HOLLOW METAL DOOR/WINDOW SYSTEM FOR THERMALSAFE® CF WALLS WINDOW ASEMBLY GUIDE



PIONEERING INSULATED METAL PANEL TECHNOLOGY



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INTRODUCTION

Metl-Span has developed a hollow metal door and window system to further complement the exceptional function and performance of the ThermalSafe[®] and CF wall panels.

When used in a ThermalSafe wall, the doors and windows may be fire resistance rated. This is the first and only UL rated system of fire rated doors and windows for walls constructed of mineral fiber insulated panels. Just another example of Metl-Span's pioneering role in composite panel technology.

The door/window framing system allows standard door and window units (provided by the contractor) to be integrated within ThermalSafe and CF walls, with minimum intrusion into the interior space, and do so with great flexibility of door and window types, configurations, size and options. The system even allows doors and windows to be combined to provide for transoms and sidelights etc.

Included within this bulletin are the system's description, architectural details and installation details. This information is intended to be used by the building designer, specifier and the installer for their understanding of the system and its application.

The technical bulletin is to be used in conjunction with the project's installation drawings or specifications. In case of conflict between the information in this bulletin and installation drawings or specifications, the drawings or specifications will govern.

The customer is responsible for selecting competent building designers, door/window manufacturers and installers, and must ensure that the applications of the door /window system are suitable for the specific building conditions and are in accordance with good engineering and construction practices and all applicable building codes and regulations.

Metl-Span does not guarantee and is not liable for the quality of the door /window design, fabrication and installation, and is not responsible for defects that are attributable to improper design, fabrication, installation or negligence by other parties.

Clarifications concerning the door/window system should be directed to:

Metl-Span Technical Services Department 1497 N. Kealy, Lewisville, TX 75057 TEL: (877) 585-9969 FAX: (972) 436-7028 E-MAIL: panel@metlspan.com WEB: **METLSPAN.COM**

DOOR/WINDOW SYSTEM DESCRIPTION

General: the door/window system provides for the integration of hollow metal framed door and window assemblies into walls constructed of Metl-Span's ThermalSafe[®] and CF insulated panels.

The door and window assemblies and installation materials are to be provided by the contractor in accordance with the specifications in this technical bulletin.

Fire Resistance Rated: when used in ThermalSafe walls, the door and window assemblies may be fire resistance rated by UL (Underwriters Laboratory, Inc.). When used in CF walls, door and window assemblies are not fire resistance rated.

Door assemblies constructed in accordance with UL Assembly No. SP-2-001, and the requirements specified in this technical bulletin, will meet the criteria of UL 10B, UL10C, CAN4-S104 and UBC Standard 7-2 (1997) for a 1 $^{1}/_{2}$ hr. (maximum) fire resistance rating.

Window assemblies constructed in accordance with UL Assembly No. WA-2-001, and the requirements specified in this technical bulletin, will meet the criteria of UL 9, CAN4-S106 and UBC 7-4 (1997), tested under positive pressure for a $11/_2$ hr. (maximum) fire resistance rating.

UL Assemblies No. SP-2-001 and WA-2-001 provide for a broad range of door and window options. Refer to these assemblies in the UL online certifications directory for specific description of the options.

Wall Requirements: the door/window system may be used in walls consisting of Metl-Span's ThermalSafe or CF wall panels.

Doors and windows assemblies may be fire resistance rated only when used in ThermalSafe walls which are constructed in accordance with UL Design No. U050.

The door/window system may be used in exterior walls and interior walls (partitions), and the wall panels (including fire rated walls) may be vertically or horizontally oriented.

The allowable wall panel thickness is dependent upon the door/window frame depth and fire resistance rating (when applicable). Reference the "Frame Schedule" on the following pages of this bulletin.

Frame Construction: the door and window frames are to be of standard hollow metal (drywall) design, consisting of jamb and head members for doors, and jamb, head and sill members for windows.

The standard frame depth is either 5 3/4" or 8 3/4", depending upon the wall panel thickness.

DOOR/WINDOW SYSTEM DESCRIPTION (CONT.)

The maximum allowable frame size for doors, windows or door/window combinations is 8' wide x 8' high (inside opening).

The frame members are to be made of 16 gauge (min.) steel, with 2" wide faces and 1/2" deep returns with 3/8" (min.) wide back bend.

Door frame corner connections may be welded or knock down (KD) for field assembly. Window frame corner connections are to be welded.

The frames may include horizontal or vertical mullions, as required for division of glazing or separation of doors and windows areas within the same frame.

Self-Flashing Design: the edges of the wall panels are enclosed within the frame members, and the exterior face of the frame is set flush against the wall surface. In this manner, the door and window frames are self-flashing on the exterior, and there is minimum intrusion of the frames into the building's interior space.

Head Options: optional surface mounted drip gutters or thru-the-panel head flashing may be used above the door/window assembly.

The optional drip gutter is recommended for exterior doors and windows when the wall panel joints have the weather/vapor seal at the exterior side.

The optional head flashing is recommended for exterior doors and windows when the walls have self-draining joints with the weather/vapor seal at the interior side of the wall.

Door Frame Base Clips: each door frame jamb is to be provided with a base clip. The floor mounting flange of the base clip is to project into the door opening for installation access of the masonry fasteners. The heads of the masonry fasteners are then covered by the threshold.

