WEB BASED
APPLICATION SPECIFIC
INSTALLATION INSTRUCTIONS

Installing Patio and Entry Doors

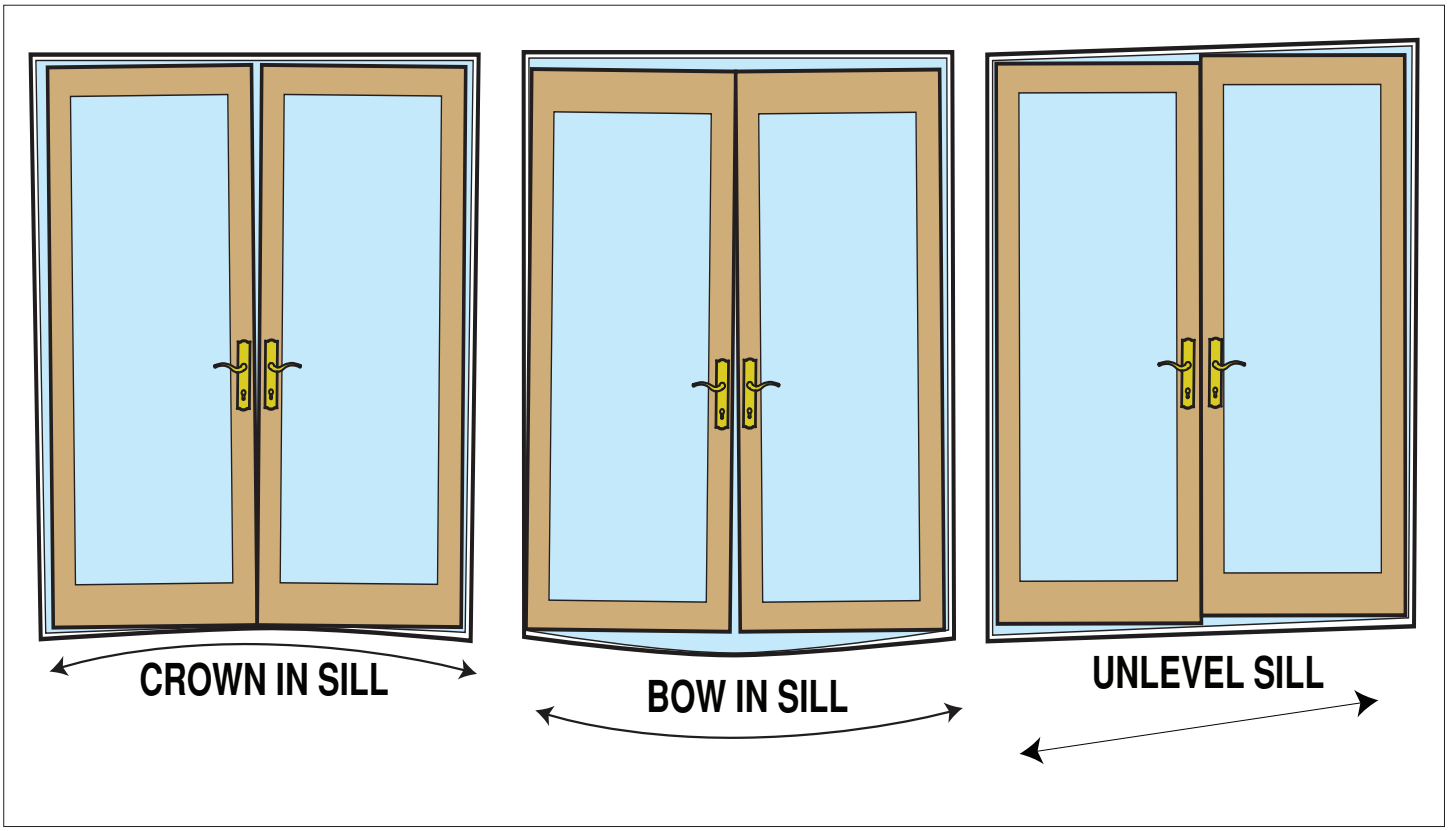
Installing Patio or Entry Doors

Installing Patio Doors or Entry Doors is similar to installing windows. In New Construction, preparation of the opening with proper flashing is key to preventing leaks and preserving energy performance. Installing doors in replacement applications is as complicated as replacing windows for the simple reason the removal of the old door is as destructive to the water management system as with any window tear-out.

There are three considerations with doors that require effort in the preparation to be sure that the resulting installation (new construction or replacement) allows the door to operate properly and be weather tight:

1. Level Sill. The biggest single problem source for poorly operating doors - either rolling or hinged - is an unlevel sill. As the artwork shows, a crown, a bow or a sill with one side higher than the other, will not allow the interlocks and weather stripping to engage as designed. If you start with a level sill, good results from the installation are all but assured. If you don't, then bad results will surely follow.

2. Weather resistant Sill. In new construction, establishing a level and properly draining sill that expels water and moisture that makes its way behind the weather



barrier and siding is key. In replacement, as the photos illustrate, removing an old door can either destroy the integrity of the old sill, or expose the fact that there was no integrity in the first place. Filling the old sub sill with mortar or even the same thin set as used with tiling floors, can create the sealed, level and strong sub sill a successful door installation requires.

3. Proper Sill Pan/Drainage. In heavy winds, water can literally blow under the door and up and over the back part of the door's operating track. In wind above 150 mph the water can "climb" upwards of 2 inches and over the sill into the room.

The first inclination is to seal the front of the operating track to prevent water from penetrating under the track and into the room. Doing so prevents another key function of the sill under the track - drainage. Proper technique requires a sill pan (see illustrations) to be placed under the track to allow water than may get into and round the opening to drain out. Creating the proper balance between protection from wind blown rain and sill drainage is difficult, but necessary.

Some manufacturers make a two piece sill/track to accomplish the goal, but in most instances sealing the front edge of the track, but leaving two 2-inch gaps in the seal, will protect against the window blown water, but allow drainage from the sill pan when necessary. Judgement can also be used considering location. If the doors are set back on a large porch, there is less worry about window driven rain. If the doors are near a corner of a balcony on a high floor, there is more concern for blocking wind-driven rain.

Summary: Make the sill smooth and level, use a sill pan and use clips/straps or conventional installation as shown in the window section. Be as mindful of flashing, sealing, and mounting hardware as for window products.

Finally, as with most door products, be sure to follow manufacturers' instructions as they have most likely designed their sill and track systems to comply with the requirements of the door's application.

Different Frame Types

There are three basic types of frame assemblies in order to mount doors to various types of wall construction.

