTM E90-09- *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*
- ASTM E 413- *Classification for Rating Sound Insulation*
- ASTM E1332- *Standard Classification for Rating Outdoor-Indoor Sound Attenuation*

Door Design
- Steel stiffened based proprietary core 14 gauge flush

Hardware Options Tested
- Cylindrical lock
- Mortise lock
- Regular heavy weight butt hinges

Operable standard polystyrene core available with STC 28 (18 gauge std. const. Pemko seals)

Operable standard temp rise available with STC 36 (18 gauge std. const. Pemko seals)

Inoperable proprietary polystyrene based core available with STC 43 (16 gauge)

Fully sealed (tested inoperable) units may be provided with or without seals and gasketing

All doors tested single swing with grouted frame

Lock	STC*	OITC*	Zero International Sealing Systems
Mortise	49	38	770A head and jambs, 564 threshold, 119WB bottom rail
Mortise	48	38	770A head and jambs, 564 threshold, 119WB bottom rail
Cylindrical	48	38	770A and 119WB head and jambs, 367 auto bottom, 564 threshold
Cylindrical	47	38	770A and 119WB head and jambs, 367 auto bottom, 564 threshold
Cylindrical	49	38	770A and 119WB head and jambs, 367 auto bottom, 564 threshold
Cylindrical	48	38	770A and 119WB head and jambs, 367 auto bottom, 564 threshold
Cylindrical	49	38	770A and 119WB head and jambs, 564 threshold
Cylindrical	39	36	770A head and jambs, 564 threshold
Mortise	48	38	770A and 119WB head and jambs, 564 threshold
Mortise	48	38	770A and 119WB head and jambs, 367 auto bottom, 564 threshold
Mortise	51	39	Sealed with duct seal both sides (inoperable)
Cylindrical	52	39	Sealed with duct seal both sides (inoperable)

*STC- Sound Transmission Class *OITC- Outdoor/Indoor Transmission Class

Product and Compliance Information

Test Standards

ANSI A250.13- *Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies*
ASTM E330-02- *Standard Test Method for Structural Performance of Exterior Windows, Doors Skylights and Curtain Walls by Uniform Static Air Pressure Difference*
ASTM E1886-05- *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*
ASTM E1996-09- *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes, Missile D, Wind Zone 4*
ASTM E1996-06- *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes, Missile D, Wind Zone 4*

Door Design

Steel stiffened HMMA 861 specification

Windspeed- 140 mph

Large missle impact- 15 lbs

Design pressure- 70 psf +/-

Frame jamb depths- $5\frac{3}{4}$" - 10"

Fire-rated for exterior application up to $1\frac{1}{2}$ hours

IBC compliant

State of Florida DBPR approved

Single Opening (door and frame)

3'0x7'0 max
16 gauge min.- CR, A60, SS
Hardware:
- Cylindrical lock
- Mortise lock
- Mortise deadbolt
- Mortise exit device
- Rim exit device

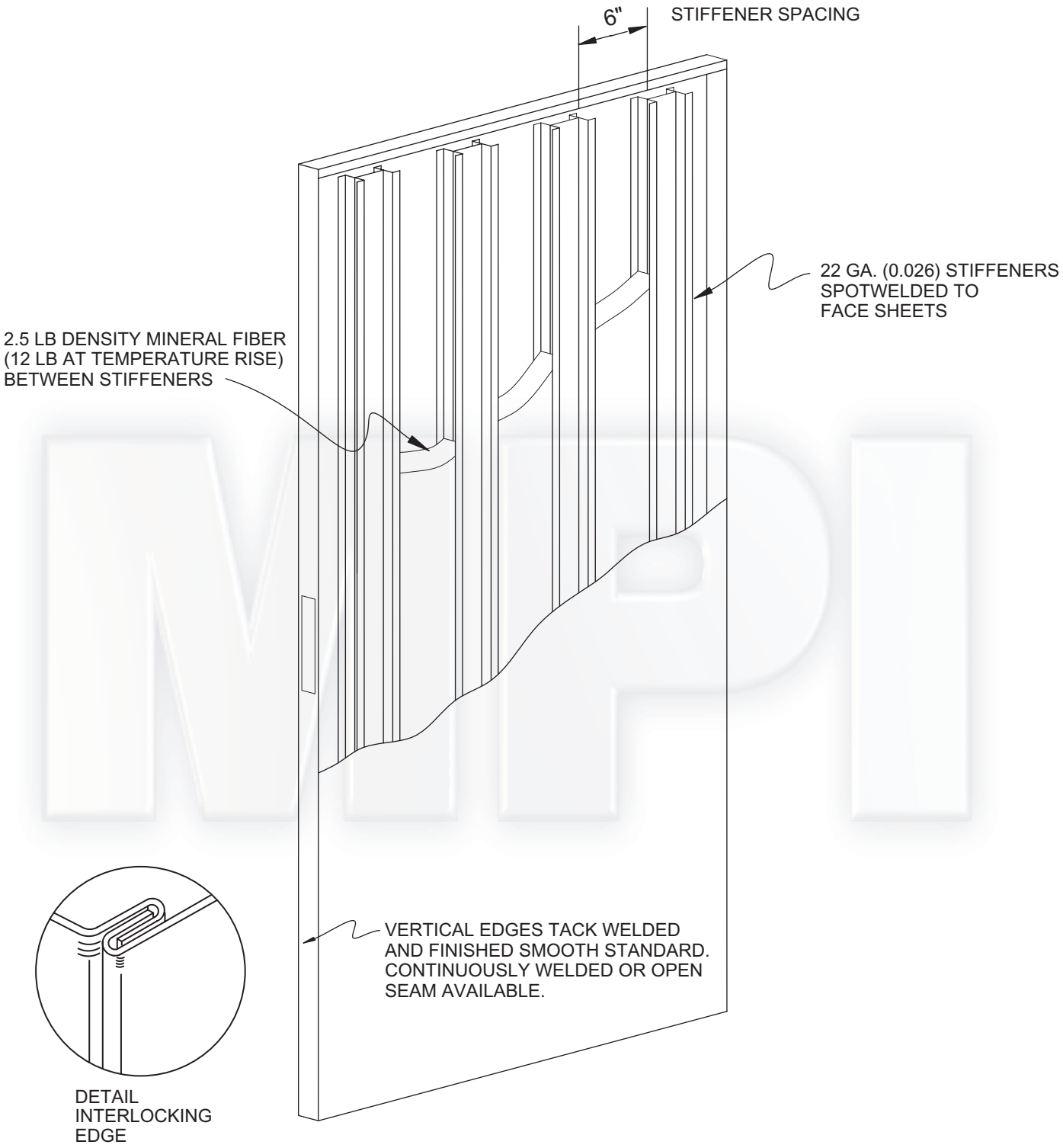
Pair Opening (door and frame)

6'0x7'0 max
16 gauge min.- CR, A60, SS
Hardware:
- Cylindrical lock/Surface bolt
- Mortise lock/Surface bolt
- Mortise deadbolt/Surface bolt
- Mortise exit device/Surface bolt
- Mortise exit device/Concealed vertical rod
- Mortise exit device/Surface vertical rod
- Rim exit device/Rim exit device/Hardware mullion
- Concealed vertical rod/Concealed vertical rod
- Surface vertical rod/Surface vertical rod

Product certification, validation and labeling for fire and windstorm by Underwriters Laboratories

HOLLOW METAL DOORS

- MPI custom doors are manufactured to the highest industry standards with many features exceeding the minimum requirements set forth in those standards.
- Fabrication is in accordance with HMMA 860, HMMA 861 and ANSI-A250.8.
- MPI doors have been tested and certified as exceeding by three million cycles the endurance performance testing prescribed by ANSI A250.4 for Level A doors.
- Doors are available with steel-stiffened internal construction or with closed cell polystyrene core. Face sheets are manufactured from cold-rolled steel, A60 galvanealled, G90 zinc-coated or stainless steel.
- Fire ratings are available for all door types up to and including 3 hour A-label in positive pressure in accordance with UBC 7-2 and UL 10C.
- MPI is constantly seeking ways to improve products. Changes in design and specifications are made from time to time in order to implement these improvements. MPI reserves the right to do so without notice and without obligation to incorporate such changes to any product previously manufactured.

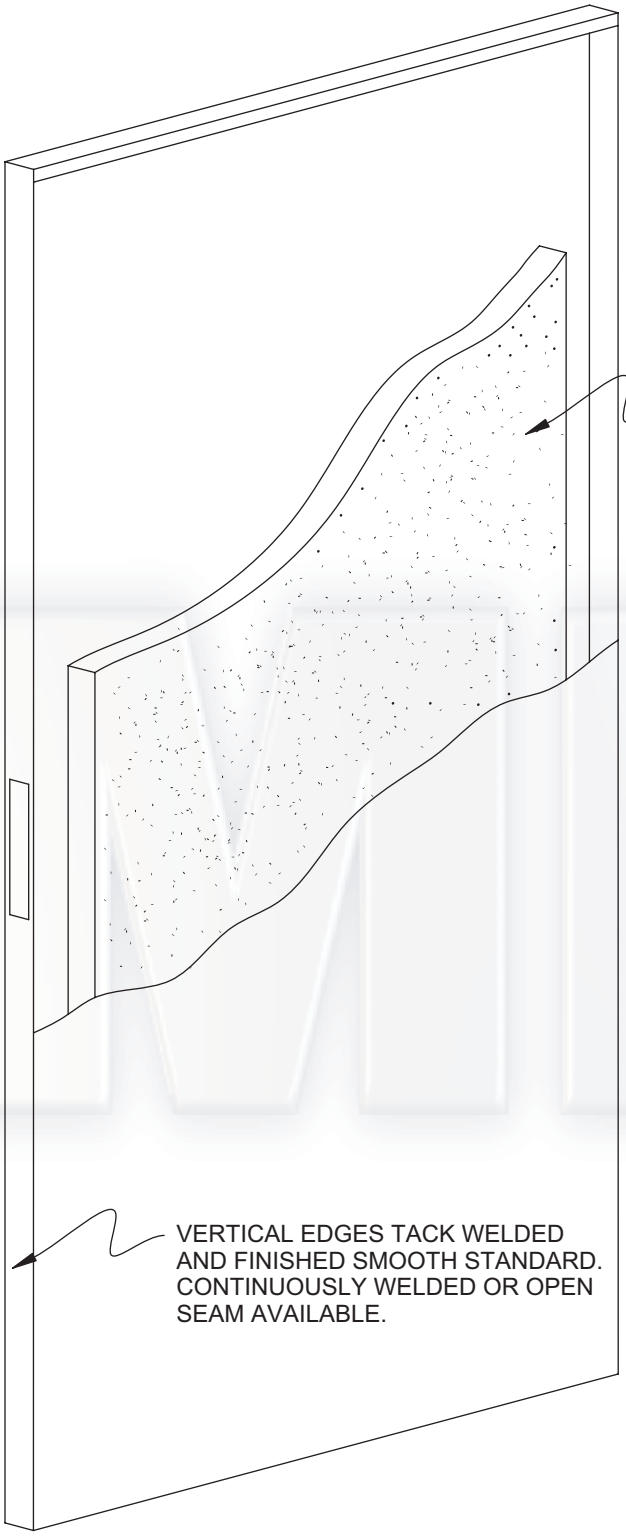


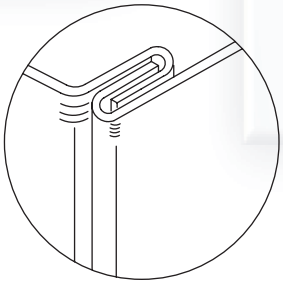
Conforms to HMMA 861

Vertically Steel Stiffened Hollow Metal Door

Steel Stiffened Door

TDD I





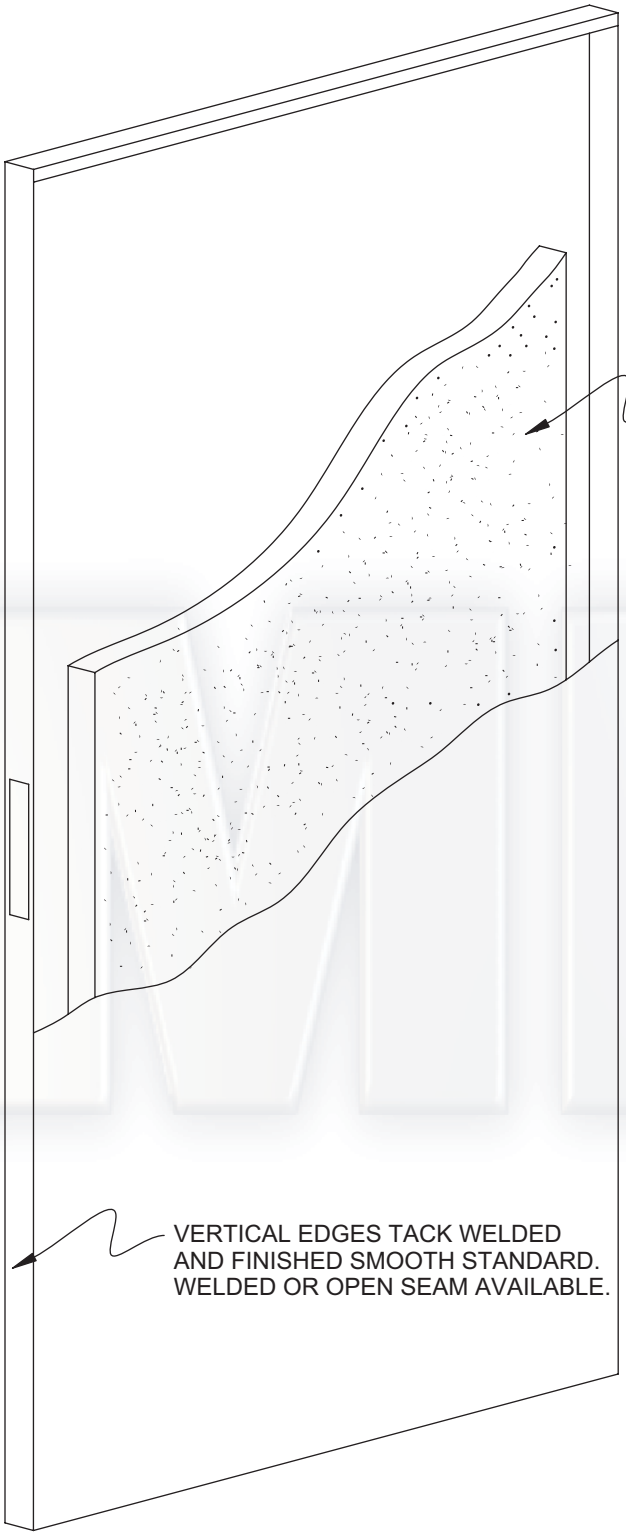
DETAIL
INTERLOCKING
EDGE

Conforms to HMMA 867

Laminated Core Hollow Metal Door

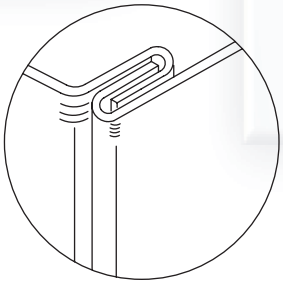
Polystyrene Door

TDD 2



POLYISOCYANURATE CORE
R VALUE 10.0, U VALUE .100
RIGID PRE-FORMED CLOSED CELL BOARD
2 LB./FT^3 DENSITY AVG.
CONFORMS TO ASTM D2856

VERTICAL EDGES TACK WELDED
AND FINISHED SMOOTH STANDARD.
WELDED OR OPEN SEAM AVAILABLE.