Support Framing System: support members (angles or channels) are to be provided to serve the multiple functions of connecting the door/window frame to the wall panels, providing structural support to the door/window assembly, and function as flashing which covers the gap between the interior perimeter of the frame and the interior wall surface.

The vertical jamb support members span between the wall's base framing member and the horizontal wall framing member above the door/window assembly, and are connected to these members.

DOOR/WINDOW SYSTEM DESCRIPTION (CONT.)

The horizontal head and sill support members span between the jamb support members.

The support members are attached to the door/window frame and interior wall panel surface with #12 self-drilling screws.

Support Framing Design: the support members are to be designed as angle or channel sections with sufficient material thickness and web depth to provide the required structural support in accordance with project's design loads.

When allowed by the load/span requirements, the web depth of the support angles may be limited so it does not project beyond the interior face of the door/window frame.

Seals (fire rated doors and windows only): the cavity between the inside of the frame members and the cut edge of the wall panels is to be continuously filled with 1" thick, 4 pcf (min.) density mineral fiber batt insulation.

On the exterior side of the wall, the perimeter of the frame is continuously sealed to the wall surface with a 1/16" thick x 1/2" wide intumescent weatherstrip tape*.

On the interior side of the wall, the support framing members are continuously sealed to the wall surface with a 1/16" thick x 1" wide intumescent tape*, and the support framing members are continuously sealed to the interior perimeter of the door/window frame with a 1/16" thick x 1/2" wide intumescent tape*.

* The intumescent tapes are to be "Blaze Seal" brand manufactured by Rectorseal Corp., Phone: 1-800-231-3345

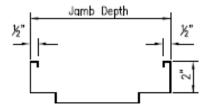
Seals (non-fire rated doors and windows): on non-fire rated door and window assemblies, the cavity between the inside of the frame members and the cut edge of the wall panels is to be continuously filled with fiberglass batt insulation.

The door/window frame may be sealed to the wall surfaces with butyl tape or urethane sealant as determined by the weather and vapor seal requirements.

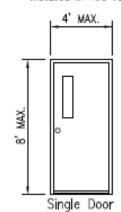
DOOR & WINDOW FRAME VARIATIONS

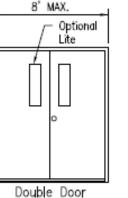
MSS110.001

Available Fire Resistance Ratings*					
Wall Pane Thickness		Door/Window Fire Rating	Frame Jamb Depth		
4" min.	1 hr.	1 hr.	5 ¾" min.		
7" min.	2 hr.	1 ½, hr.	8 ¾" min.		
8"	3 hr.	1 ½ hr.	9 ¾" min.		

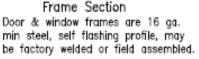


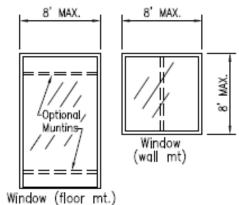
* Door & window fire ratings only applicable for doors and windows installed in fire rated ThermalSafe wall.





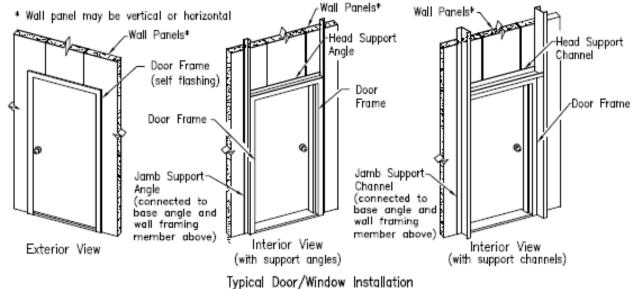






Combinations Window (floor m

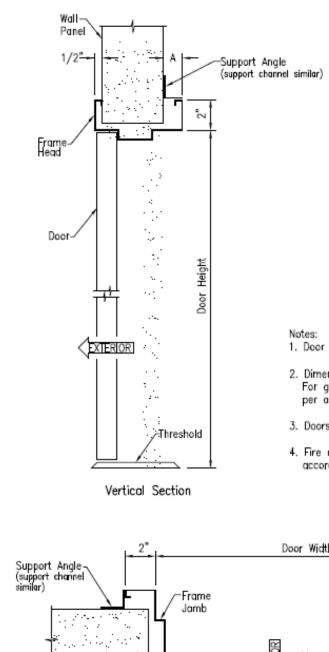
Allowable Sizes and Configurations for Fire Rated Doors & Windows (non-fire rated doors & windows are not subject to these limitations)



(door assemblies shown, windows similar)

GENERAL DOOR SECTIONS

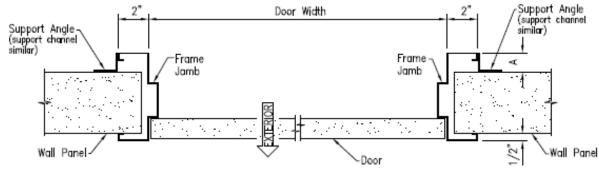
MSS110.002



Door Frame Size					
Wall Panel Thickness	Jamb Depth	Door/Window Fire Rating*			
4"	5 ¾* min.	1 hr.			
5"	6 ¾" min.	1 hr.			
6"	7 ∛4" min.	1 hr.			
7"	8 ¾ min.	1 ½ hr.			
8"	9 ¾* min.	1 ½, hr.			