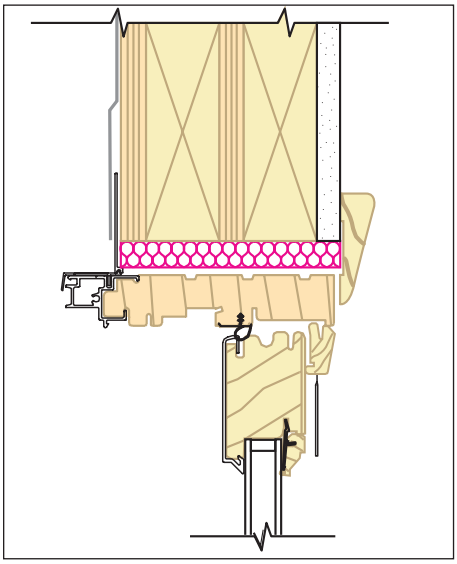
While the Brickmould Frame and the Flange Frame are designed to have the front of the frame rest outside the wall and cavity, the Flush Mount (often called Pocket Frame) where the frame sits inside the cavity, is commonly used, as well.

The Flush Mount is the preferred choice for replacement applications and for mounting on wood surrounds or buck installation. Small "frontal flanges" are used in masonry applications.

Check the factory recommended frame for the intended application.

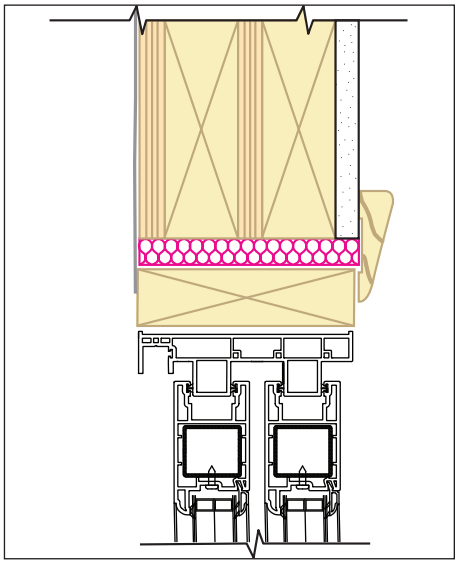
The details shown on these pages and in the basic installation details that follow are common. Situations may vary, and frame components may vary as well.

The illustrations below don't have exterior siding or other finish applied.

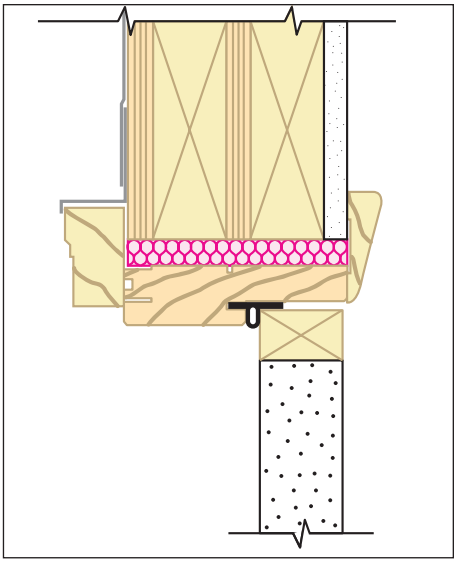


Flange Mount.
Clad Wood Doors and most Aluminum Sliding Doors have a frontal flange that rests against the exterior. When the flange projects 1-1/2" out from the frame, it is usually a nailing flange. If it projects less than 1", it is a flange to help establish a water barrier on the outside.

The flange can be set back, ("J" channel) to allow installing siding flush to the exterior face of the door.



Flush Mount
When there is no Brickmould or Flange/Fin, the door is usually set into a wood surround, or buck. This is common for replacement wood doors, and aluminum sliding patio doors.



Brickmould
Most Wood. Fiber Glass, and even Steel Entry Doors have a brickmould exterior. The Brickmould trim acts as a "mounting flange" and is how the door rests and seals against the exterior face of the wall.

Basic Installation

Step 1

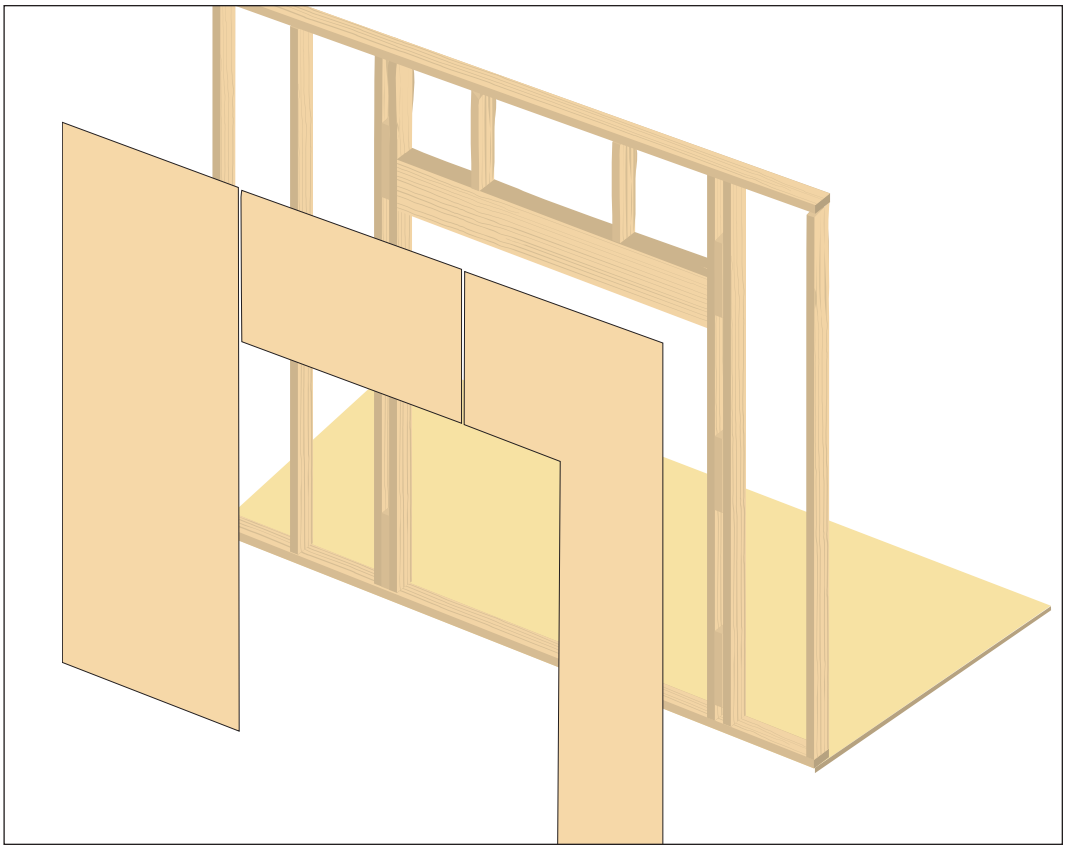
Standard construction steps apply. Proper framing and sheathing is also assumed as shown.