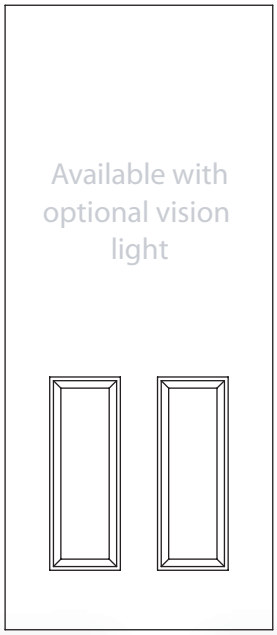
DETAIL
INTERLOCKING
EDGE

Conforms to HMMA 867

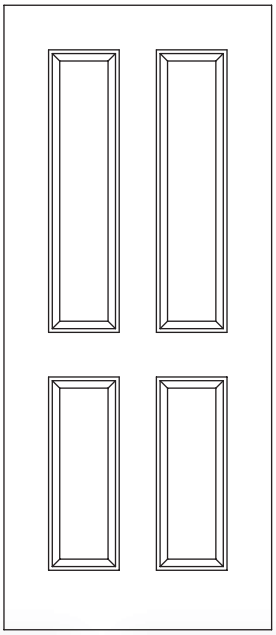
Laminated Core Hollow Metal Door

Polyiso Door

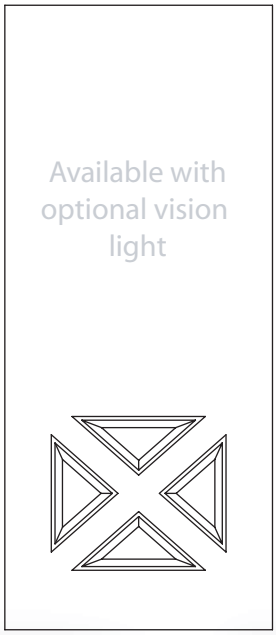
TDD 2A



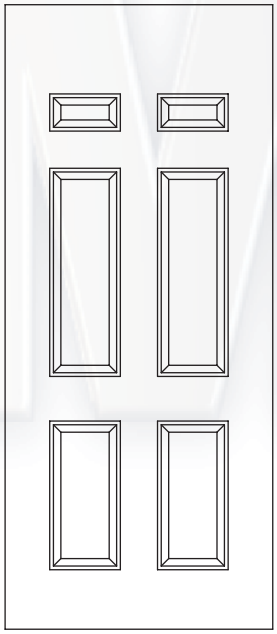
2 Panel Door



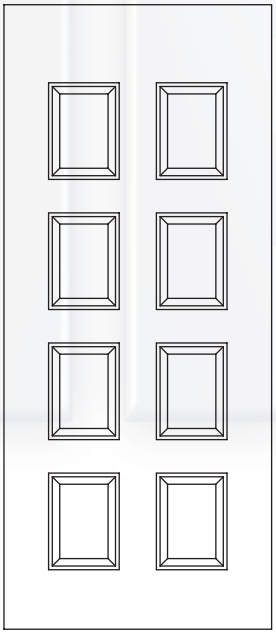
4 Panel Door



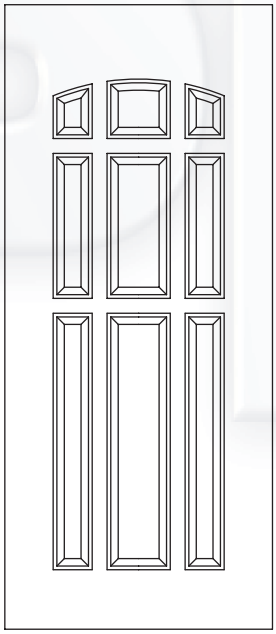
4 CB Panel Door



6 Panel Door



8 Panel Door



9 Panel Door

Doors have polystyrene core (U= .156, R= 6.4), rigid preformed closed cell board
1 lb. density (Min.) - Conforms to ASTM C578, Type 1
May be fire-rated up to 3 hours- pairs and singles
Consult factory for details and additional information

Embossed Panel Doors

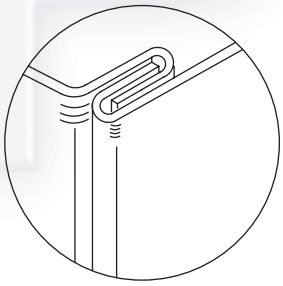
Conforms to HMMA 867
Laminated Core Hollow Metal Door

Door face sheets shall be manufactured from [Type 304] [Type 316] stainless steel conforming to ASTM A 666. Finish shall be #4 Satin.

Door edges shall be joined by a continuous interlocking seam the full height of the door (lock seam), resulting in a visible vertical seam at both edges of the door.

Internal Construction:
Steel Stiffened: The door shall be stiffened by continuous vertically formed steel sections which, upon assembly, shall span the full thickness of the interior space between door faces. These stiffeners shall be 0.026 in. (0.6 mm) minimum thickness,spaced so that the vertical interior webs shall be no more than 6 in. (152 mm) apart and securely fastened to both face sheets by welds spaced a maximum of 5 in. (127 mm) o.c. vertically. Spaces between stiffeners shall be filled with fiberglass or mineral rock wool batt-type material. Stiffeners shall be [Type 304 stainless steel] [Type 316 stainless steel]

Laminated Core: Door face sheets shall be stiffened by a polystyrene foam core that is laminated with adhesive under pressure between the face sheets. Polystyrene core is rigid, pre-formed closed cell board, 1 lb. density minimum in accordance with ASTM C578, Type 1.



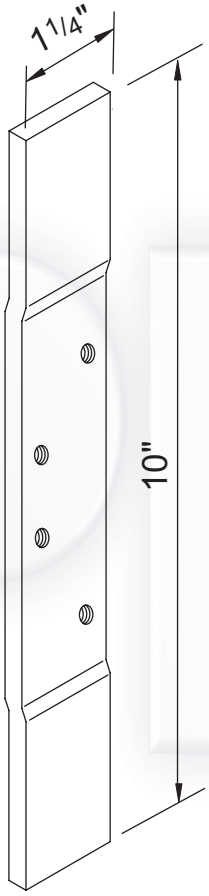
DETAIL
INTERLOCKING
EDGE

Conforms to HMMA 866

Stainless Steel Hollow Metal Door

Stainless Steel Door

TDD 4



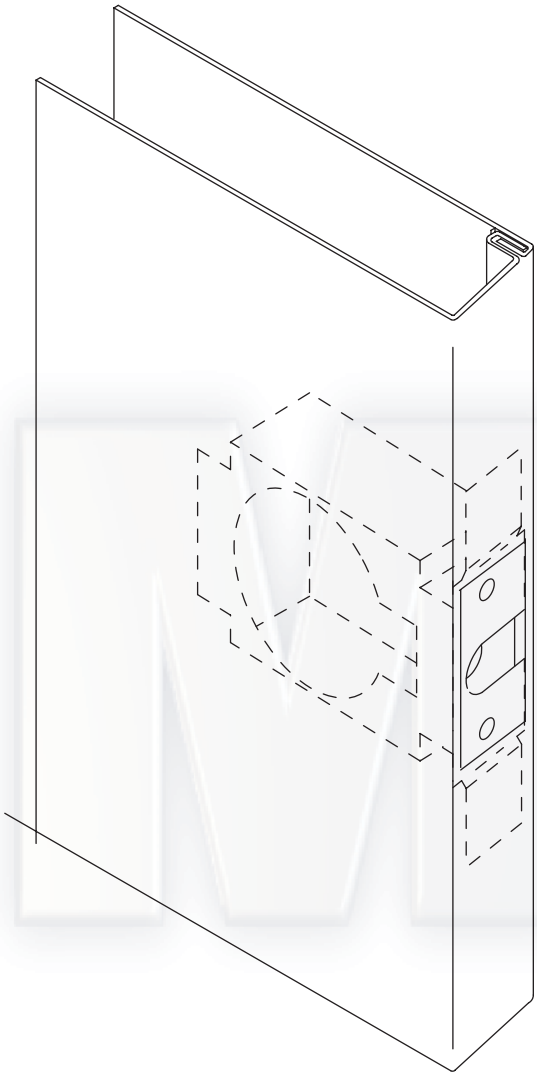
7 Gauge (0.167)

REINFORCEMENT IS PROJECTION WELDED TO DOOR WITH A MINIMUM OF SIX WELDS PER BRACKET PLUS AN ADDITIONAL TACK WELD AT EACH END, MIN. 1/4" LONG

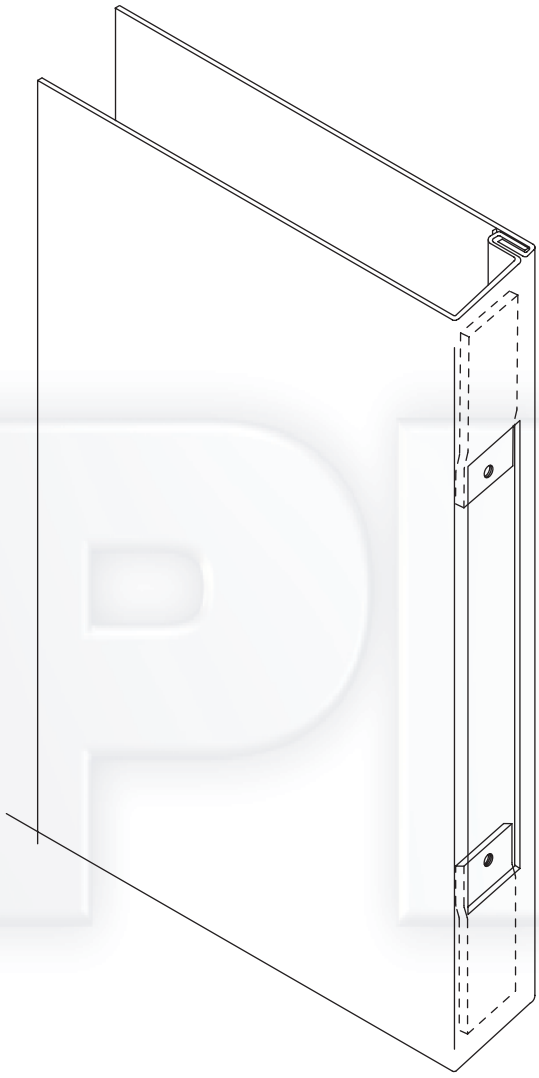
HEAVIER GAUGES AND FULL HEIGHT ALSO AVAILABLE

TDD 5

Door Hinge Reinf.



Cylindrical Lock
16 Gauge (0.053) Box Reinf.



Mortise Lock
11 Gauge (0.108) Tab Reinf.

Door Lock Reinf.

TDD 6

ALL DOORS RECEIVE UNDERWRITERS LABORATORIES LISTING MARK

DOOR DESCRIPTION	RATING			MAXIMUM DOOR OPENING SIZES	250^0 TEMP. RISE	SINGLE SWING	PAIR SWING	14 GAUGE	16 GAUGE	18 GAUGE	LATCH THROW	LOCKSET	FIRE EXIT HARDWARE				OPEN BACK STRIKE	FLUSH BOLTS	WITH ASTRAGAL	WITHOUT ASTRAGAL ($1^1/_2$ HR)
	3 HOUR CLASS A	$1^1/_2$ HOUR CLASS B & D	$^3/_4$ HOUR CLASS C & E										MORTISE	RIM	CONCEALED VERT. ROD	SURFACE VERT. ROD				
BASIC FIRE DOOR	*	*	*	4'0x8'0	*	*		*	*	*	$^1/_2$"	*	*	*						
	*	*	*	4'0x10'0	*	*		*	*	*	$^3/_4$"	*								
	*	*	*	8'0x10'0	*		*	*	*	*	$^3/_4$"		*	*	*	*	②			*
	*	*	*	8'0x8'0	*		*	*	*	*	$^3/_4$"	*	*	*				*	*	④
	*	*	*	8'0x10'0	*		*	*	*	*	$^3/_4$"							*	*	
DOUBLE EGRESS	*	*	*	8'0x10'0	*		*		*	*					*	*			*	*
STAINLESS STEEL	*	*	*	4'0x10'0	*	*		*	*	*	$^3/_4$"	*								
	*	*	*	8'0x10'0	*		*	*	*	*		*					②	*	*	
DUTCH DOOR	*	*	*	3'6x7'6		*		*	*	*	$^3/_4$"	*							*	
LOUVERED DOORS ①		*	*	4'0x10'0		*			*	*	$^1/_2$"	*								
		*	*	8'0x10'0			*		*	*	$^3/_4$"	*						*	*	*
LEAD-LINED DOORS	*	*	*	4'0x8'0		*			*	*	$^1/_2$"	*								
	*	*	*	8'0x7'2			*	*	*	*	$^3/_4$"	*						*	*	
	*	*	*	8'0x8'0			*		*	*	$^3/_4$"	*						*	*	
POSITIVE PRESSURE UBC 7-2 & UL 10C ③	*	*	*	4'0x10'0	*	*			*	*	$^1/_2$"	*	*	*						
	*	*	*	6'0x10'0	*		*		*	*	$^3/_4$"	*	*	*	*			*	*	
	*	*	*	8'0x10'0	*		*		*	*	$^3/_4$"	*	*	*	*	*		*	*	

Basic fire doors, double egress and stainless steel doors are available with prep for ceramic glazing as follows:

3 Hour "A" label- Max. exposed glass up to 100 in^2. (No dimension shall exceed 33")

$1^1/_2$ Hour "B" label- Half glass up to 36"x$56^1/_2$" or 2031 in^2 max.