 Fire rating applicable only when installed in ThermalSafe wall.

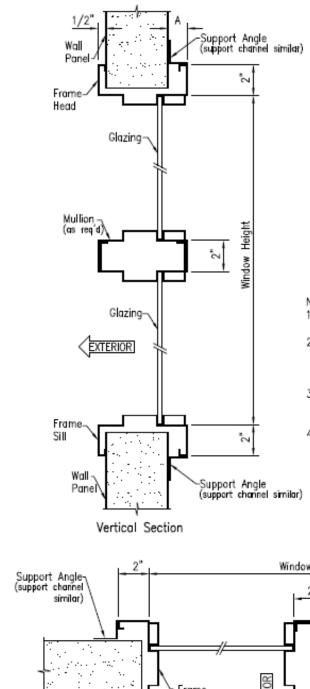
- 1. Door frame is 16 ga. min. steel self-flashing profile.
- Dimension A is 1 ¼" when min. depth jamb is used. For greater depth jambs, dimension A is increased per amount of additional depth.
- 3. Doors may be outswing or inswing (outswing shown).
- Fire rated doors and frames must be UL listed and in accordance to UL Design No. GSNN.SP-2-001.



Horizontal Section

GENERAL WINDOW SECTIONS

MSS110.003

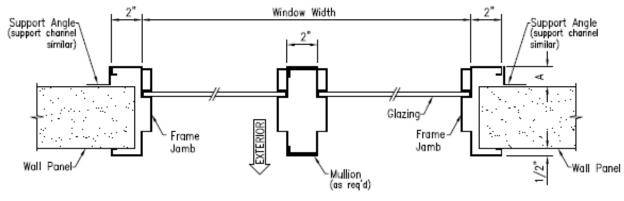


Window Frame Size				
Wall Panel Thickness	Jamb Depth	Door/Window Fire Rating*		
4"	5 ¾" min.	1 hr.		
5"	6 ¾" min.	1 hr.		
6"	7 ¾" min.	1 hr.		
7"	8 ¾" min.	1 ½ hr.		
8"	9 ¾" min.	1 ½, hr.		

 Fire rating applicable only when installed in ThermalSafe wall.

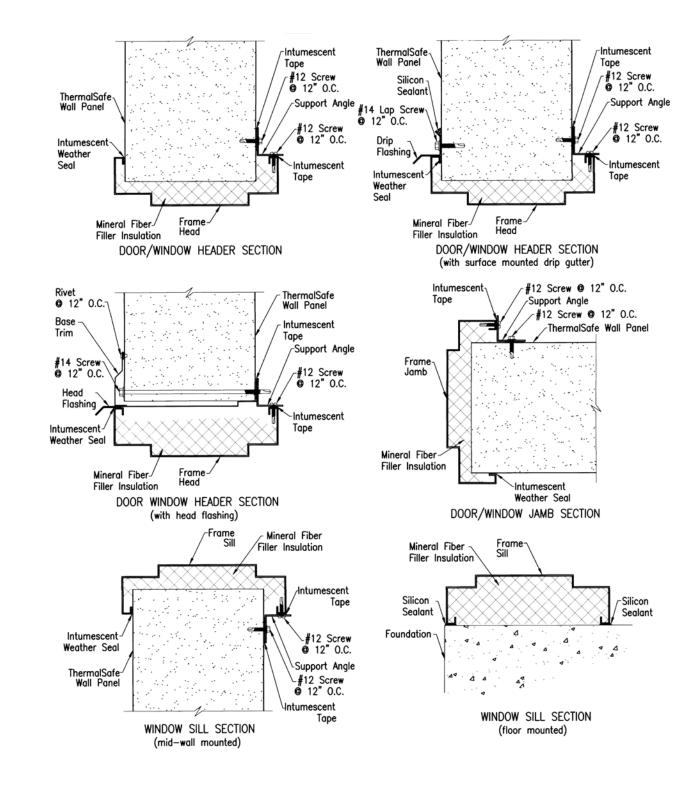
Notes:

- 1. Window frame is 16 ga. min. steel self-flashing profile.
- Dimension A is 1 ³/₄" when min. depth jamb is used. For greater depth jambs, dimension A is increased per amount of additional depth.
- Window may be exterior glazed or interior glazed (exterior glazed shown).
- Fire rated window frames must be UL listed and in accordance to UL Design No. GSNN.WA-2-001.