The sill is shown as even with the deck — perhaps the toughest to make level as required for proper installation.

Drip sill (set down 1/2" to 3/4" is better because it's easier make level after the deck is built, and to accommodate the sill pan.

Drop sills are more effective at keeping water from blowing under the doors, as well.

These instructions are basic for either approach.



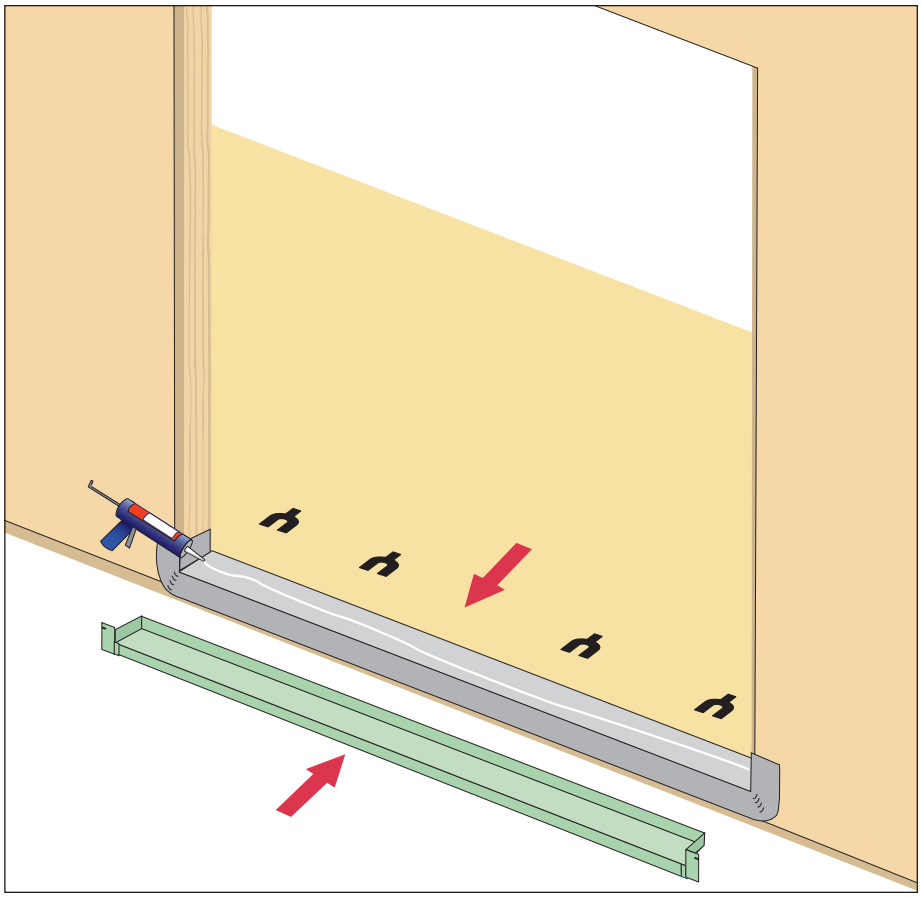
Step 2

After the sheathing is applied to the wall, install 9" wide, flexible flashing on the sill, overlapping the sill plate, and up the jambs, 6" to 9" high.

Place a bead of caulk/sealant along the top of the flashing to help secure the sill pan.

Prepare metal sill pan, or use a pre-manufactured plastic pan and place on top of the flashing — tight between the jambs — with the lip of the sill pan against the sill plate.

If shims are needed, use flat shims of 1/8" or less. Make sure they lie in a bead of caulk/sealant.



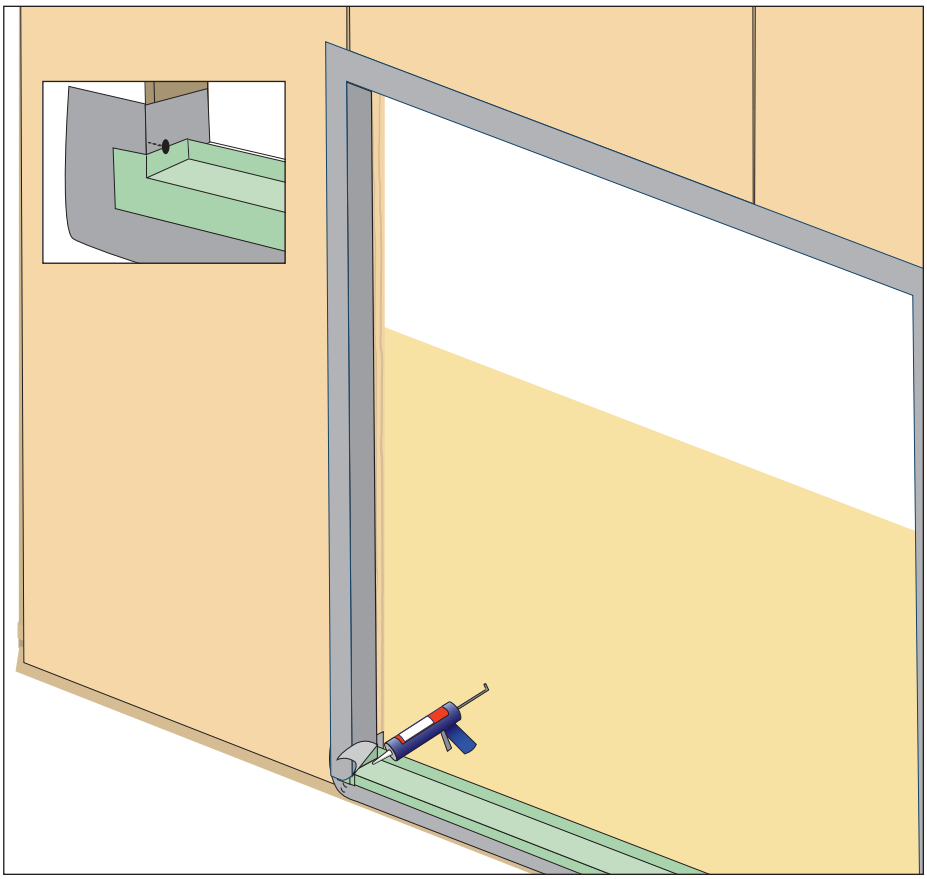
Basic Installation

Step 3

When securing the pan in the opening, do not puncture with nails as this would be a possible source of water instruction. Use a wide headed nail (like a roofing nail) to secure the top of the side dam to the jamb framing, as shown.