1 Hour "B" label, $^3/_4$ Hour "C" label or 20 minute- Full glass up to 36"x89" or 3204 in^2 max.

2'-8" Min. width

Notes:

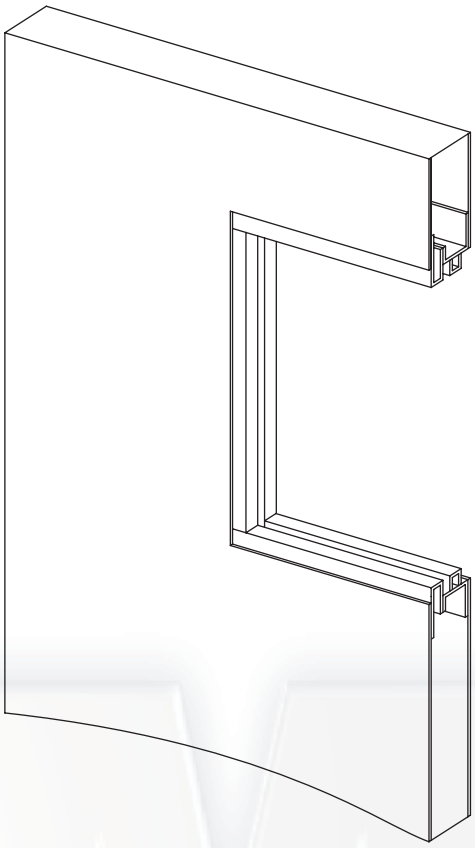
① Max. louver size 24"x24"

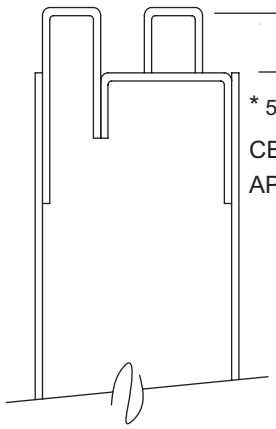
② Max. 8'0x7'2 $1^1/_2$ Hour with OBS

③ Includes Double Egress and Stainless Steel Doors

④ Up to 8'0x8'0 Polystyrene Pair 3 Hr-"A" Label

The intent of this chart is to provide general information only. All information subject to change, consult factory for latest information and specific data pertaining to individual job requirements.

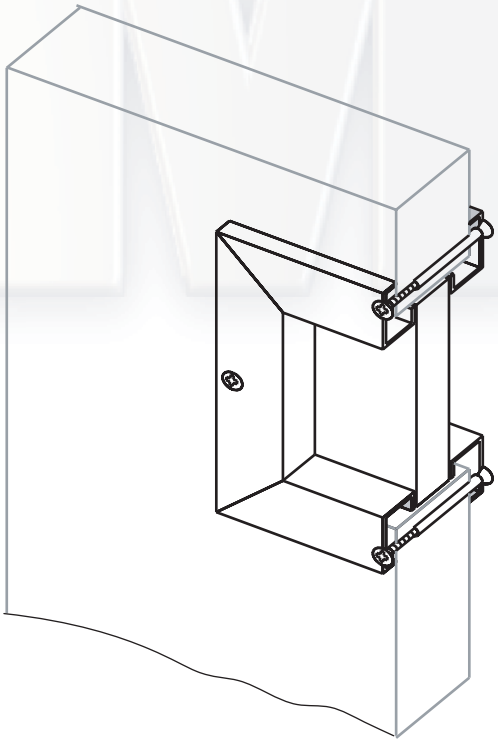


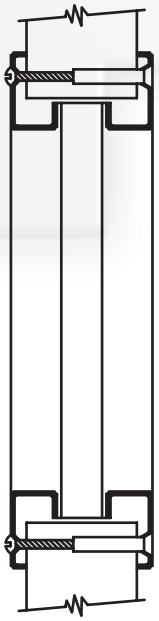


* 5/8" or 3/4" AT CERTAIN FIRE RATED APPLICATIONS

FOR GLAZING UP TO 1/2" THICK

CUSTOM SIZES AND TRIM DESIGNS FOR OTHER THICKNESSES ALSO AVAILABLE



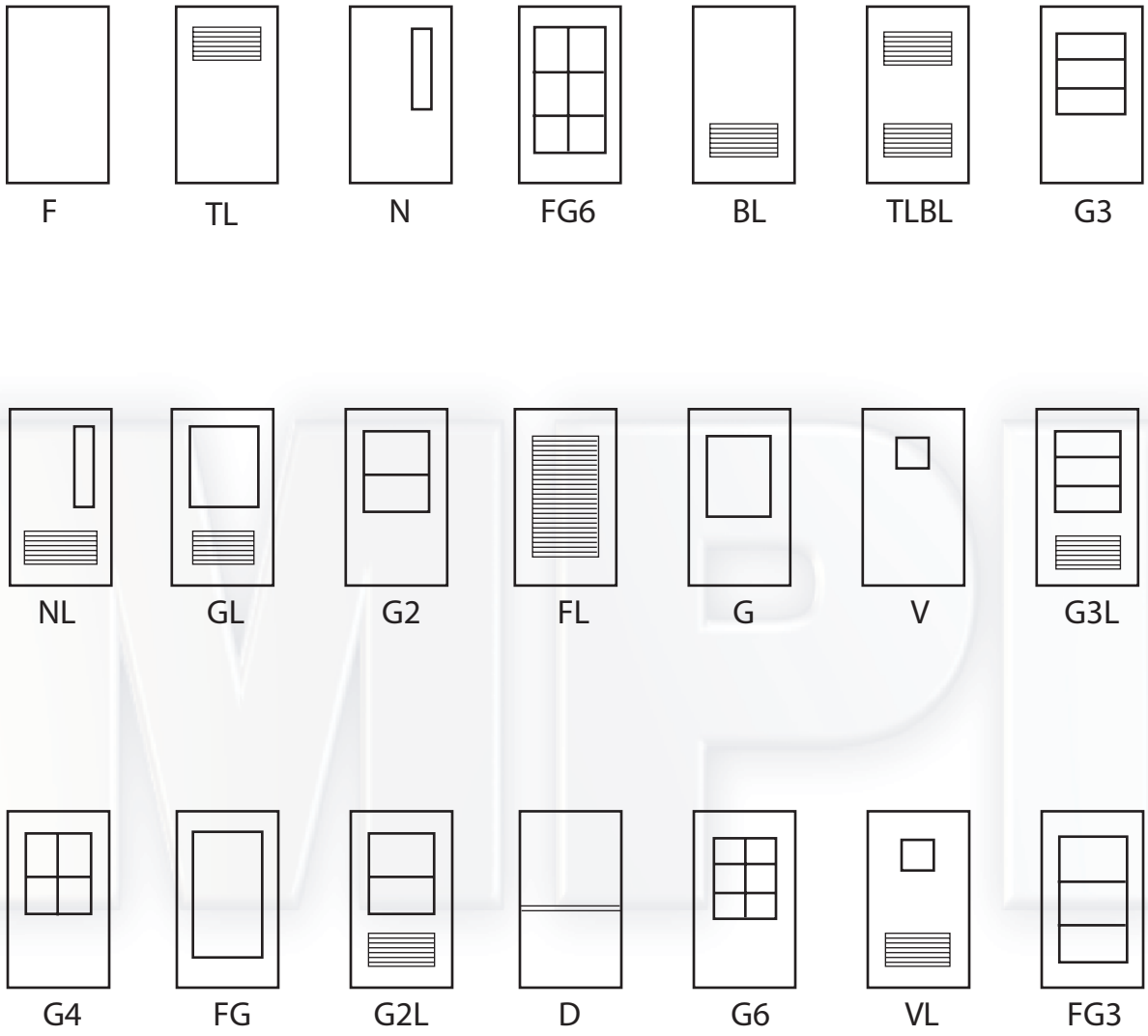


FOR FIRE-RATED DOORS WITH GLAZING EXCEEDING 1/2" THICK

CONTACT FACTORY FOR ADDITIONAL INFORMATION

TDD 8

Door Glazing Trim

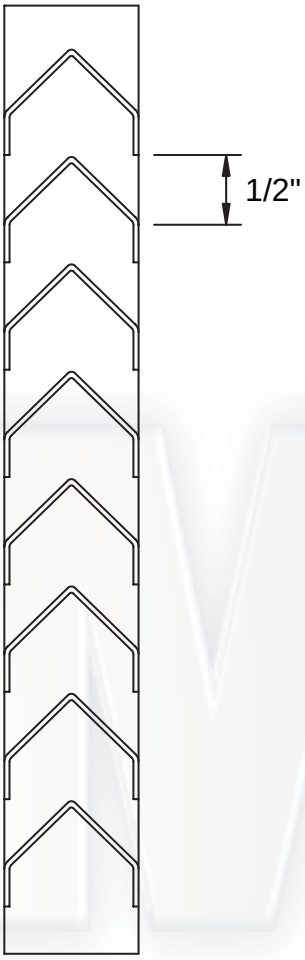


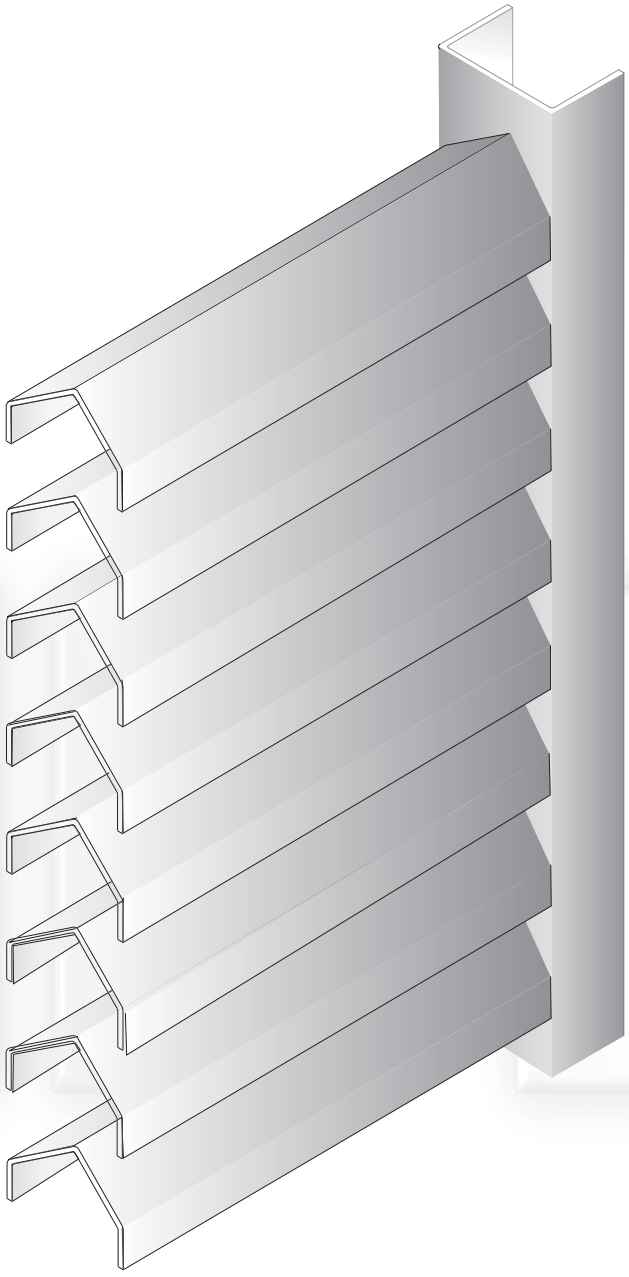
Vision lite and louver sizes as specified.

See MPI technical publications TDD 8 and TDD 10 for additional information.

TDD 9

Door Elevation Types





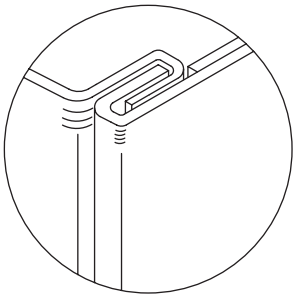
Standard Door Louver
Sight Proof
Louver gauge and material as specified
Blades tenoned to a 16 gauge channel surround
Louver assembly is welded to inside of door
No overlapping trim
30% -35% Free air flow

Door Louver

TDD 10

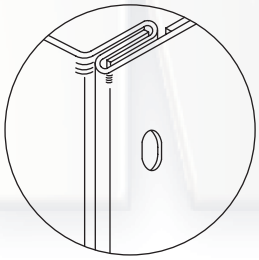
All reinforcement meets or exceeds the minimum requirements of Underwriters Laboratories, ANSI A250.6, ANSI A250.8 and HMMA 860/HMMA 861. This information is for reference only. Please contact the factory for hardware types not shown and for information pertaining to metric equivalents and gauge thickness.

HARDWARE ITEM	MIN. GAUGE
Mortise Locks & Deadbolts	**0.108**
Bored or Cylindrical Locks	**0.108/0.053**
Flush Bolts	**0.108**
Surface Bolts	**0.093**
Surface Closers	**0.067**
Surface Applied Holders/Stops	**0.067**
Pull Plates/Bars	**0.067**
Surface Applied Exit Devices	**0.067**
Pivots	**0.167**
Hinges ($1\frac{3}{8}$" Doors)	**0.167**
Hinges ($1\frac{3}{4}$" Doors)	**0.167**



DETAIL INTERLOCKING EDGE
(SQUARE OR BEVELED)

OPEN EDGE SEAM



PLUG WELD HOLE AND FINISH SMOOTH

WELDS LOCATED NEAR THE TOP AND BOTTOM OF DOOR AND ABOVE AND BELOW EACH HINGE OR LOCK CUTOUT

MAY ALSO HAVE ADDITIONAL WELDS BETWEEN CUTOUTS

APPLICABLE TO ALL DOOR CORE TYPES

SEAMLESS EDGE (STANDARD)

MAY BE TACK WELDED AND FINISHED SMOOTH OR CONTINUOUSLY SEAM WELDED AND FINISHED SMOOTH

APPLICABLE TO ALL DOOR CORE TYPES

Door Edge Construction

DOOR END CHANNEL (TOP AND BOTTOM)

PROJECTION WELDED TO BOTH FACES

MINIMUM 16 GA. (0.053) STANDARD

INVERT CHANNEL WHEN CLOSED TOP/BOTTOM REQUIRED

MAY BE SEALED WEATHER TIGHT

TDD 13

Door End Channels

ANSI A250.4 TESTING
TEST PROCEDURE AND ACCEPTANCE CRITERIA FOR STEEL DOORS AND FRAMES

A typical steel stiffened door was tested for MPI by Intertek Testing Services in conjunction with the HMMA division of NAAMM. The cyclical operation and comprehensive twist tests indicated in the specification provided the endurance portion of the test.
Four million cycles of opening and closing the door were performed thereby exceeding the minimum requirement of ANSI A250.8 level 3 and 4 doors by three million cycles.