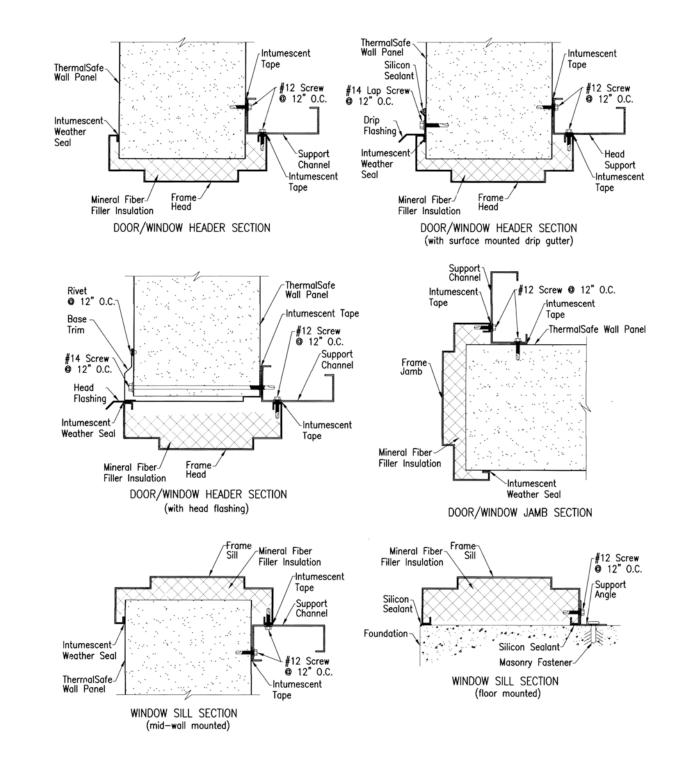


Horizontal Section

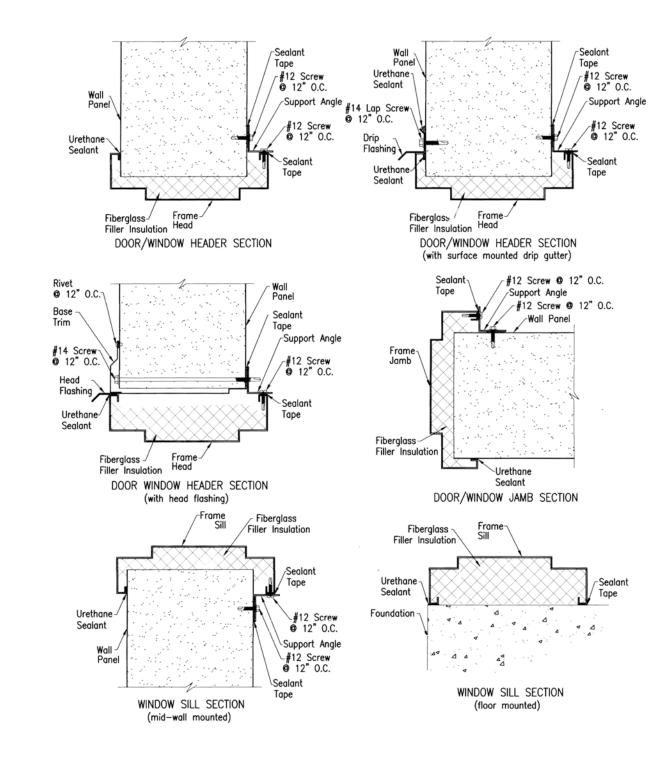
FIRE RATED DOOR & WINDOW FRAME SECTIONS (with support angles)



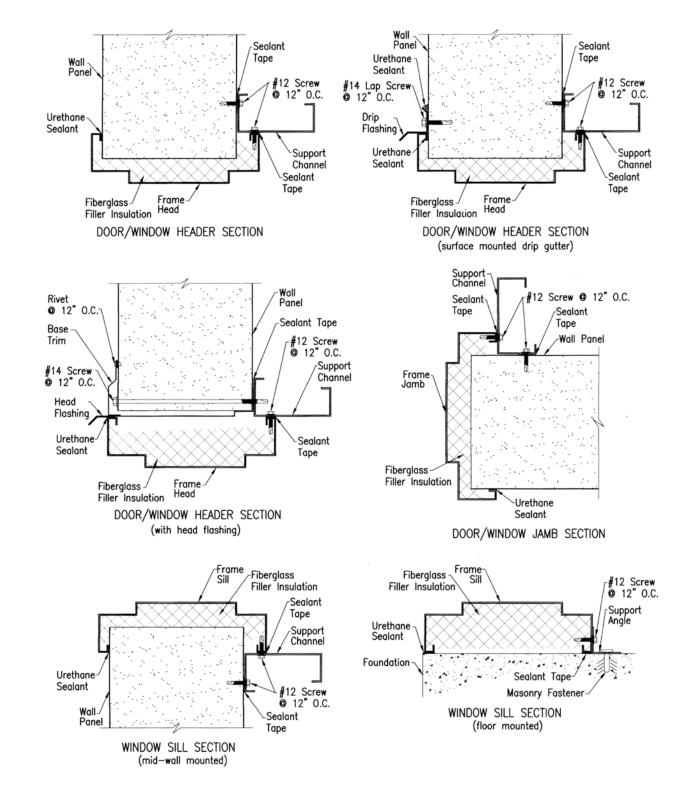
FIRE RATED DOOR & WINDOW FRAME SECTIONS (with support channels)



NON-FIRE RATED DOOR & WINDOW FRAME SECTIONS (with support angles)