Place flexible flashing down each jamb over the sheathing allowing the flashing to wrap inward to cover the framing, as well. The jamb flashing should be long enough to overlap the side dams of the pan.

Place flexible flashing across top of opening, overlapping the jamb flashing, and wrapping under to cover the header of the rough opening framing.

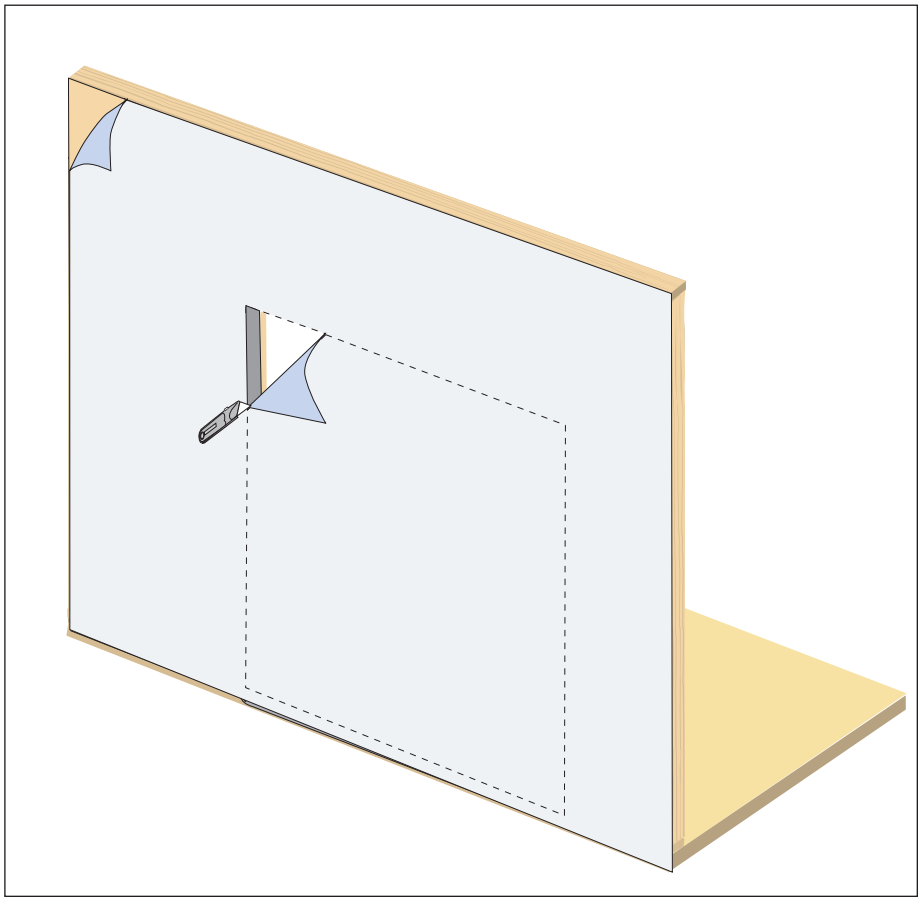


Step 4

Place Weather Resistive Barrier (WRB) over face of wall.

Cut WRB to opening height and width, as shown.

Take care when affixing the WRB to the wall not to rip or tear it, especially near the flashing at the jambs and header. This will limit any potential water penetration through the WRB.

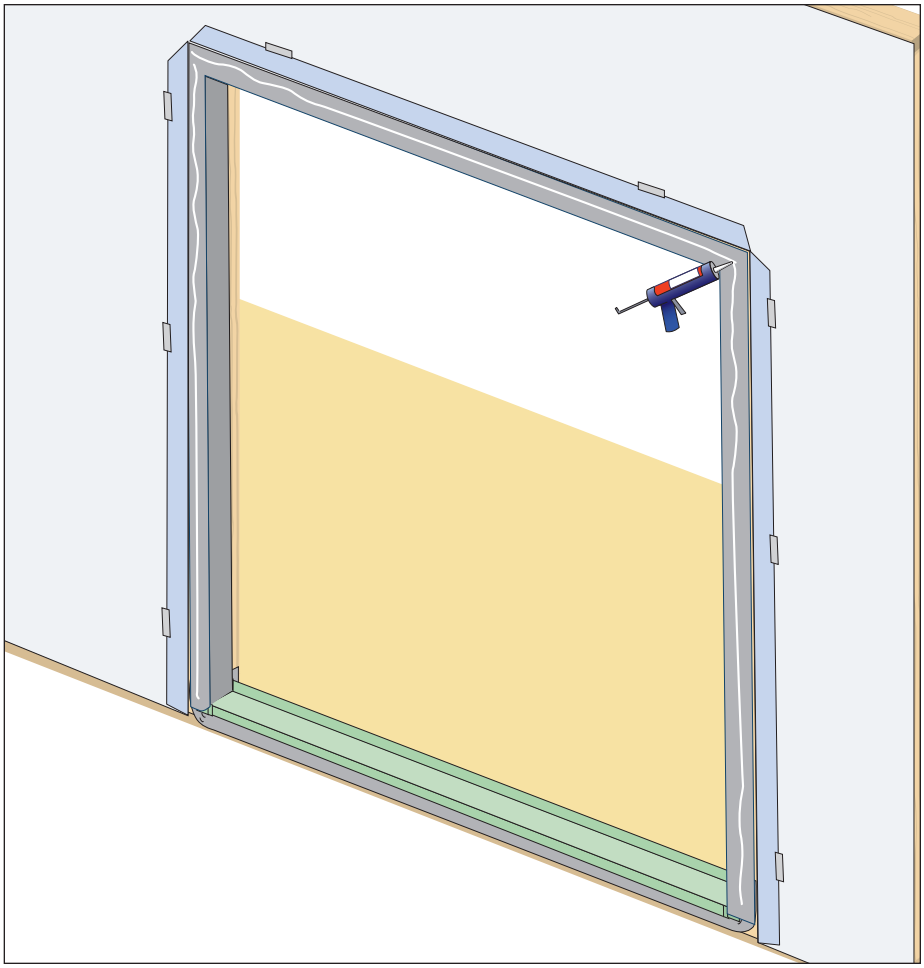


Basic Installation

Step 5

Cute WRB at corners to allow folding back and taping about 6", exposing the flashing as shown.

Place a bead of caulk down the jamb face and across the face of the header to allow the mounting flange of the door to rest against this sealant.

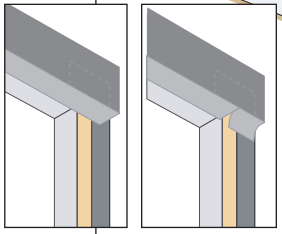


Step 6

Place mounting flange of door against the caulk/sealant as the door is placed in the opening. Do not put sealant across the sill pan because the pan needs to able to drain outward any wanter that gets into the cavity.