ITS Test Report: WHI-495-SP-0631

MEMBER HMMA HOLLOW METAL MANUFACTURERS ASSOCIATION DIVISION OF NAAMM NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

Intertek

Physical Endurance Testing

TDD 14

ANSI A250.4 TESTING

TEST PROCEDURE AND ACCEPTANCE CRITERIA FOR STEEL DOORS AND FRAMES

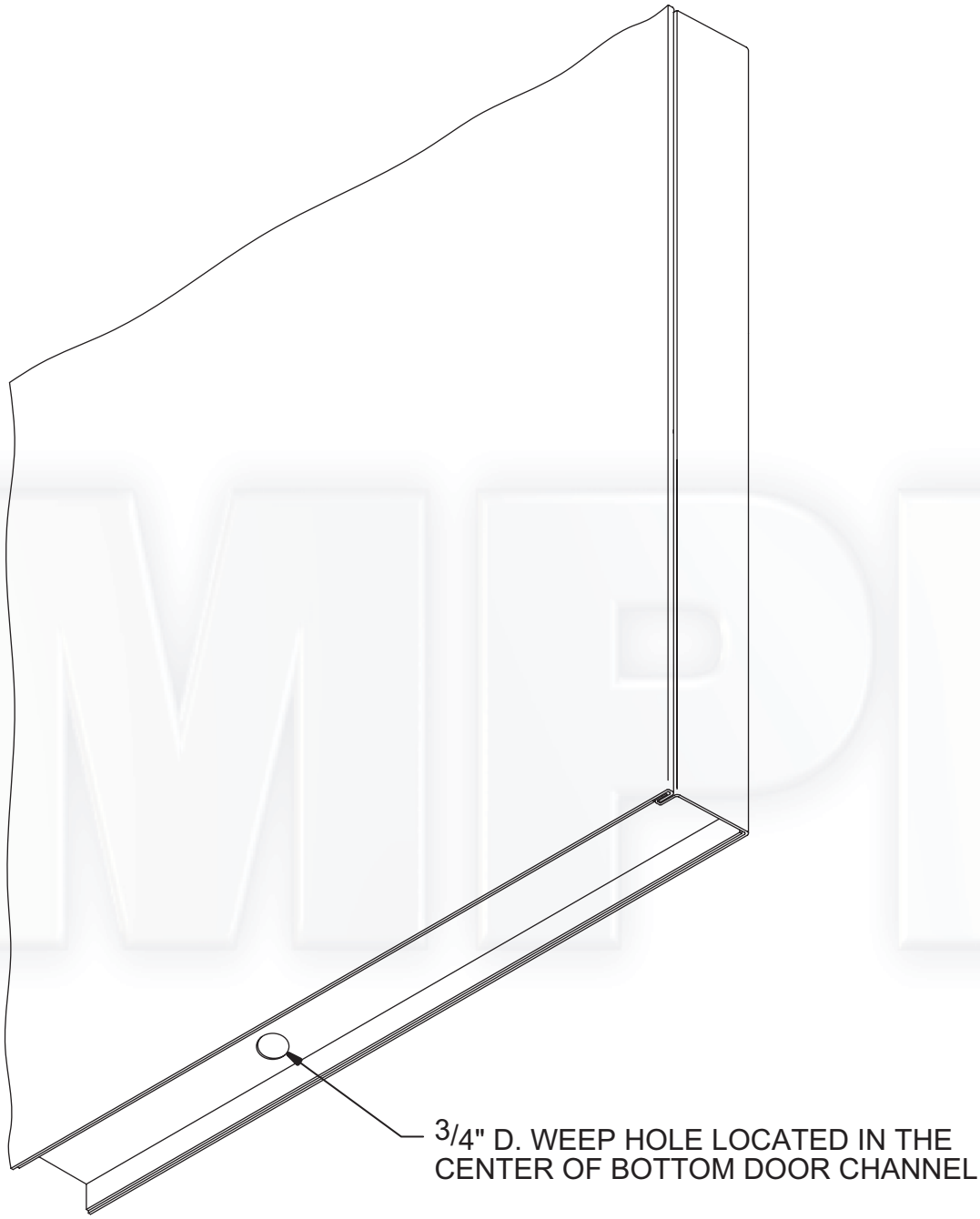
A typical polystyrene core door was tested for **MPI** by Intertek Testing Services. The cyclical operation and comprehensive twist tests indicated in the specification provided the endurance portion of the test.

One million cycles of opening and closing the door were performed in accordance with ANSI Standard A250.4. The test results indicate the **MPI** door exceeded the minimum requirements set forth by the standard for Level A doors and meet all criteria for acceptance.

ITS Test Report: 3195456MID-002

Physical Endurance Testing

TDD 114A



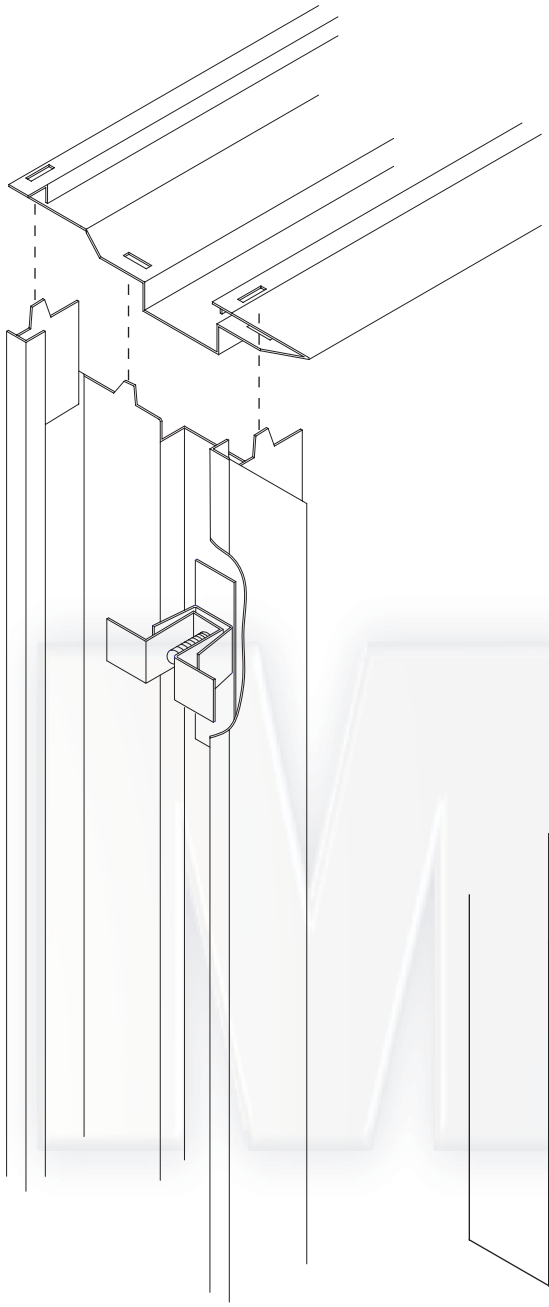
TDD 15

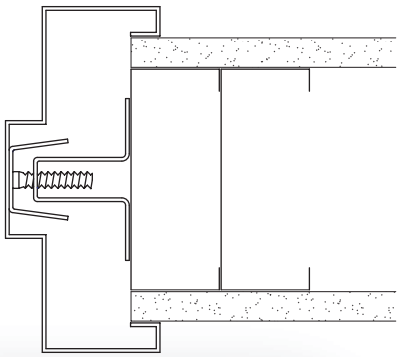
Weep Hole

HOLLOW METAL FRAMES

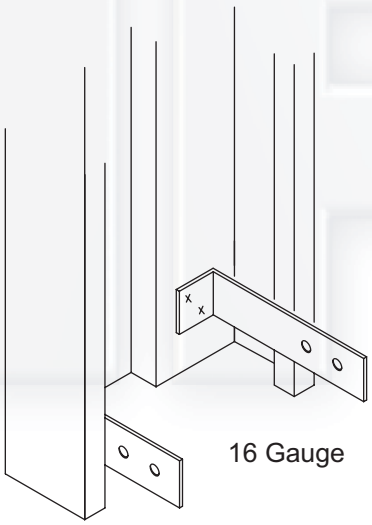
- MPI custom frames are manufactured to the highest industry standards with many features exceeding the minimum requirements set forth in those standards.
- Fabrication is in accordance with HMMA 860, HMMA 861 and ANSI-A250.8.
- Frames are available with standard face welded corners, full profile weld or knock down for field assembly.
- Frames are manufactured from cold-rolled steel, A60 galvanealled, G90 zinc coated or stainless steel.
- Fire ratings are available for most frame types up to and including 3 hour A-label in positive pressure in accordance with UBC 7-2 and UL 10C.
- MPI is constantly seeking ways to improve products. Changes in design and specifications are made from time to time in order to implement these improvements. MPI reserves the right to do so without notice and without obligation to incorporate such changes to any product previously manufactured.

TDF I



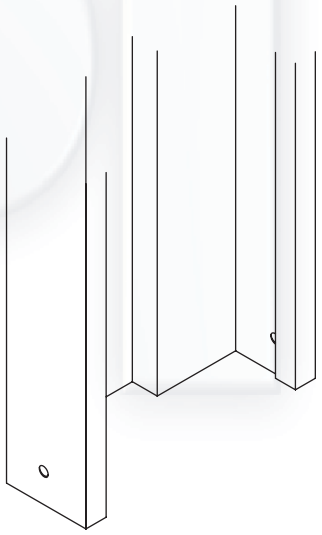


COMPRESSION ANCHOR



16 Gauge

STANDARD BASE ANCHOR

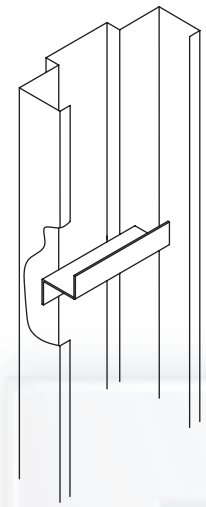


ALTERNATE HOLE AT BASE

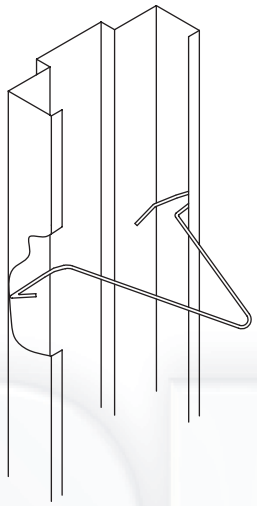
FRAME IS SIZED TO FIT EXISTING ROUGH OPENING. TYPICALLY, A NEW ROUGH OPENING SHOULD BE 1" TO $1^{1}/_{4}$" WIDER ON EACH SIDE THAN THE ACTUAL DOOR OPENING WIDTH AND 1" TO $1^{1}/_{2}$" TALLER THAN THE DOOR OPENING HEIGHT. AVAILABLE AS FIRE-RATED UP TO $1^{1}/_{2}$ HOUR. SEE MPI TECHNICAL PUBLICATIONS TDF 7 AND TDF 16 FOR ADDITIONAL INFORMATION.

KD Drywall Frame

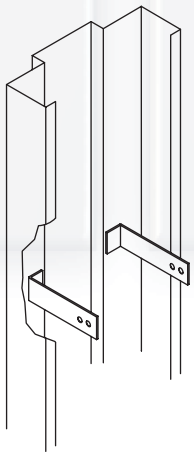
TDF-1



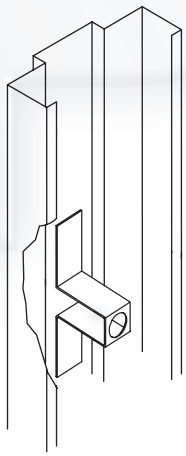
METAL STUD ANCHOR
(MSA)



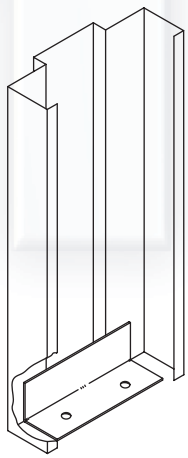
MASONRY WIRE ANCHOR
(MWA)



WOOD STUD ANCHOR
(WSA)



EXISTING WALL ANCHOR
(EMA)

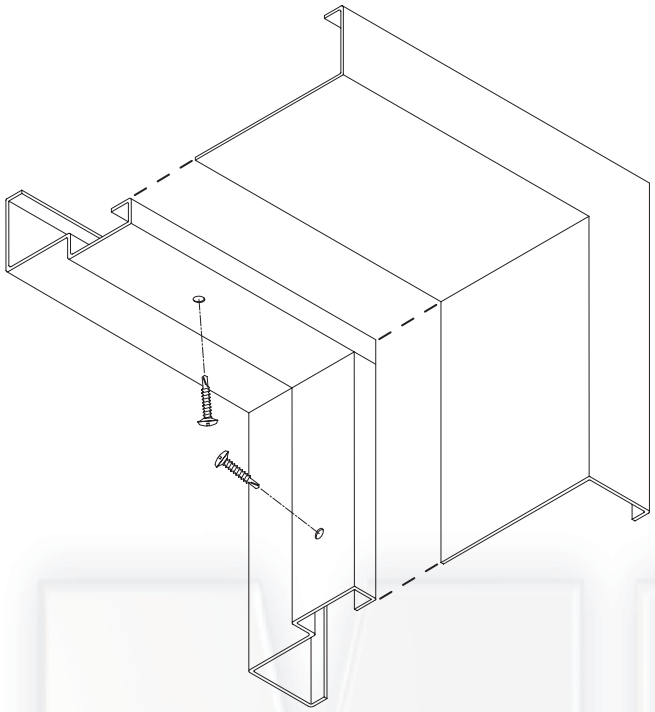


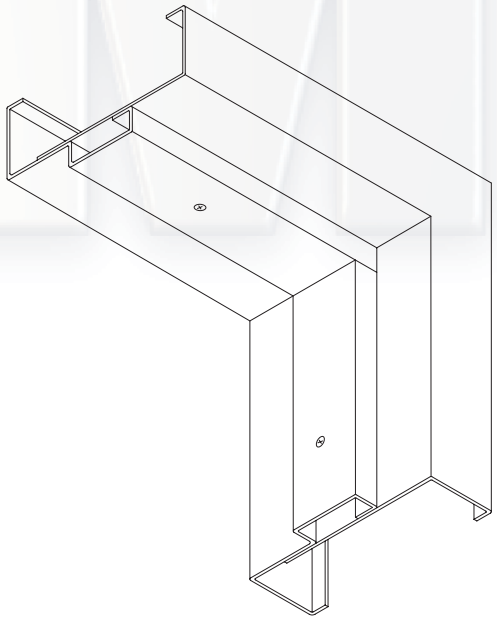
WELDED FLOOR CLIP
(WFC)

FOR FIELD ASSEMBLY, INTERNAL AND EXTERNAL ALIGNMENT TABS ARE BENT OVER. FRAME IS SQUARED AND PLUMBED IN THE OPENING PRIOR TO ATTACHING TO STUDS OR WALL. SEE MPI TECHNICAL PUBLICATIONS TDF 15, TDF 17, TDF 18 and TDF 19 FOR ADDITIONAL INFORMATION.