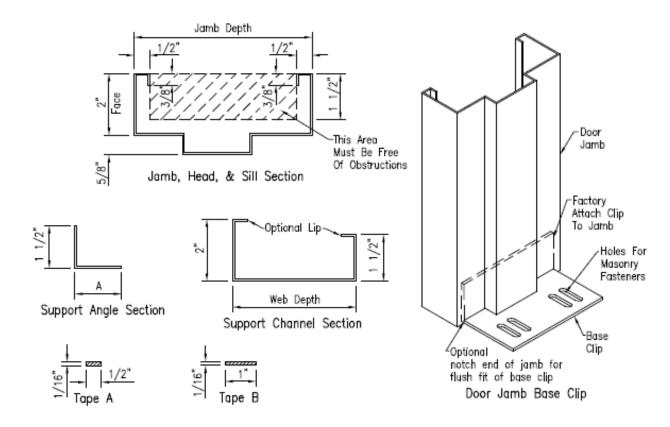
NON-FIRE RATED DOOR & WINDOW FRAME SECTIONS (with support channels)



REQUIREMENTS FOR FRAMING PARTS

MSS110.008

General: The door/window frame, support members and the intumescent tapes for the fire rated frames are to be provided by the contractor. Following are specific requirements for those parts.



Frame Description

Hollow metal frame with $\frac{1}{2}$ " returns and $\frac{3}{4}$ " min. back bends, 16 gauge min. steel, fully welded or knock down design. Jamb depth equals wall thickness plus 1 $\frac{3}{4}$ " (min.). Requires factory attached base clip (see detail). Fire rated frames must be UL listed.

Jamb Support Angle

16 ga. min. steel angle. Provides minimum projection into building interior when an angle is adequate for design loads. Dimension A is 1 ¾" when frame is at min. jamb depth allowed for the panel thickness. For greater jamb depths, increase dimension A as required.

Jamb Support Channel

16 ga. min. steel channel. Provides greater load resistance than angle. Web depth determined by design wind load requirements. Web depth cannot be less than dimension A.

Intumescent Tapes

Fire rated doors and windows require the following intumescent fire seal tapes:

- Tape A X₆" x ½" intumescent tape for fire seal of frame to exterior wall panel surface and fire seal of frame to jamb support. Approved tape is "Blaze Seal" brand by Rectorseal Corp.
- Tape B ¼₆" x 1" intumescent tape for fire seal of jamb support to interior wall panel surface. Approved tape is "Blaze Seal" brand by Rectorseal Corp.

DOOR & WINDOW FRAMING ASSEMBLIES

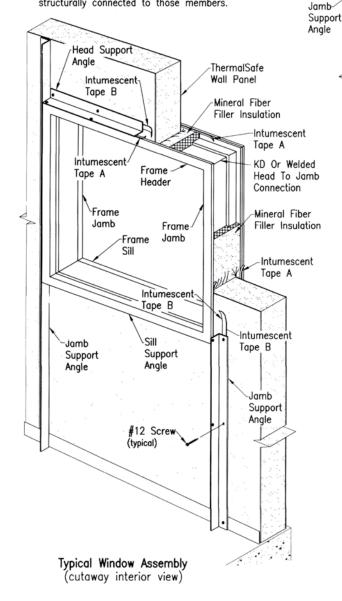
MSS110.009

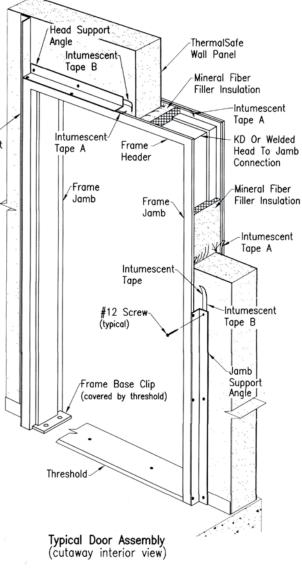
General:

The following cutaway views show the door and window assemblies within the wall paneling. The support members are shown as support angles, support channels are similar.

Support Framing:

The support angles or channels extend from the base framing to the horizontal wall framing above, and are structurally connected to those members.





Intumescent Tapes:

The intumescent tapes are required for sealing fire rated door and window assemblies only.

Non-fire rated door/window frames may be sealed with butyl tape or urethane sealants, depending upon weather and vapor seal requirements.

WALL PANEL CUTOUTS

MSS110.010

General:

The following details show the wall panel opening requirements for door and window frames.

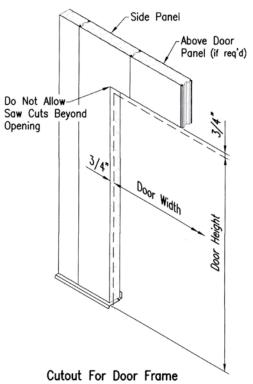
Reference the ThermalSafe or CF panel installation guide for panel cutting instructions.

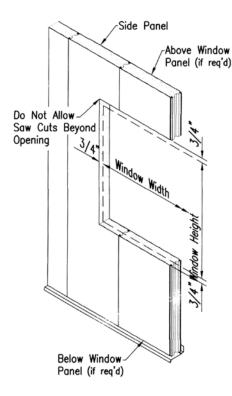
Field Assembled Frames:

Field assembled door frames (KD frames) may be installed after the wall installation is completed. The wall panels may be cut for the opening during or after the panels are installed.