If the door is being mounted through the flange/fin, use Simplex nails or similar to be sure that the flange/fin can expand and contract without disturbing the flashing or the seal.

Place drip cap over the top of the door to direct water out to the sides. If possible, bend the horizontal member of the cap down at both jambs as shown.



Basic Installation

Step 7

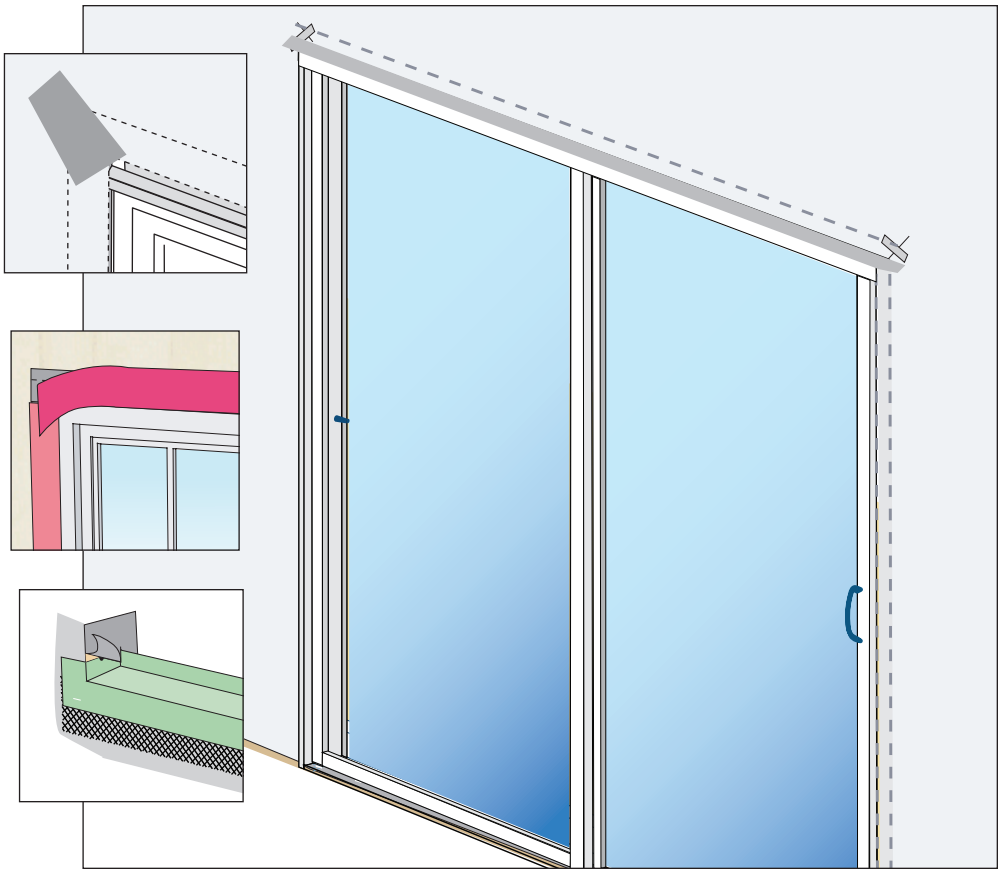
Unfold the Header WRB and lap over the drip cap as shown.

Tape the corner cuts with builders tape to make sure there is continuity of the WRB over the flashing.

If your door is going to be exposed to direct rainwater and wind, it would be best to use a second flexible flashing seal — over the WRB which is over the first layer of flexible flashing.

This second layer of flashing should be lapped to direct water down and out of the wall.

If the door is above grade, you may want to install a weep screed along the sill, between the lip of the sill pan and the exterior finish, as shown. This will make sure any water underneath the sill pan can drain as well.



Brickmould Installation

Step 7A

The brickmould trim outside many entry doors acts like a mounting flange, but it's dimensions make for some differences in installation.

Follow Steps 1 through 5.

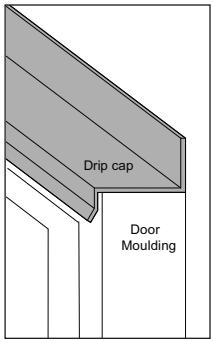
Place brickmould trimmed door into opening with the brickmould trim against the wall, which has caulk over the flexible flashing.

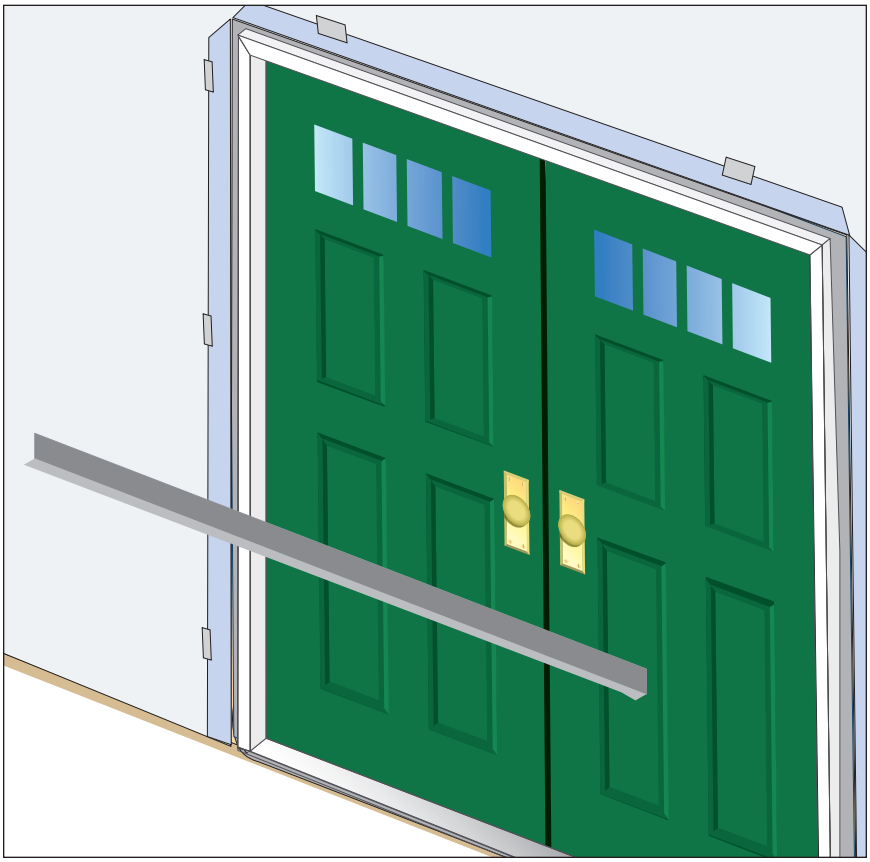
Anchor door as instructed by the manufacturer's instructions.