TDF IA

Knock Down Frame





INSTALLS IN EXISTING WALL OPENING

MINIMUM 16 GAUGE (0.053)

FRAME CORNERS ARE FULLY WELDED

NO ANCHORS ARE REQUIRED

AVAILABLE AS A DOOR FRAME OR AS FOUR-SIDED WINDOW FRAME

FIRE-RATED DOOR FRAMES AVAILABLE SEE MPI TECHNICAL PUBLICATION TDF 7 FOR ADDITIONAL INFORMATION

Two-piece Split Frame

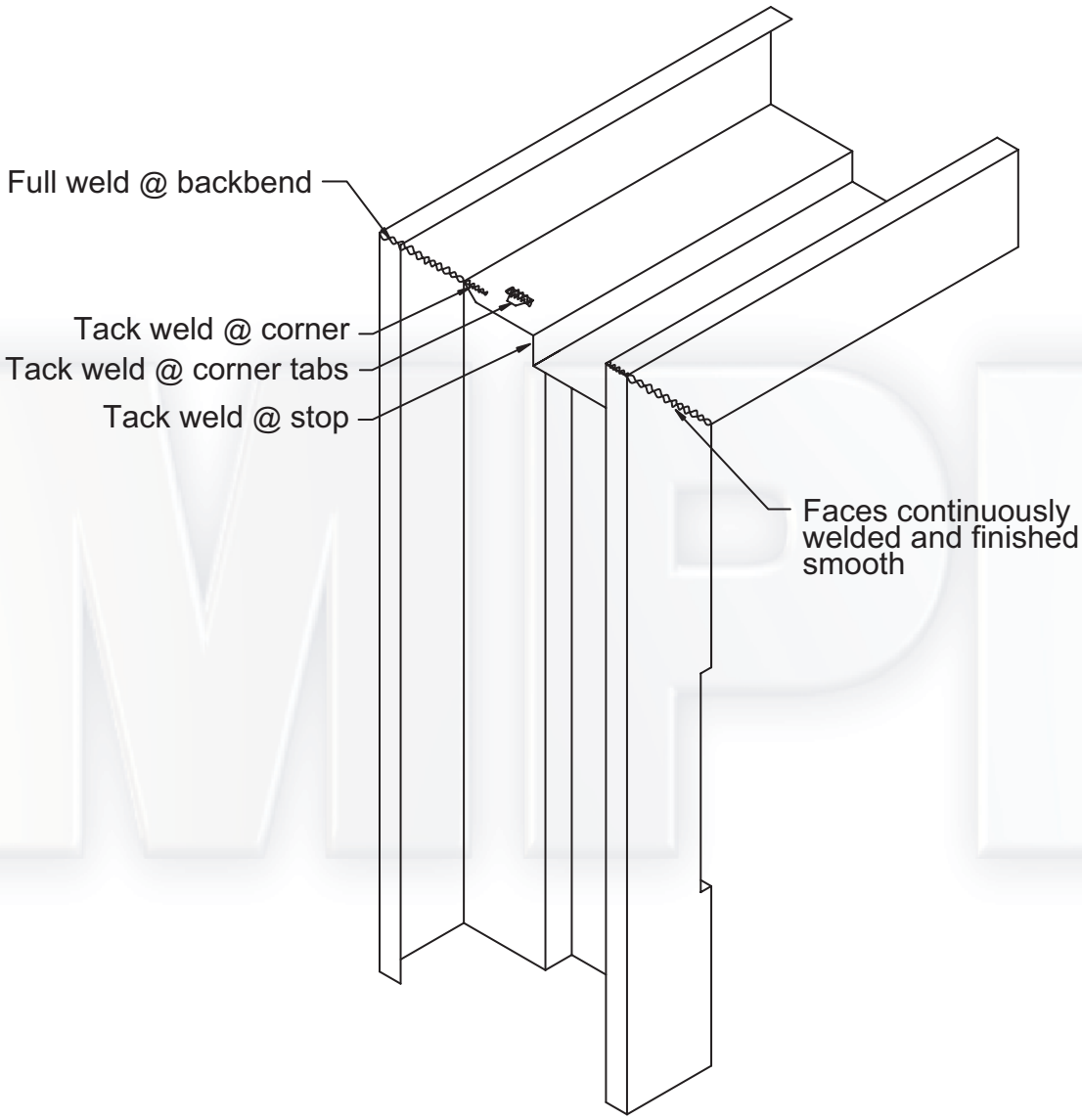
TDF 2

The double egress profile allows a pair of doors, that have the same handing, to swing in opposite directions out of the opening. In order for doors to align properly in the closed position, they must hang in the exact center of the frame jamb depth.

Double egress frames are available for any wall type and can be fire-rated up to three hours. See MPI technical publication TDF 7 for additional information.

TDF 3

Double Egress Frame

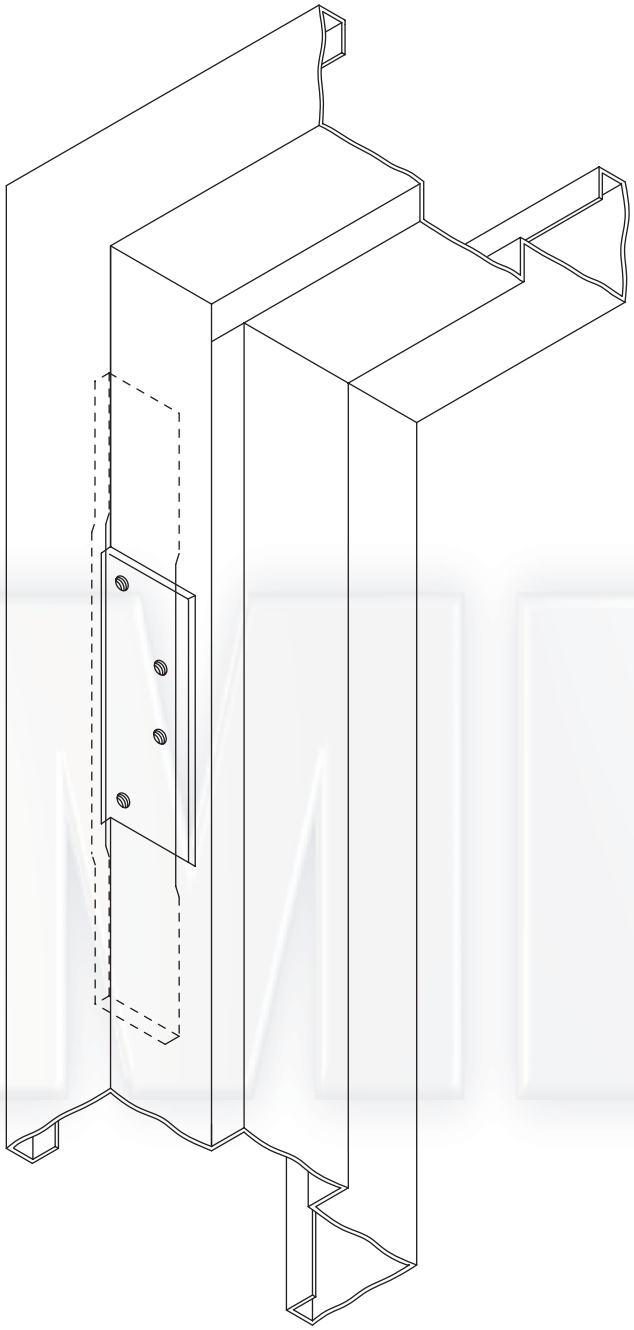


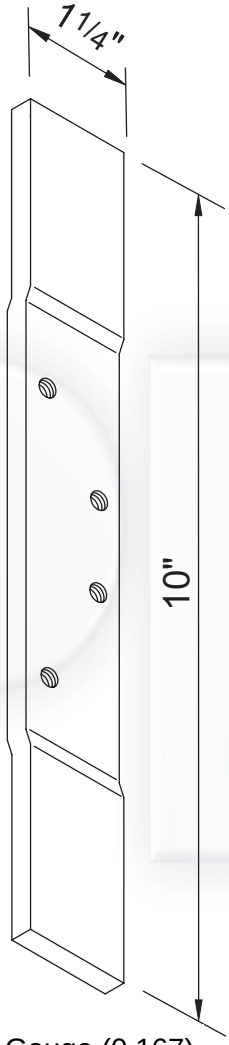
FULL PROFILE WELD ALSO AVAILABLE.

FRAMES CAN BE MANUFACTURED WITH FULL SAW-CUT MITERED CORNERS.

TDF 4

Standard Factory Corner Weld





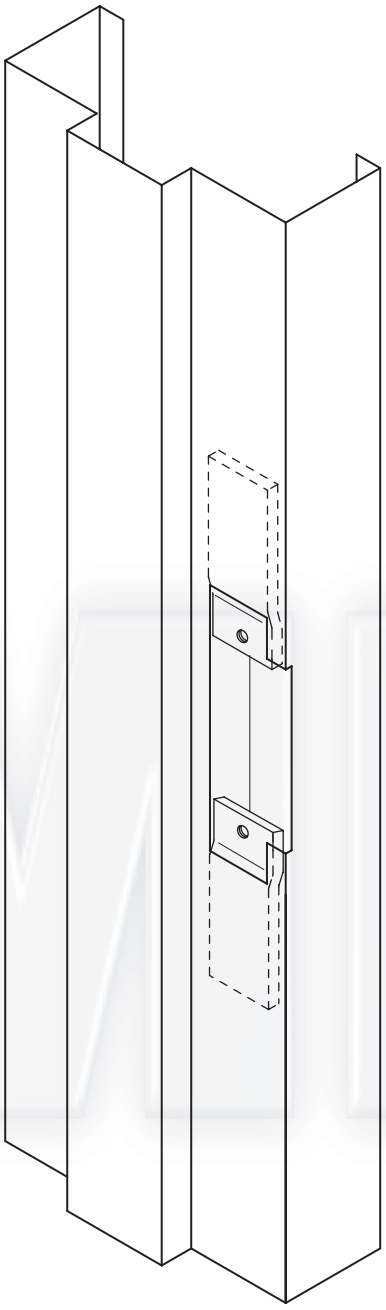
7 Gauge (0.167)

REINFORCEMENT IS PROJECTION WELDED TO FRAME WITH A MINIMUM OF SIX WELDS PER BRACKET

HEAVIER GAUGES, FULL WIDTH, FULL HEIGHT AND FULL WIDTH/FULL HEIGHT ALSO AVAILABLE

TDF 5

Frame Hinge Reinforcement



11 Gauge

REINFORCEMENT TABS ARE PROJECTION WELDED TO FRAME WITH A MINIMUM OF THREE WELDS PER TAB

HEAVIER GAUGES AVAILABLE

TDF 6

Frame Strike Reinforcement

ALL FRAMES RECEIVE UNDERWRITERS LABORATORIES LISTING MARK

FRAME DESCRIPTION	RATING			MAXIMUM DOOR OPENING SIZES	SINGLE SWING	PAIR SWING	12 GAUGE (0.093)	14 GAUGE (0.067)	16 GAUGE (0.053)	WALL					HOSPITAL STOP	STAINLESS STEEL	MAXIMUM DOOR OR GLASS OPENING SIZE	MAXIMUM TRANSOM OPENING SIZE
	3 HOUR CLASS A	1 1/2 HOUR CLASS B & D	3/4 HOUR CLASS C & E							NEW MASONRY	EXISTING MASONRY	PRE-SET STUD	METAL STUD	WOOD STUD				
THREE SIDED FRAMES ①	*	*	*	4'0x10'0	*		*	*	*	*	*	*	*	*	*	*		
	*	*	*	8'0x10'0		*	*	*	*	*	*	*	*	*	*	*		
DOUBLE EGRESS FRAMES	*	*	*	8'0x10'0		*	*	*	*	*	*		*	*		*		
TRANSOM FRAME WITH BAR 1 3/4" PANEL	*	*	*	3'6x11'0	*		*	*	*	*	*		*	*	*		3'6x7'2	3'6x7'2
	*	*	*	7'0x10'0		*	*	*	*	*	*		*	*	*		3'6x7'2	7'0x3'0
TRANSOM FRAME WITH BAR SANDWICH PANEL	*	*	*	4'0x10'0	*		*	*	*	*	*		*	*	*		4'0x10'0	4'0x2'8
	*	*	*	8'0x11'2		*	*	*	*	*	*		*	*	*		8'0x10'0	8'0x2'8
TRANSOM FRAME NO BAR 1 3/4" PANEL	*	*	*	4'0x11'4	*		*	*	*	*	*		*	*	*		4'0x9'0	4'0x4'6
	*	*	*	8'0x11'2		*	*	*	*	*	*		*	*	*		8'0x8'0	7'0x4'0
MULTI-SWING DOOR FRAME		*	*	12'0x8'0	*	*	*	*	*	*	*				*		8'0x8'0	
THREE SIDED TWO PIECE FRAME		*	*	4'0x10'0	*			*	*				*					
THREE SIDED FRAME POSITIVE PRESSURE UBC 7-2 & UL 10C ②		*	*	4'0x10'0	*		*	*	*	*	*		*	*	*	*		
		*	*	8'0x10'0		*	*	*	*	*	*		*	*	*	*		

Refer to MPI technical publication TDF 8, Fire Rated Frames With Glass, for additional information.