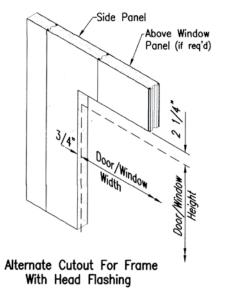
Welded Frames:

Welded door and window frames must be installed in sequence with the wall panel installation. The wall panels must be cut for the opening as the panels are installed.









DOOR & WINDOW FRAME PREPARATION

MSS110.011

General:

The following details show the application of filler insulation and exterior seal to the frame.

Filler insulation and sealant must be applied before the frame is installed into the wall assembly.

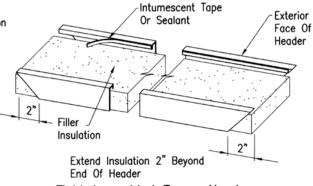
Weatherseal:

For fire rated doors/windows, apply χ_6 "x χ_2 " intumescent – tape (tape A) to the exterior back bend of the frame.

For non-fire rated doors/windows, apply tape sealant or urethane sealant as specified for weather and vapor seal requirements.

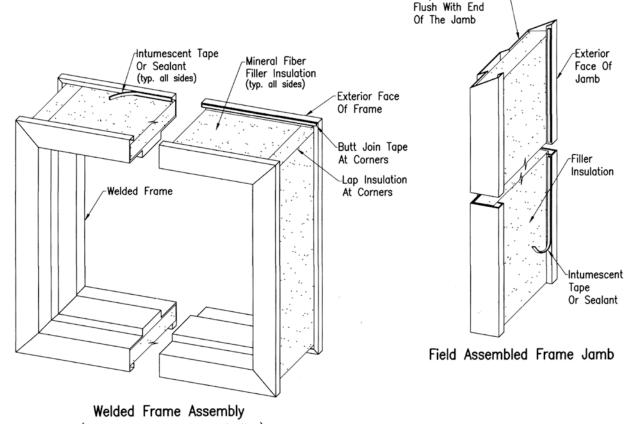
Filler Insulation:

For fire rated doors/windows, install 1" thick mineral fiber insulation into the frame recess. For non-fire rated doors/windows, fiberglass insulation may be used.



Field Assembled Frame Header

Stop The Insulation-



(window shown, door similar)

INSTALLING WINDOW FRAME

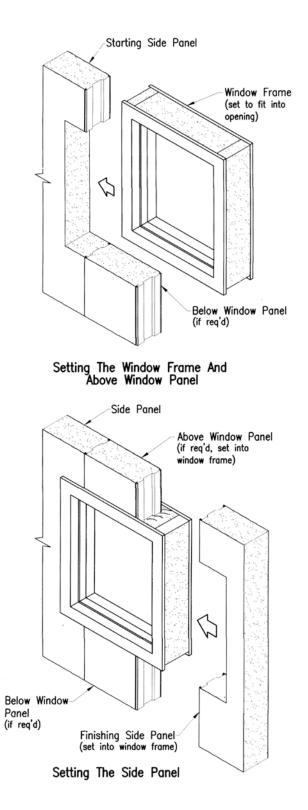
MSS110.012

General:

The following views show the installation of the window frame into the wall assembly.

The window frame must be installed in sequence with the wall panel assembly.

For wall panel assembly instructions, refer to the ThermalSafe wall or CF wall installation guide.



Installation Sequence: Step 1: Install the starting side panel.

Step 2: (If required) install below window panel.

Step 3: Slide window frame into side panel opening and set over the below window panel.

Step 4: (If required) install above window panel.

Step 5: Install the finishing side panel.

Caution:

Do not displace or damage tape sealant and filler insulation when installing the window

INSTALLING DOOR FRAME

MSS110.013

General:

The following views show the installation of the field assembled door frame into the wall assembly.

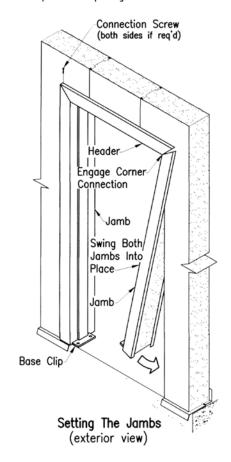
For welded door frames, refer to the window installation instructions on the previous page.

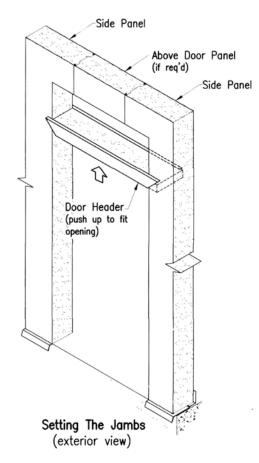
Caution:

Do not displace or damage tape sealant and filler insulation when installing the door.

Installation Sequence:

Step 1: Push the frame header up into position at the top of the opening.





Step 2:

Tilt one of the frame jambs as necessary to engage its top end into the end of the header member.

Step 3: Swing the jamb to the vertical position.

Step 4: Install the other frame jamb in the same manner as the first jamb.

Step 5: (If required) install screws or bend tabs to secure the header to jamb corner connection.

Refer to the door manufacturer's instructions for the header to jamb assembly requirements.

ALIGNMENT OF DOOR & WINDOW FRAME

MSS110.014

Door Alignment:

The following alignment of the frame may be easier if the door leaf is installed.