Brickmould Installation

Step 7B

Place drip cap across the header of the brickmould trim, making sure it extends out from the sides at least 1" to allow water to drain away and down.



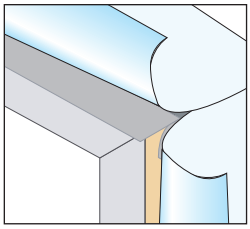


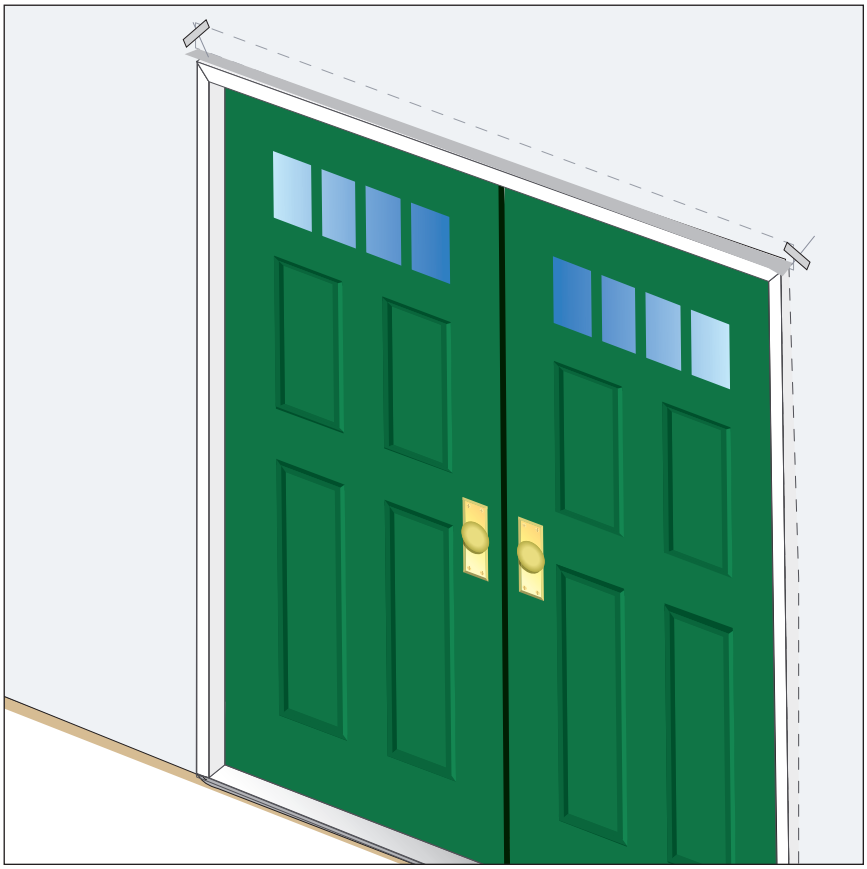
Step 7C

Unfold the WRB on the jams, Fold back against the sheathing, allowing the WRB to fold outward from the joint where the wall and the brickmould meet, as shown.

If siding, and/or "J" channel is to be used against the brickmould trim, trim the WRB back to allow a bead of finish caulk to seal the joint between the "J" Channel or siding and the brickmould.

Unfolding the WRB along the top to go over the vertical leg of the drip cap, and bend out to accommodate the "J" Channel and/or siding is the same as for the jambs.





Installing Replacement Doors

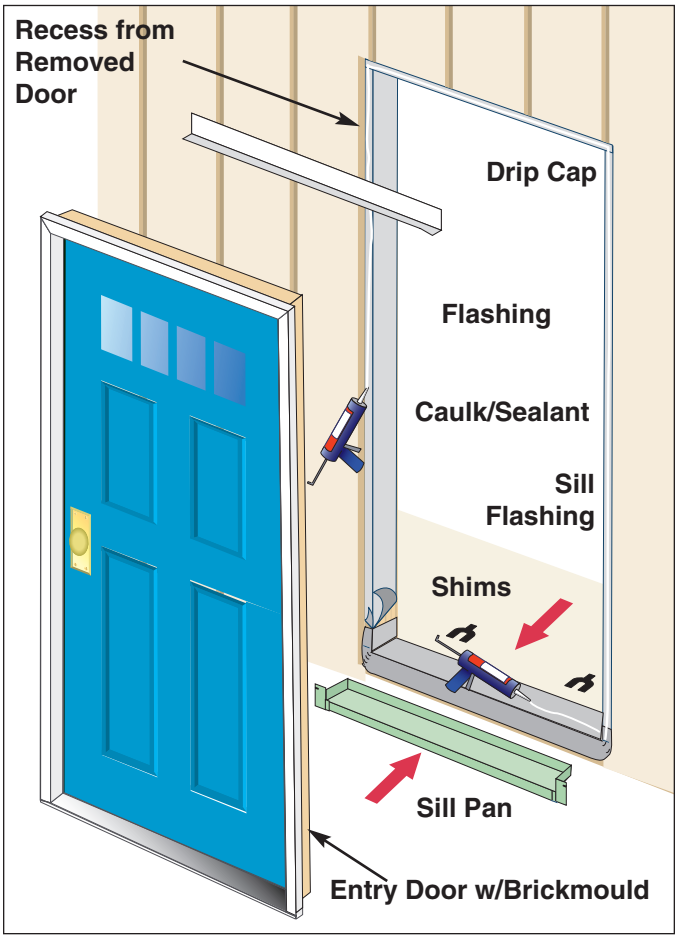
REPLACING ENTRY DOOR

The key to replacing an old door with a new, energy efficient, weather-resistant door is to remove the old door and prepare the opening to be plumb, square, level and with a firm surrounding frame that you can properly mount the new to.

Look through this book at both the window and the door installations to match your wall construction. Once you have determined what the wall construction is, remove the old door as carefully as possible to maintain the integrity of the structural surround and the weather barrier continuity.

When the old door is removed, the proper integration of the 5 Barriers (see elsewhere in this book) has been destroyed and it will be tough to reconnect the comparable barriers in the new door system to the remnants of the same barriers in the wall.