Notes:

① KDPF 4'0x8'0 max. for single door openings and 8'0x8'0 max. for double door openings
Max 1 1/2 hour rating
KDPF not available in stainless steel

② Includes double egress frames

The intent of this chart is to provide general information only. All information subject to change, consult factory for latest information and specific data pertaining to individual job requirements.

ALL FRAMES RECEIVE UNDERWRITERS LABORATORIES LISTING MARK

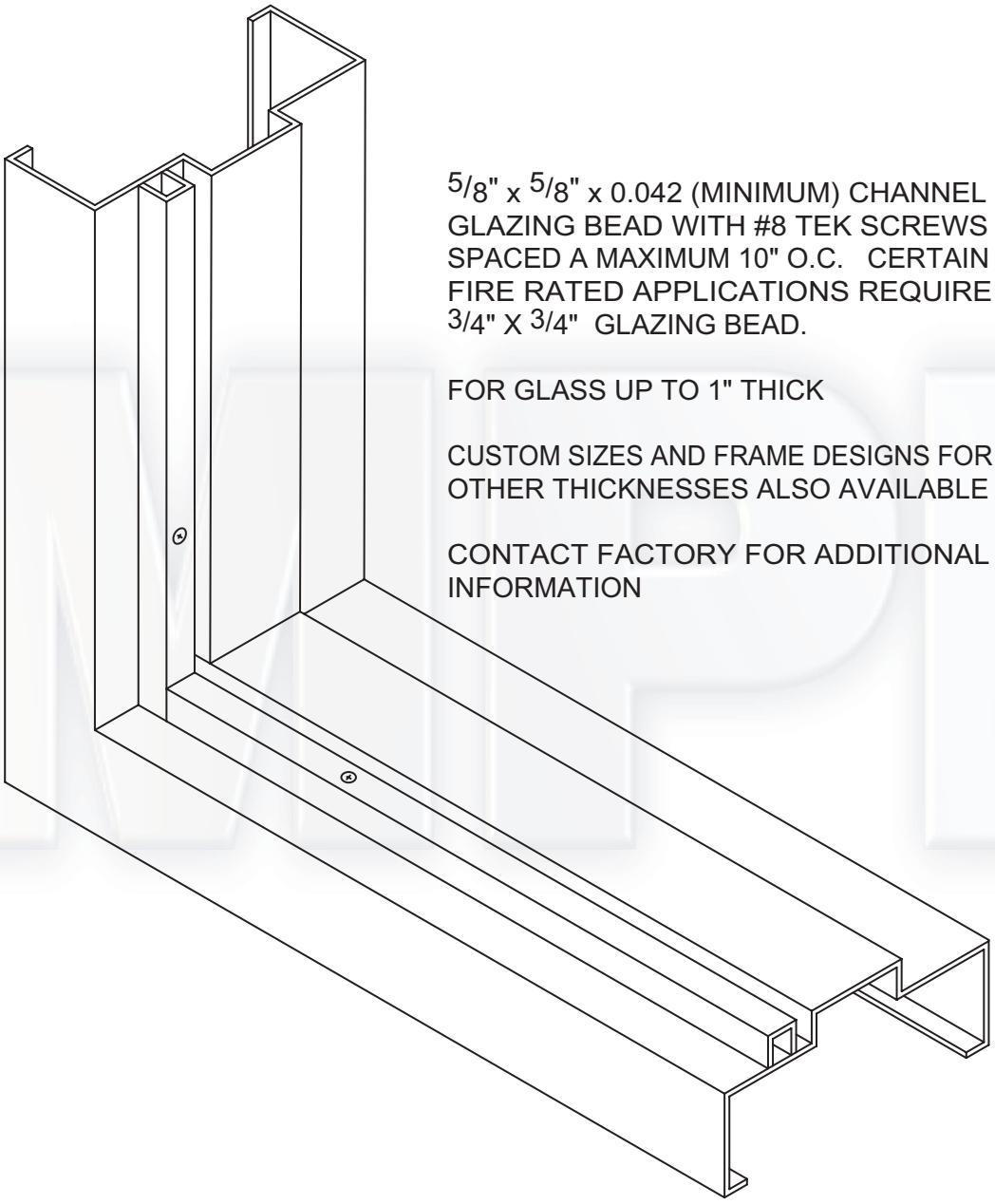
FIRE RATED FRAMES WITH GLASS

RATING	FRAME TYPE	MAX O/A SIZE- ANY ANCHOR W	MAX O/A SIZE- ANY ANCHOR H	MAX O/A SIZE- MAS ANCHOR W	MAX O/A SIZE- MAS ANCHOR H	MAX GLASS DIM W	MAX GLASS DIM H	in.²
20 minute*	Sidelight with ¼" glazing	13'-6"	12'-0"	13'-6"	12'-0"	101½"	101½"	3831**
20 minute*	Window with ¼" glazing	13'-6"	12'-0"	13'-6"	12'-0"	109¾"	109¾"	5286
¾ hr- "C"	Sidelight with ¼" glazing	12'-10"	11'-4"	13'-6"	12'-0"	54"	54"	1296
¾ hr- "C"	Window with ¼" glazing	8'-0"	10'-0"	12'-0"	11'-4"	33"	48"	1296
1 hr- "B"	Sidelight with specialty glazing	10'-2"	10'-1"	10'-2"	10'-1"	54"	77¾"	2721***
1 hr- "B"	Window with specialty glazing	8'-0"	10'-0"	12'-0"	11'-4"	95"	95"	3325***
1½ hr- "B"	Sidelight with specialty glazing	10'-2"	10'-1"	10'-2"	10'-1"	46½"	56½"	2627***
1½ hr- "B"	Window with specialty glazing	8'-0"	10'-0"	12'-0"	11'-4"	46½"	56½"	2627***

SPECIALTY GLAZING IS ANY UL LISTED GLAZING MATERIAL- See individual manufacturer data for glazing limitations

* 20 minute without hose stream
** Alternate 48"x109¾" (5268 in.²)
***Varies by glazing manufacturer

Total area of exposed glass per glass opening cannot exceed the in.² shown.
All anchors must be MPI standard UL approved types.
Sloped head permitted at 20 minute rated frames. (Max overall size 13'-2" x 11'-7")
Segmented radius permitted at 20 minute sidelight frames.
Minimum ¾" stop height at ¾ hr- "C" window frames with more than 500 in.² exposed glass.
Double glazing permitted at ¾ hr- "C" frames- ¼" rated glass one rabbet and ¼" non-rated one rabbet.
Segmented radius frames and multi-angled corner frames are available with rating up to ¾ hr- "C" label.
Consult factory for additional information and other limitations.
All glazing material by others. Glazing bead by MPI.
See MPI technical publication TDF 7, Fire Rated Door Frames, for additional information.



$^{5}/_{8}$" x $^{5}/_{8}$" x 0.042 (MINIMUM) CHANNEL GLAZING BEAD WITH #8 TEK SCREWS SPACED A MAXIMUM 10" O.C. CERTAIN FIRE RATED APPLICATIONS REQUIRE $^{3}/_{4}$" X $^{3}/_{4}$" GLAZING BEAD.

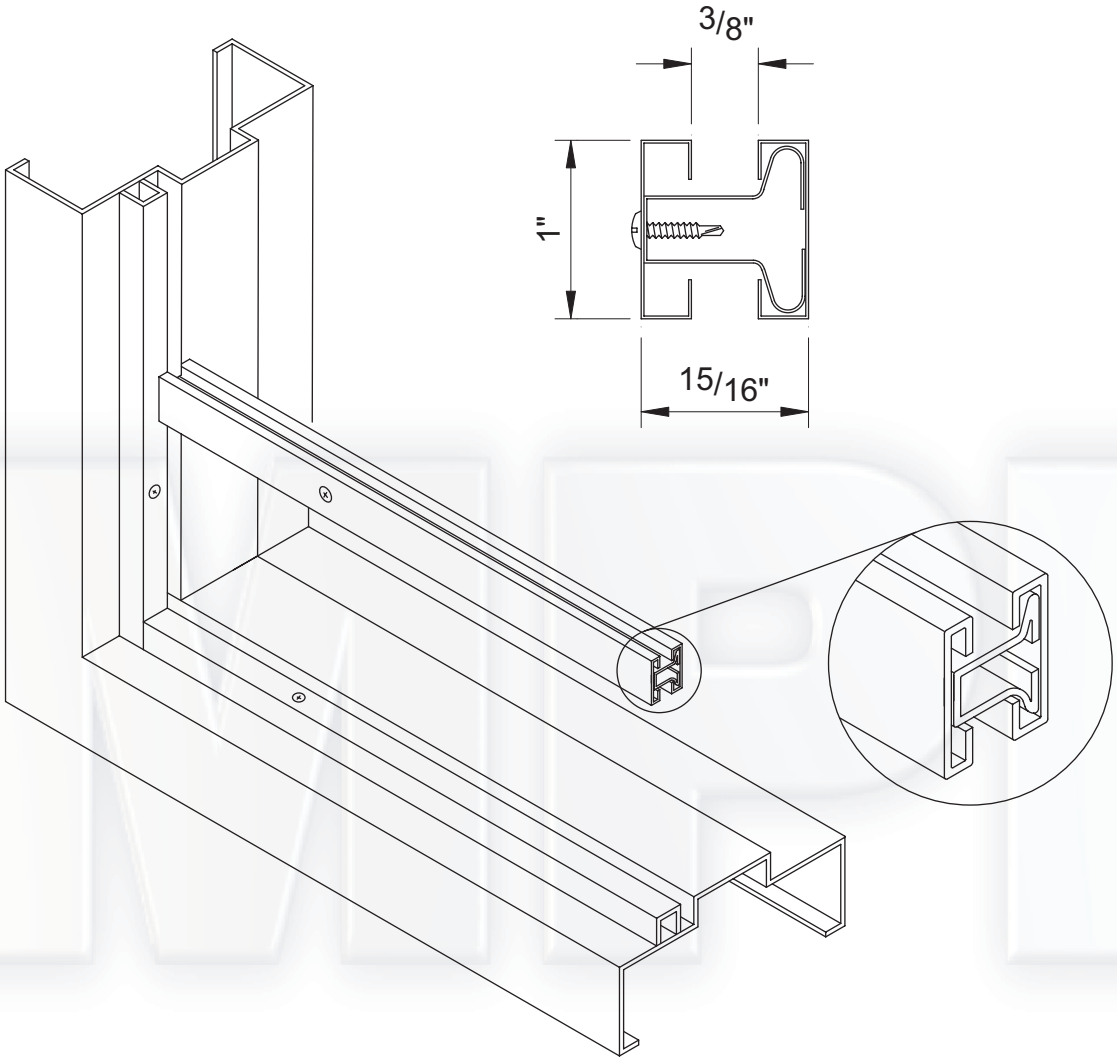
FOR GLASS UP TO 1" THICK

CUSTOM SIZES AND FRAME DESIGNS FOR OTHER THICKNESSES ALSO AVAILABLE

CONTACT FACTORY FOR ADDITIONAL INFORMATION

TDF 9

Frame Glazing Bead



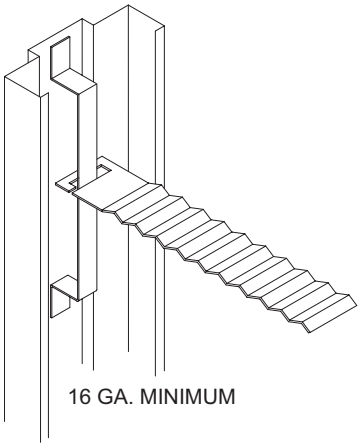
MUNTIN DESIGNED FOR GLAZING MATERIAL UP TO 1/4"
CUSTOM MUNTINS AVAILABLE FOR THICKER GLAZING
CONTACT FACTORY FOR ADDITIONAL INFORMATION

TDF 10

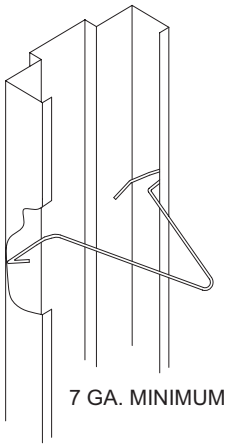
Frame Muntin

All reinforcement meets or exceeds the minimum requirements of Underwriters Laboratories, ANSI A250.6, ANSI A250.8 and HMMA 860/HMMA 861. This information is for reference only. Please contact the factory for hardware types not shown and for information pertaining to metric equivalents and gauge thickness.