Step 1:

Center the frame in the opening. Check that the opening is fully covered by the frame on both sides of the wall.

Step 2:

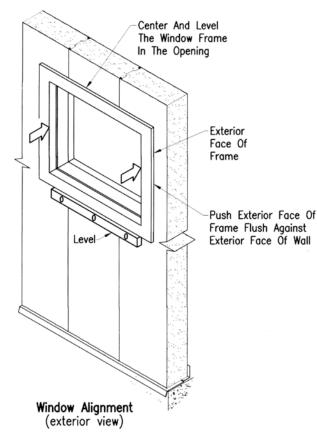
Square the frame and set the base of the frame at the required width.

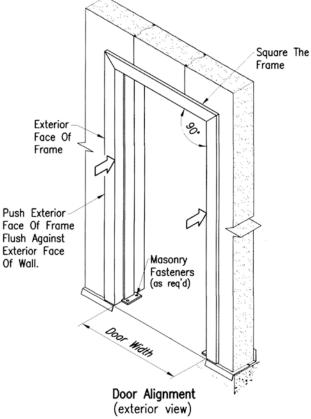
Step 3:

From the exterior side, push the door frame tight against the wall so the intumescent tape or sealant seals the frame to the wall surface.

Step 4:

Install the masonry anchors to secure the base clips to the floor.





Window Alignment:

Step 1:

Center the frame in the opening. Check that the opening is fully covered by the frame on both sides of the wall.

Step 2:

Check that the window frame is level.

Step 3:

From the exterior side, push the door frame tight against the wall so the intumescent tape or sealant seals the frame to the wall surface.

DOOR-INTERIOR SEAL & SUPPORT FRAMING

MSS110.016

General:

The following views show the installation of the interior seal and the support framing.

Caution:

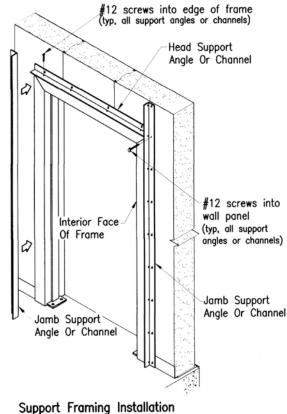
The door frame must be held tight against the exterior face of the wall during the installation of the support framing.

Interior Seal:

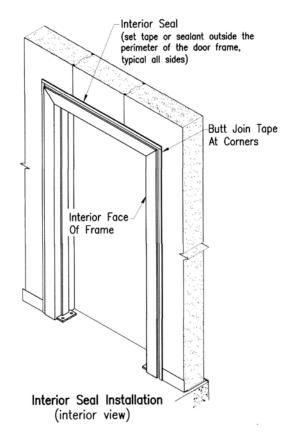
For fire rated door, apply K_6 " x 1" intumescent tape (tape B) to interior wall surface.

For non-fire rated door, apply tape sealant or urethane sealant to interior wall surface.

Apply the tape or sealant immediately outside the perimeter of the door frame, so the tape or sealant will be covered by the support framing.



(interior view)



Support Framing:

Step 1:

Install the head and jamb supports (angles or channels) flush against the edge of the frame and flush against the interior surface of the wall.

Step 2:

Fasten the supports to the wall with #12 screws spaced at 3" from each end of the angle or channel and 12" between.

Step 3:

While pushing the frame tightly against the exterior face of the wall, fasten the supports to the lip of the frame with #12 screws spaced at 3" from each end of the angle or channel and 12" O.C. between.

Step 4:

Connect the jamb supports to the base angle and to the wall support framing above.

WINDOW--INTERIOR SEAL & SUPPORT FRAMING

MSS110.017

General:

The following views show the installation of the interior seal and the support framing.

Caution:

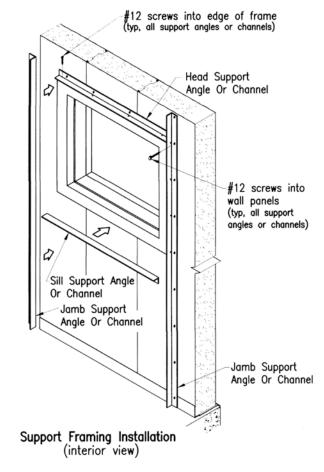
The window frame must be held tight against the exterior face of the wall during the installation of the support framing.

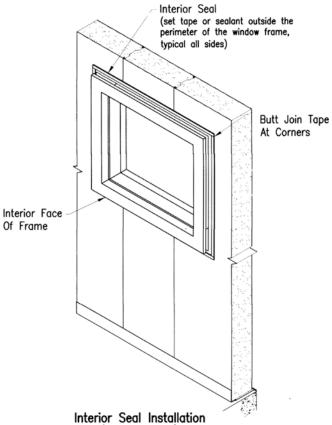
Interior Seal:

For fire rated door, apply χ_{16} " X 1" intumescent tape (tape B) to interior wall surface.

For non-fire rated door, apply tape sealant or urethane sealant to interior wall surface.

Apply the tape or sealant immediately outside the perimeter or the door frame, so the tape or sealant will be covered by the support framing.





Support Framing:

Step 1:

Install the head, sill and jamb supports (angles or channels) flush against the edge of the frame and flush against the interior surface of the wall.