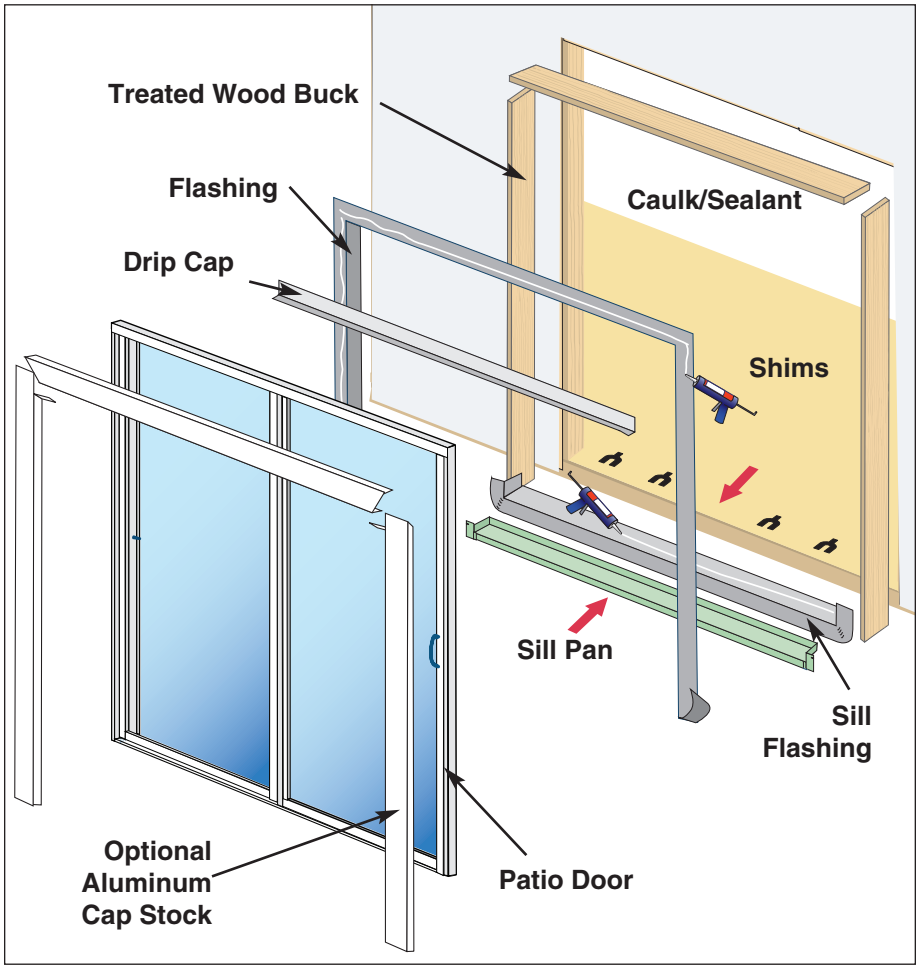
Lastly, old doors often are mounted in openings that have suffered water intrusion. Use impel rods in the frame where water has been and may still reside to prevent mold, mildew, rot and insect damage.



REPLACING PATIO DOOR

Impel Rods are placed into holes drilled in wood at key locations. As the Rods dissolve, the borate preservative migrates to areas of highest moisture and concentrates where wood is most susceptible to decay. If the wood dries the Rods stop diffusing. The residual preservative remains in place. When the moisture content rises the Rods resume diffusion. Depending upon conditions of moisture, Impel Rods need not be replaced for years. A chart included in each package that shows recommended rods sizes and spacing for each type of installation. There are three easy steps to installing Impel Rods:

1. Drill appropriate sized holes to accommodate the predetermined number and size of Impel Rods required.
2. Insert the suitable size and number of Impel Rods into the holes.
3. Seal the holes with treated wooden dowel, wood filler (like wood putty or caulk). Paint if desired.



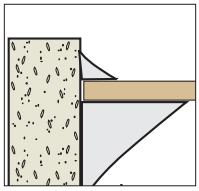
Picking the Proper Sealant

AWDI understands that the application of a sealant is as crucial as the choice of sealant. When a bead of sealant is applied to a joint there are severable factors to consider:

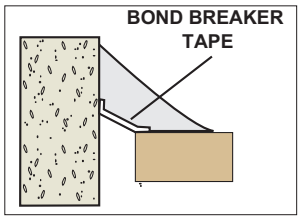
- Adhesion
- Flexibility
- Durability
- Compatibility
- Temp, Weather, Exposure)
- Aesthetics

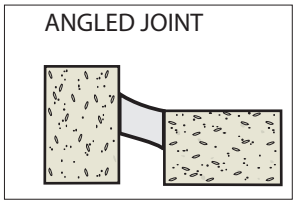
Within these three performance aspects there are countless combinations of applications, substrates and conditions a sealant is exposed to.

Bedding Joints:
For bedding joints, it is especially important that the sealant meet AAMA 800-802, and is of the right consistency and made up of 100% solids so it will not shrink after cure, unlike solvent and latex based sealants that shrink and create gaps after curing.

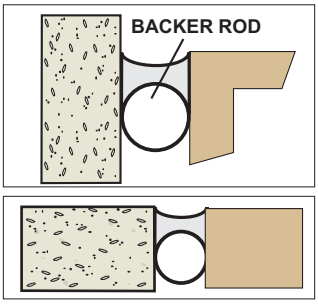


Fillet Joints:
A fillet joint is formed when two surfaces come together to form a right angle. The sealant used to join these two surfaces is triangular in shape. The sealant must adhere to the variety of substrates you're faced with. Without strong adhesion there is a high chance that the sealant will pull away from the substrate allowing for air and water infiltration.





Control Joints:
A control joint is formed when two similar or dissimilar materials meet or when substrates do not form a right angle. This joint will require both a backer rod and sealant for proper application. This joint can be as wide as 5/8 inch and be prone to extreme movement, a highly flexible sealant is necessary for a reliable seal with this application. In order to successfully install a window or door and effect a lasting weathertight seal, AWDI recommends an ASTM C920, Class 50 sealant such as premium DYNAFLEX® from DAP as a good representative to seal the exterior joints of windows and exterior finish materials. The best choice is a sealant that meets AAMA 800-802 to assure proper adhesion to the most common building materials and that is compatible with WRB and flashing tapes; and can be ued in a wide temperature range and wet surfaces.



Desired Properties

- No Shrinkage
- Locks out air and water infiltration to protect integrity of the seal
- Proven Wet Surface Application
- Ability to use the same sealant in warm and cold temperature situations to produce consistent results. 0F – 140F cold and warm weather application
- Strong Adhesion / All Surfaces Will stick to even the most difficult to bond building materials
- 5X stretch, 50% joint movement Long term durability assurance even with expansion and contraction of building materials
- 24 hour fast cure, paintable 1 HR. Fast cure to protect the building structure from outside forces and quick paintability saves time
- Achieves bubbling resistance faster to ensure optimal aesthetics
- 4,600 + Color Matches ensures perfect color match to all primary building materials
- Dirt & Dust Resistance ensures optimal visual appeal long after an installation
- UV Resistance
- Long term durability to compliment the durability of the building structure

Spray Foam Insulation

While the term “Spray Foam” is often widely used in construction, there are two different types and each has its advantages and disadvantage.