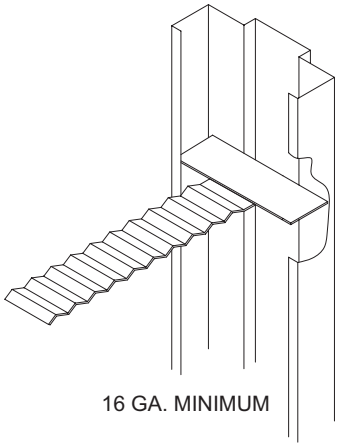
HARDWARE ITEM	MIN. GAUGE
Mortise Locks & Deadbolts	**0.108**
Bored or Cylindrical Locks	**0.108**
Flush Bolts	**0.108**
Surface Bolts	**0.108**
Surface Closers	**0.093**
Surface Applied Holders/Stops	**0.093**
Concealed Holders/Stops	**0.093**
Surface Applied Exit Devices	**0.093**
Pivots	**0.167**
Hinges	**0.167**



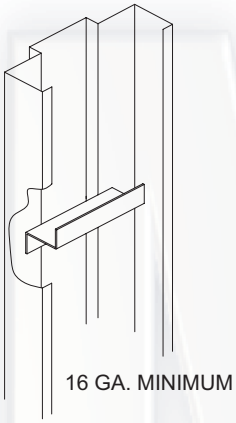
MASONRY ANCHOR
(MAS)



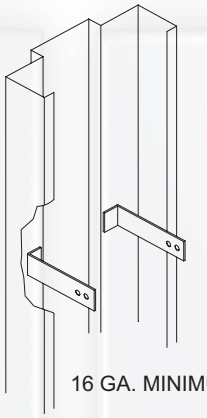
MASONRY WIRE ANCHOR
(MWA)



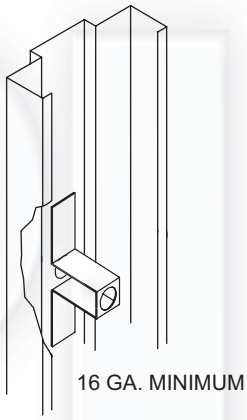
MASONRY T-ANCHOR
(MTA)



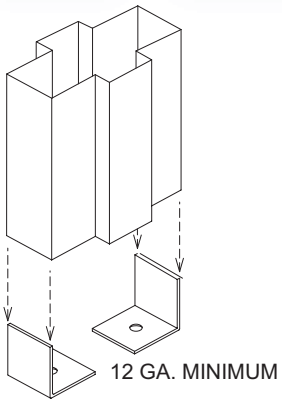
METAL STUD ANCHOR
(MSA)



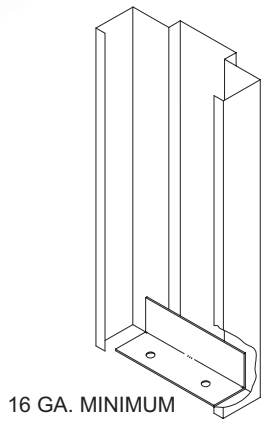
WOOD STUD ANCHOR
(WSA)



EXISTING WALL ANCHOR
(EMA)



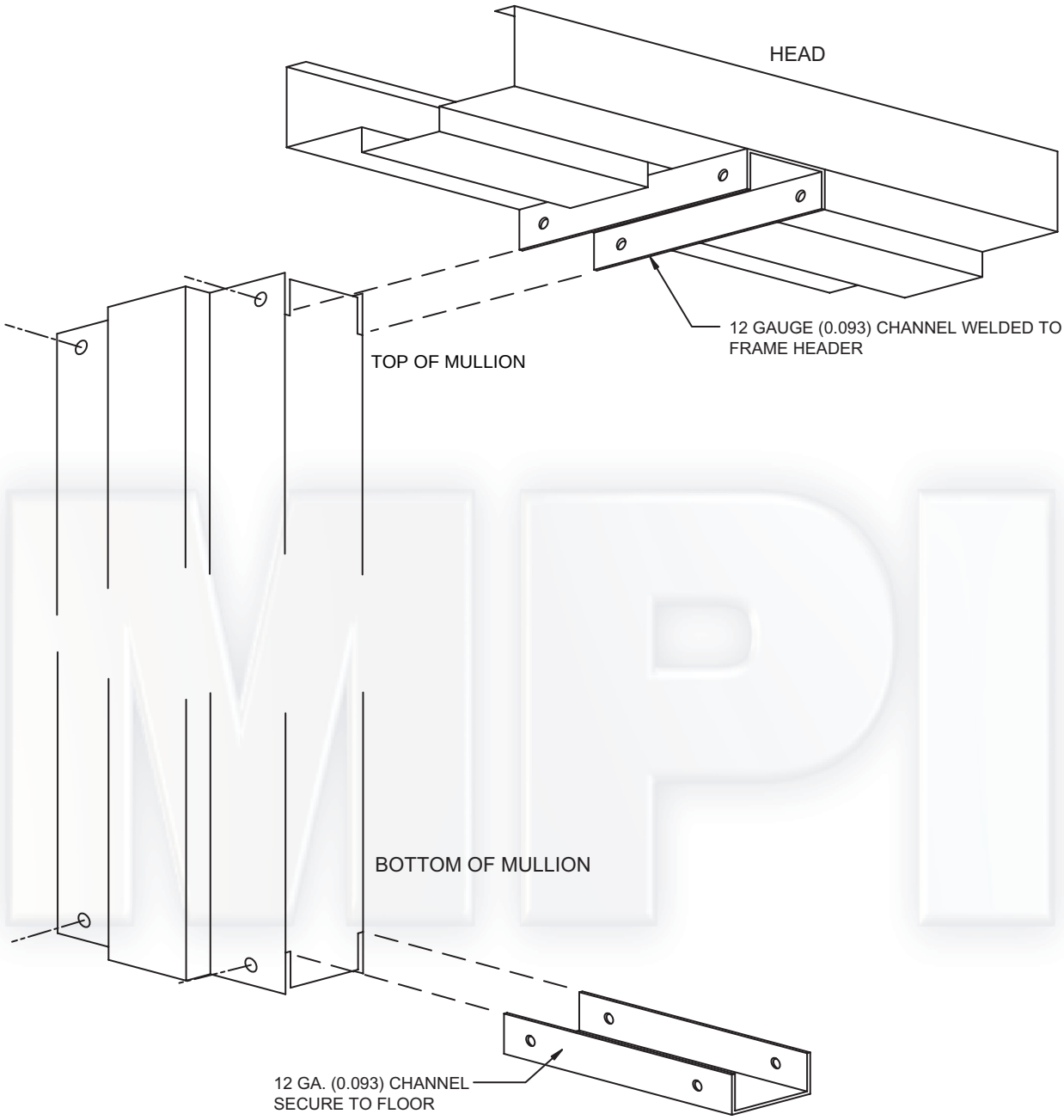
MULL BASE ANCHOR
(MBA)



WELDED FLOOR CLIP
(WFC)

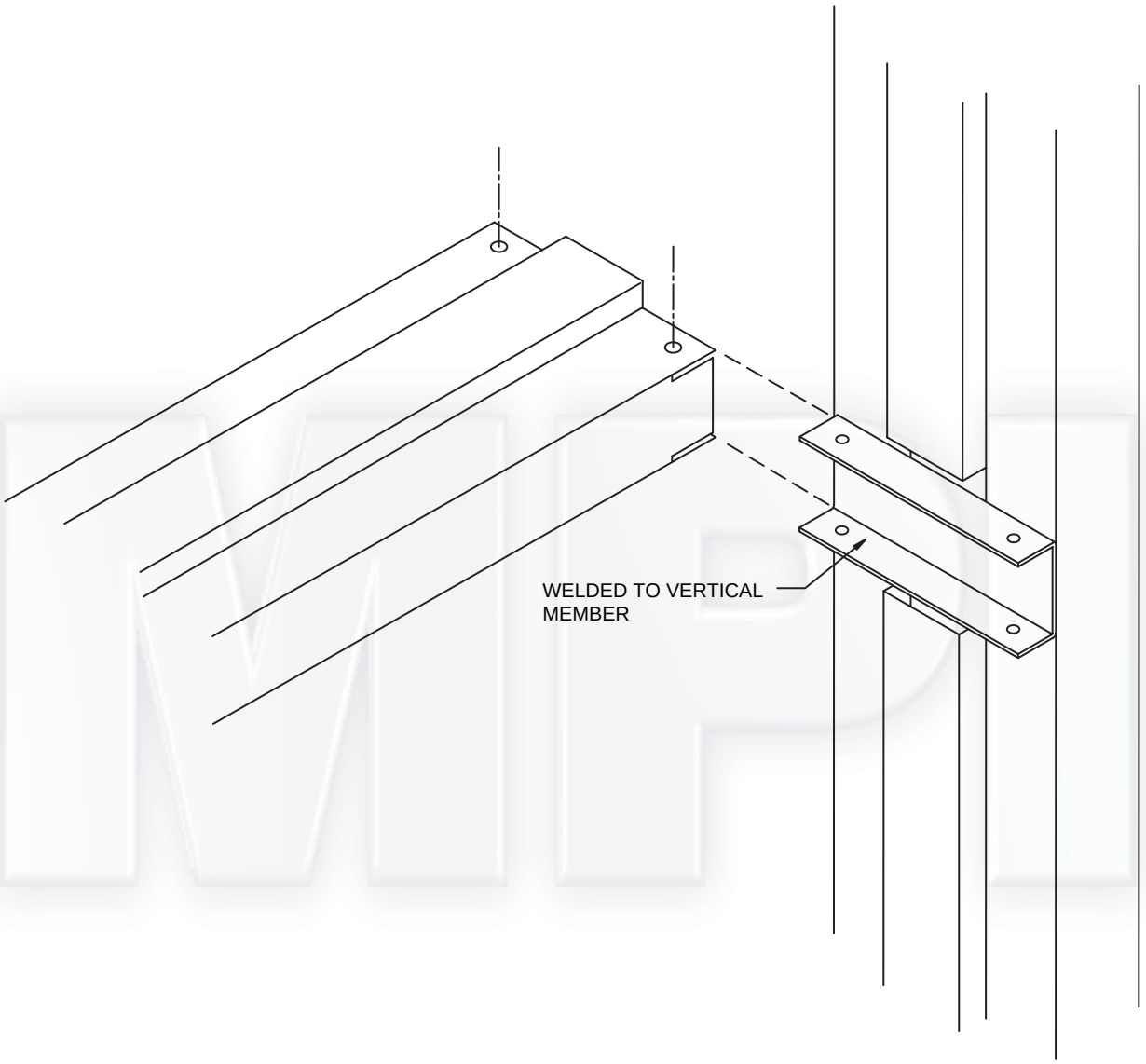
TDF 12

Frame Anchors



Removable Hollow Metal Mullion

TDF 13



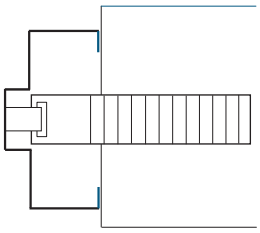
TDF-1

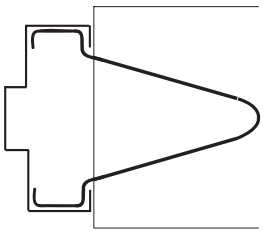
Removable Hollow Metal Transom Bar

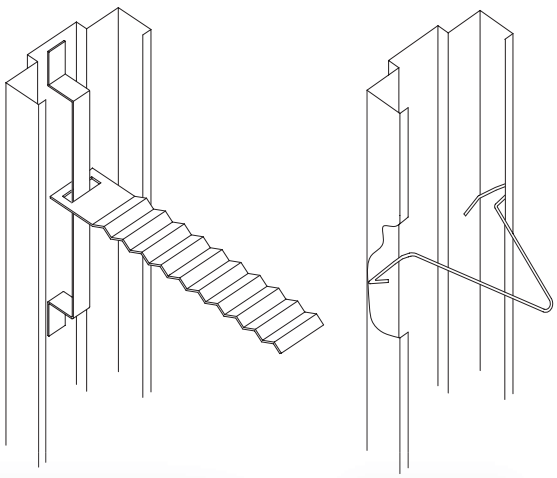
WELDED STEEL FRAME INSTALLATION DETAILS FOR MASONRY WALLS

Frames for masonry walls are provided with either wire anchors or strap anchors and attached floor anchors.

Anchors are spaced no more than 30" apart with the first anchor being located approximately12" from the bottom of the frame.

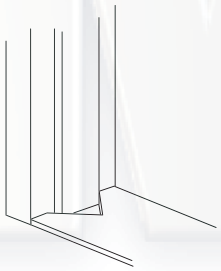






1) Place frame where opening is to be created and place a wood spreader cut to exact opening width at floor level.
2) Fasten base anchor to the floor with type of fastener suitable to floor. Support and brace frame as required.
3) Level the head.
4) Plumb the jambs and square the corners.
5) Place a horizontal wood spreader with a bottom support at the midpoint of the opening.

1



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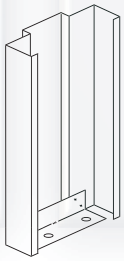

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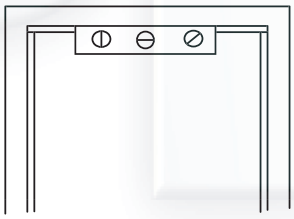

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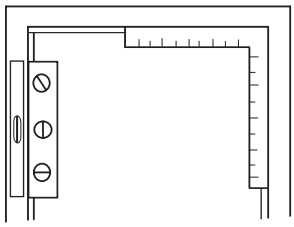

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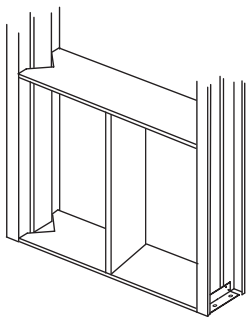


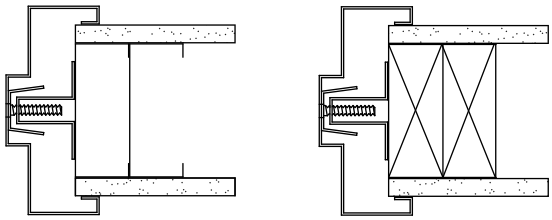
TDF 15

Frame Installation- Masonry Wall

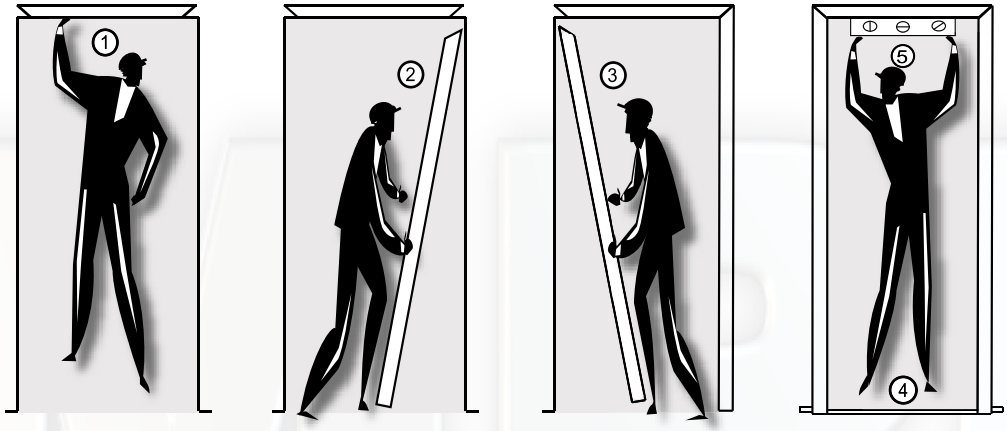
PRESSURE-FIT FRAME INSTALLATION DETAILS

Pressure-fit frames are designed for installation in existing prepared openings and are to fit tightly around the wall with minimal frame throat to wall clearance.