(exterior view)

Step 2:

Fasten the supports to the wall with #12 screws spaced at 3" from each end of the angle or channel and 12" O.C. between.

Step 3:

While pushing the frame tightly against the exterior face of the wall, fasten the supports to the lip of the frame with #12 screws spaced at 3" from each end of the angle or channel and 12" O.C. between.

Step 4:

Connect the jamb supports to the base angle and to the wall support framing above.

DOOR & WINDOW DRIP GUTTER INSTALLATION

MSS110.018

General:

Drip gutter is recommended for exterior doors and windows when the exterior side of the wall panel joints are sealed with joint sealant.

Sealant:

For panel joint pigtail; use silicone sealant on ThermalSafe wall and urethane sealant on CF wall.

For exterior flashing sealant and optional edge of frame sealant; use silicone sealant on ThermalSafe walls, and use UL approved fire resistant sealant on fire rated walls.

Installation Sequence:

Step 1:

During wall panel installation, apply a sealant pigtail at the interior side of each panel joint. Position pigtail at $1\frac{1}{2}$ " above panel cut-out.

Step 2:

Cut head flashing so the ends extend 2" beyond panel cut-out. Notch the ends to fit the cut-out.

Step 3:

Apply $\frac{3}{2}$ " bead of sealant across ends and along back of flashing. Position back sealant $\frac{1}{2}$ " above horizontal leg of flashing.

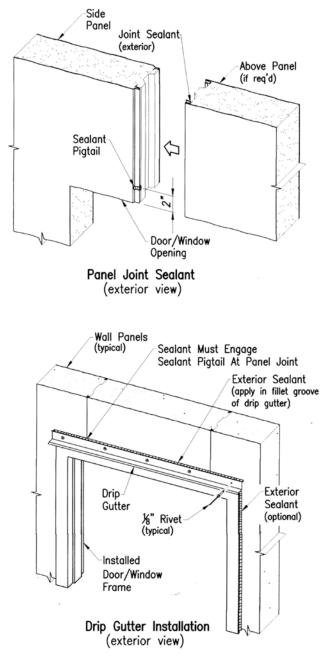
Step 4:

Insert head flashing into opening and push flashing up against the bottom edge of panel cut-out. Attach back of flashing to wall panels with rivets at each end and center of flashing.

Step 5:

Seal the extended end of the flashing to the exterior face of the wall panel with a $\mathcal{X}^{"}$ bead of sealant.

(if required) seal edge of door/window frame to exterior face of wall with $\frac{3}{6}^{6}$ bead of sealant.



Important:

For fire rated doors and windows, seal all exposed cuts or punctures on the exterior and interior wall faces with a UL approved fire resistant sealant.

DOOR & WINDOW HEAD FLASHING INSTALLATION

MSS110.019

General:

Head flashing is recommended for exterior doors and windows when the wall panel joints are selfdraining to the exterior and are sealed with joint sealant only at the interior side of the joint.

Sealant:

For head flashing end sealant and panel joint pigtail; use silicone sealant on ThermalSafe wall and urethane sealant on CF wall.

For exterior flashing sealant and optional edge of frame sealant, use urethane sealant for non-fire rated door/windows, and UL fire rated sealant for fire rated door/windows.

For fire rated doors and windows, use χ_6 " X 1" 0 intumescent tape on back of head flashing. For non-fire rated doors and windows, use tape sealant.

Installation Sequence:

Step 1:

During wall panel installation, apply a sealant pigtail at the interior side of each panel joint. Position pigtail at $1\frac{1}{2}$ " above panel cut-out.

Step 2:

Cut head flashing so the ends extend 2" beyond panel opening. Notch the ends to fit the opening.

Step 3:

Apply $\frac{3}{4}$ " bead of sealant across ends and along back of flashing. Position back sealant $\frac{1}{4}$ " above the horizontal leg of the flashing.

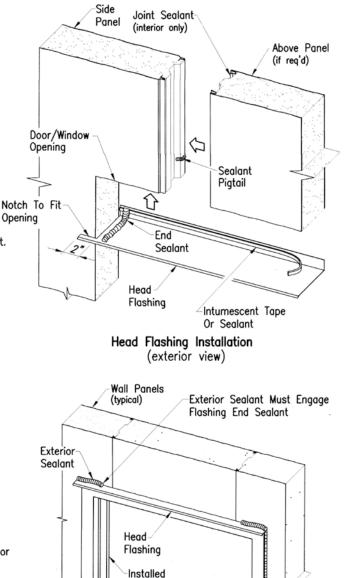
Step 4:

Insert head flashing into opening and push flashing up against the bottom of the wall panels. Attach back of flashing to wall panel with rivets at each end and center of flashing.

Step 5:

Seal the extended end of the flashing to the exterior face of the wall panel with a ¼" bead of sealant.

(if required) seal edge of door/window frame to exterior face of wall with $\frac{3}{6}$ " bead of sealant.



Door/Window

Exterior Sealant Installation (exterior view)

Exterior-Sealant (optional)

Frame

Important:

For fire rated doors and windows, seal all exposed cuts or punctures on the exterior and interior wall faces with a UL approved fire resistant sealant.

Notes:			
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