Spray foam has been shunned by window installers and manufacturers over the years because foams, in the past, have either continued to expand after trim has been applied deforming the more pliable vinyl window frames, or because they have been over used to fill the gaps left when old windows are removed and the underlying rough opening has been exposed.

Make sure the foam you use has been tested in accordance with AAMA 812 and meets standard for low pressure development.

Most standards applying to window installation do not delineate between open cell foam and closed cell foam, the more popular “minimal expansion” foams are most frequently used and they are mostly closed cell. More confusing yet, is when foams are recommended, the compressed foam tape alternatives are called out to be open cell.

When it comes to Spray Foams, it helps to understand the differences.Open-cell spray foam (ocSPF) has a cell structure where the cells are filled with air. The open-cell structure renders soft, flexible foam, with a density of about 0.5-0.8 pounds per cubic foot (pcf).

The R-value per inch of open-cell foam typically ranges from R3.6 to R4.5 per inch. Unlike fiberglass and cellulose, the fine cell structure of ocSPF makes it air-impermeable at certain thicknesses. The air-impermeability of ocSPF qualifies it as an air-barrier material, dramatically reducing air leakage through the building envelope, significantly lowering the building’s heating and cooling costs. However, ocSPF, like fiberglass and cellulose insulations, is moisture-permeable, and may require the installation of a vapor retarder in colder climates.

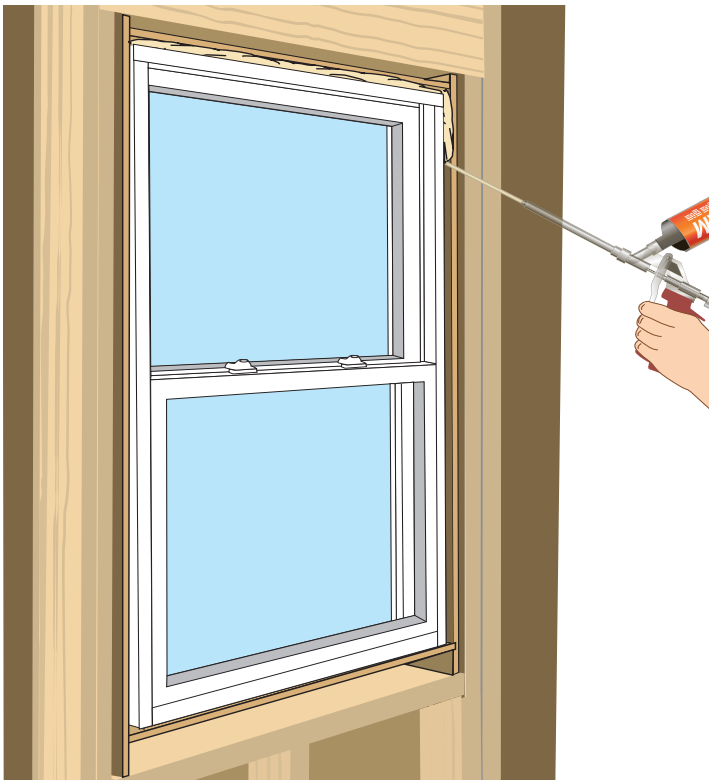
Closed-cell spray foam (ccSPF) has a closed cell structure which yields rigid hard foam, with a density of 1.8-2.3 pound per cubic foot (pcf), and can provide structural enhancement in certain framed buildings. The smaller cells trap insulating gas from the curing, which has a lower thermal conductivity than still air, and increases the R-value to anywhere from R5.8 to R6.9 per inch.

Like ocSPF, ccSPF is also air impermeable at certain thicknesses and can qualify as an air-barrier material. The bigger benefit is that the closed-cell structure of ccSPF also makes it water-resistant, and is the only spray foam that can be used where contact with water is likely.

At a thickness of 1.5 inches, no additional vapor retarder is required for most applications.

Desired Properties

- Make sure the foam used has been tested in accordance with AAMA 812 and meets standard for low pressure development.
- Quick Setting Formulation: can be cut or trimmed in less than 1 hour
- Cold Temperature Application: can be applied in temperatures as low as 14F
- Insulation Value of R5: makes it an efficient method for stopping air and moisture infiltration
- Remains Flexible Once Cured: will not crack or dry out



Using Spray Foam

For the best installation, it is necessary for the gap around the window or door to be sealed to block out air, water and vapor penetration. ccSPF can do that well if selected and used properly. Improper use can create water traps, impede drainage and exert excessive pressure to the window frame during expansion.

Remember: Vapor barriers need to applied on the warm side of the opening. Double vapor barriers (one on the warm side and another on the cool side) encourage condensation between and will trap the resulting condensation. Also, window installation cavities (the space between the window frame and the rough opening, or left-in-place old window frame) need to "breathe" to the outside, and allow drainage of collected water to the outside.

Used wisely, ccSPF can be the best solution. AWDI recommends DAP® DRAFTSTOP 812 Window and Door foam. DAP® DRAFTSTOP 812 also achieves a thermal performance of R-5 per inch.

Application

DAP DRAFTSTOP Foam is applied using a Foam Applicator Gun. This foam and gun combination allows for more precise application than the straw grade foam alternative. This gun offers a rear valve used to control the size of bead applied into the openings. The valve also allows the life of the foam to be extended by closing the opening of the barrel for future use.

For even smaller openings, a detachable screw on top is included with the gun to be able to fill gaps as small as ¼" wide.

Important tips:

• Similar to the sealant gun, it is critical that you balance the movement of the foam gun or straw barrel and how you dispense the foam so that the foam makes contact with both the rough or existing window frame and replacement window frame.

• If the dispensed foam does not make contact with both the rough frame and the window frame, there won't be an adequate bond to seal out water and air.

• Industry Standards suggest application of 1 inch beads, separated by an equal space. Be careful not to create two vapor barriers - one at the exterior and one at the interior. Make sure there is the ability for the opening to breathe to the cold side for drying and drainage. Use backer rod about one inch in the sill as a stop to make a workable back dam

• When applying foam around the perimeter of the window or door, you must maintain a minimum depth of 1 inch. This depth is required to provide the correct thermal performance, to help improve energy savings, and to protect against condensation problems.

• When applying foam as a back dam to the gap between the window frame and the rough sill, do not allow the foam to extend to the exterior edge of the opening. Maintain a minimum of a 1 inch gap between the foam and the exterior edge of the rough sill. If foam fills this gap at the sill, any water from leakage will not be able to drain to the drainage plane or exterior cladding surface. Place backer rod the length of the sill, 1" from edge and use it as a back dam guide.