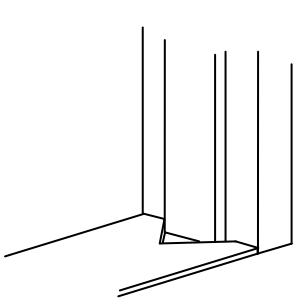
A new rough opening should be 1" to $1\frac{1}{4}$" wider on each side than the actual door width and 1" to $1\frac{1}{2}$" taller than the door opening height.



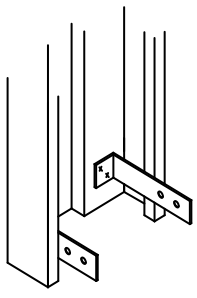
Pressure-fit frames are provided with compression anchors which are located near the top of each jamb.



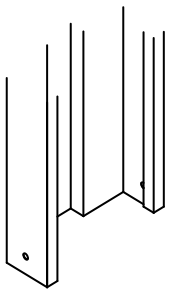
1) Place head in opening and push upward as far as possible.
2) Install either jamb and engage jamb clips in corresponding slots in head.
3) Install second jamb in same manner and position in opening.
4) Place a wood spreader (cut to exact opening width) at floor level.
5) Level the head and attach base anchors.
   Note: Notch drywall as required at base to accommodate anchors.
6) Adjust compression anchors to plumb frame in the opening.



WOOD SPREADER



BASE ANCHORS

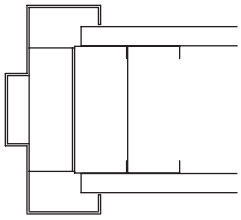


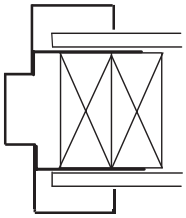
OPTIONAL PUNCHED HOLE IN LIEU OF ANCHOR

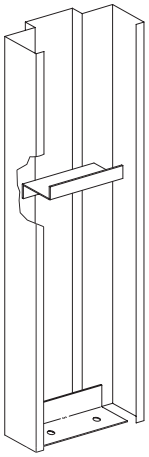
WELDED STEEL FRAME INSTALLATION DETAILS FOR WOOD OR METAL STUD WALLS

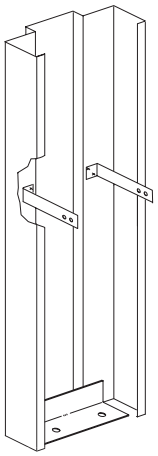
Frames for stud walls are provided with either wood stud anchors or metal stud anchors and attached floor anchors.

Anchors are spaced no more than 30" apart with the first anchor being located approximately16" from the bottom of the frame.



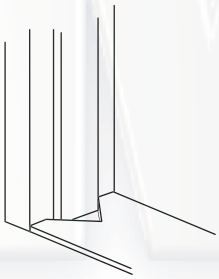






1) Place frame where opening is to be created and place a wood spreader cut to the exact opening width at floor level.
2) Fasten base anchor to floor with type of fastener suitable to floor.
3) Level the head.
4) Plumb the jambs and square the corners.
5) Place a horizontal wood spreader with a bottom support at the midpoint of the opening.

1



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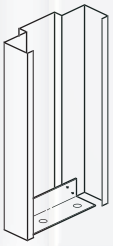

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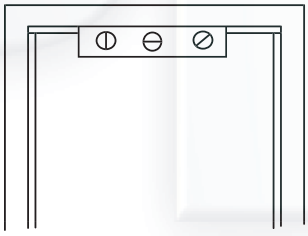

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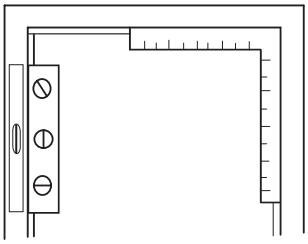

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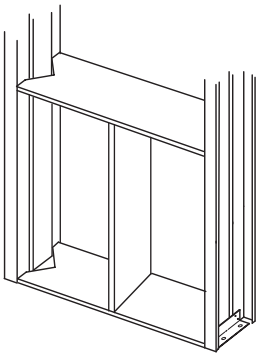
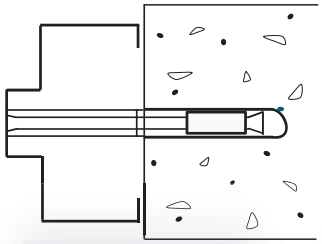
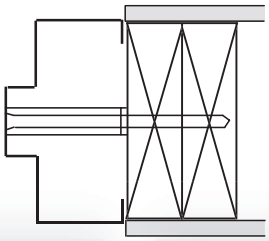


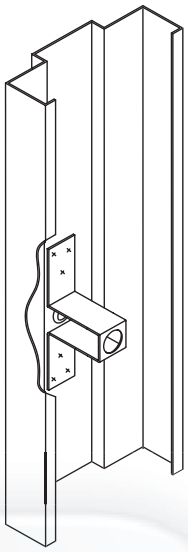
WELDED STEEL FRAME INSTALLATION DETAILS FOR EXISTING WALLS

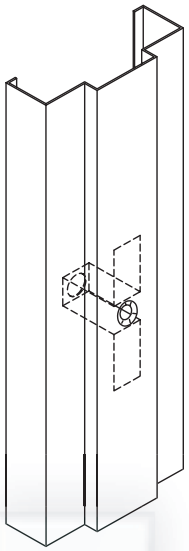
Frames for existing masonry walls are provided pre-machined with dimpled spacer holes to receive $^{3}/_{8}$" expansion bolts and shields. This anchor type may also be utilized to anchor frames to existing wood stud framed openings.

Anchors are spaced no more than 30" apart with the first anchor being located approximately 12" from the bottom of the frame.

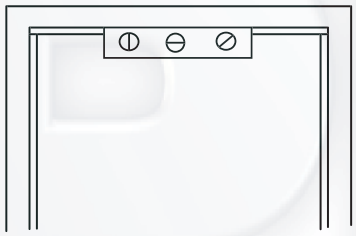








1) Place frame in opening and level the head by shimming the bottom of the frame as required.



2) Plumb the jambs and square the head.

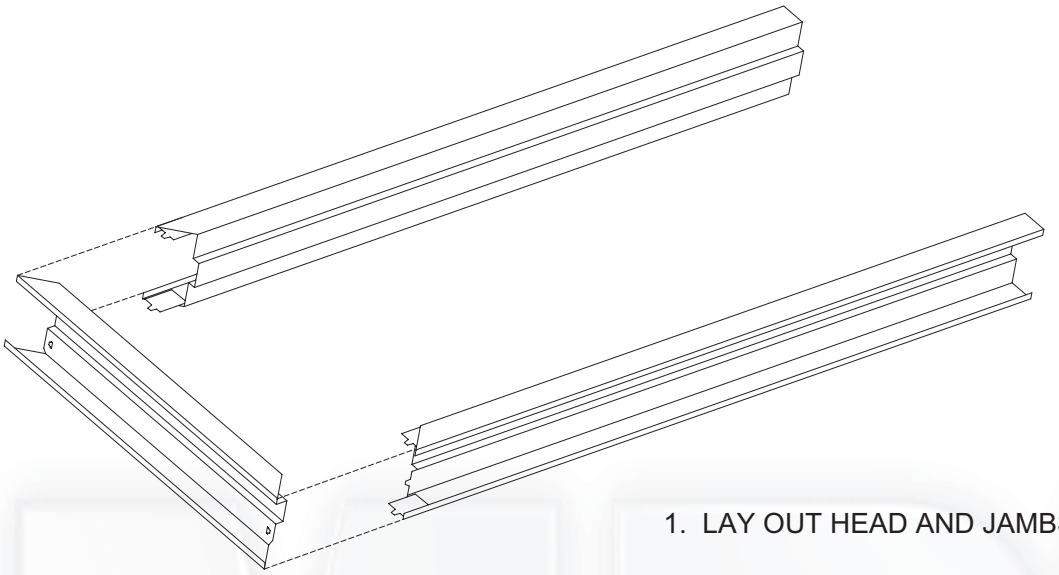
3) Mark masonry wall through spacer holes in the frame.

4) Remove the frame from the opening and drill holes as required to receive spacer.

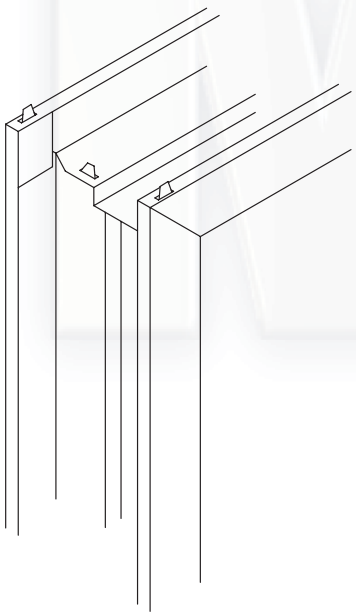
5) Install shields in the holes at fire rated openings.

6) Replace frame and attach to wall using flat head bolts supplied with anchor.

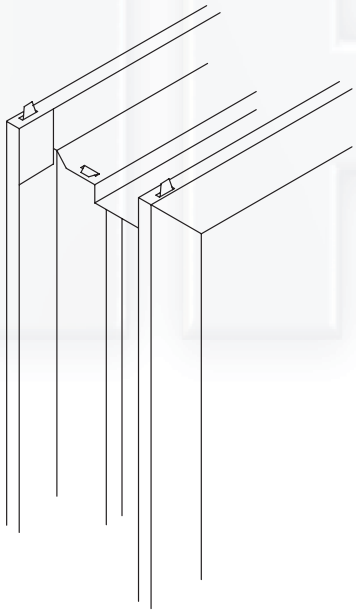
ASSEMBLY INSTRUCTIONS FOR KNOCK DOWN FRAME



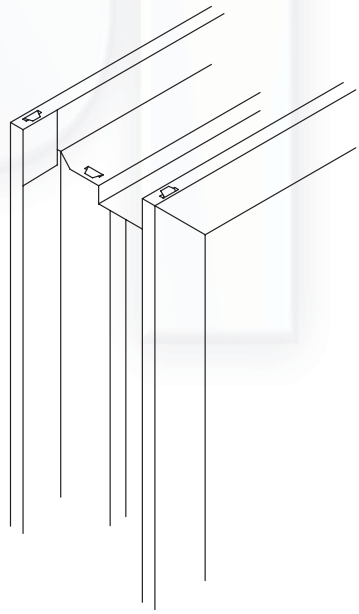
1. LAY OUT HEAD AND JAMBS AS SHOWN



2. Slide head on jambs, inserting jamb tabs into head slots



3. Bend tabs in head away from center of head toward the outside edge, flat against surface

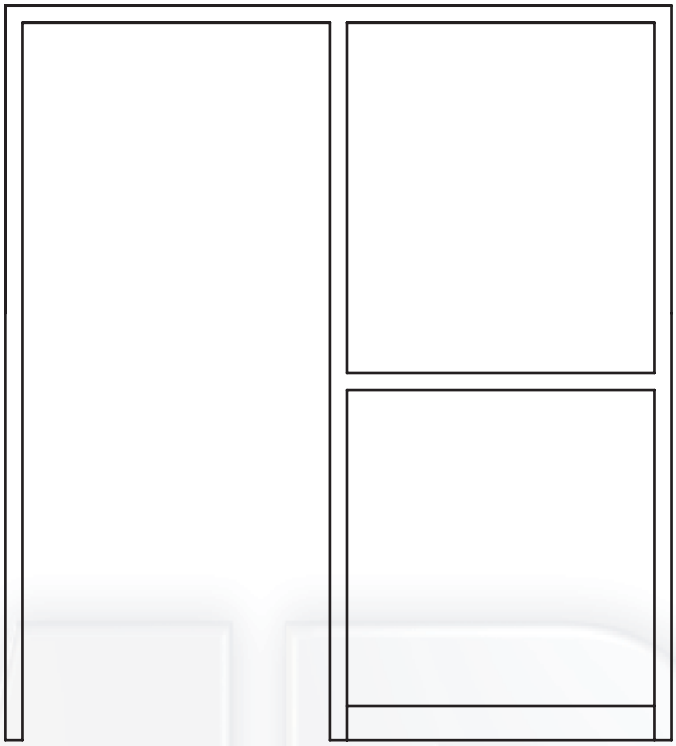


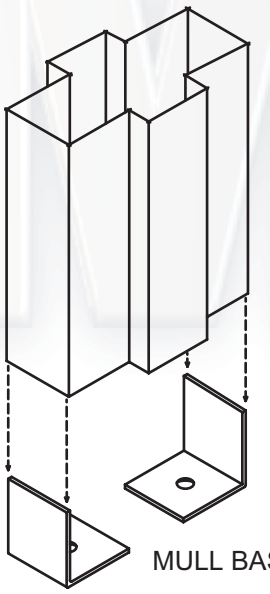
4. Bend tabs on return of frame toward the opposite return and flat against the surface

Refer to Frame Installion Drawings TDF 15, TDF 16, TDF 17 and TDF 18 for additional information

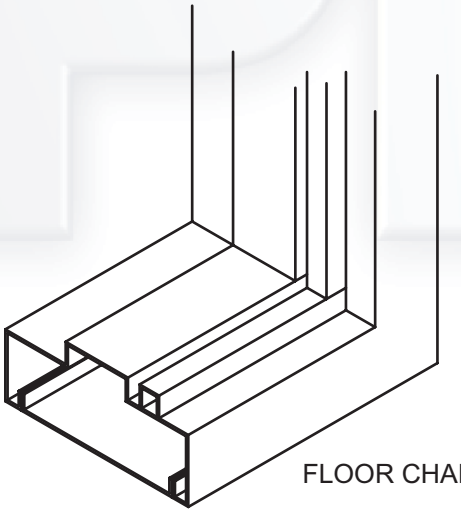
TDF 19

KD Frame Assembly





MULL BASE ANCHORS



FLOOR CHANNEL

MULL BASE ANCHOR IS USED TO SECURE VERTICAL MULLIONS TO THE FLOOR. THE ANCHOR IS ATTACHED TO THE FLOOR AND MULLION SLIPS DOWN OVER. FLOOR CHANNEL IS USED TO SECURE FULL HIGHT SIDELIGHT FRAMES AND WINDOW WALL FRAMES TO THE FLOOR. CHANNEL IS ATTACHED TO THE FLOOR AND FRAME SLIPS OVER.

TDF 20

MULL BASE ANCHOR & FLOOR CHANNEL INSTRUCTIONS