

Installing Vinyl-Clad Windows

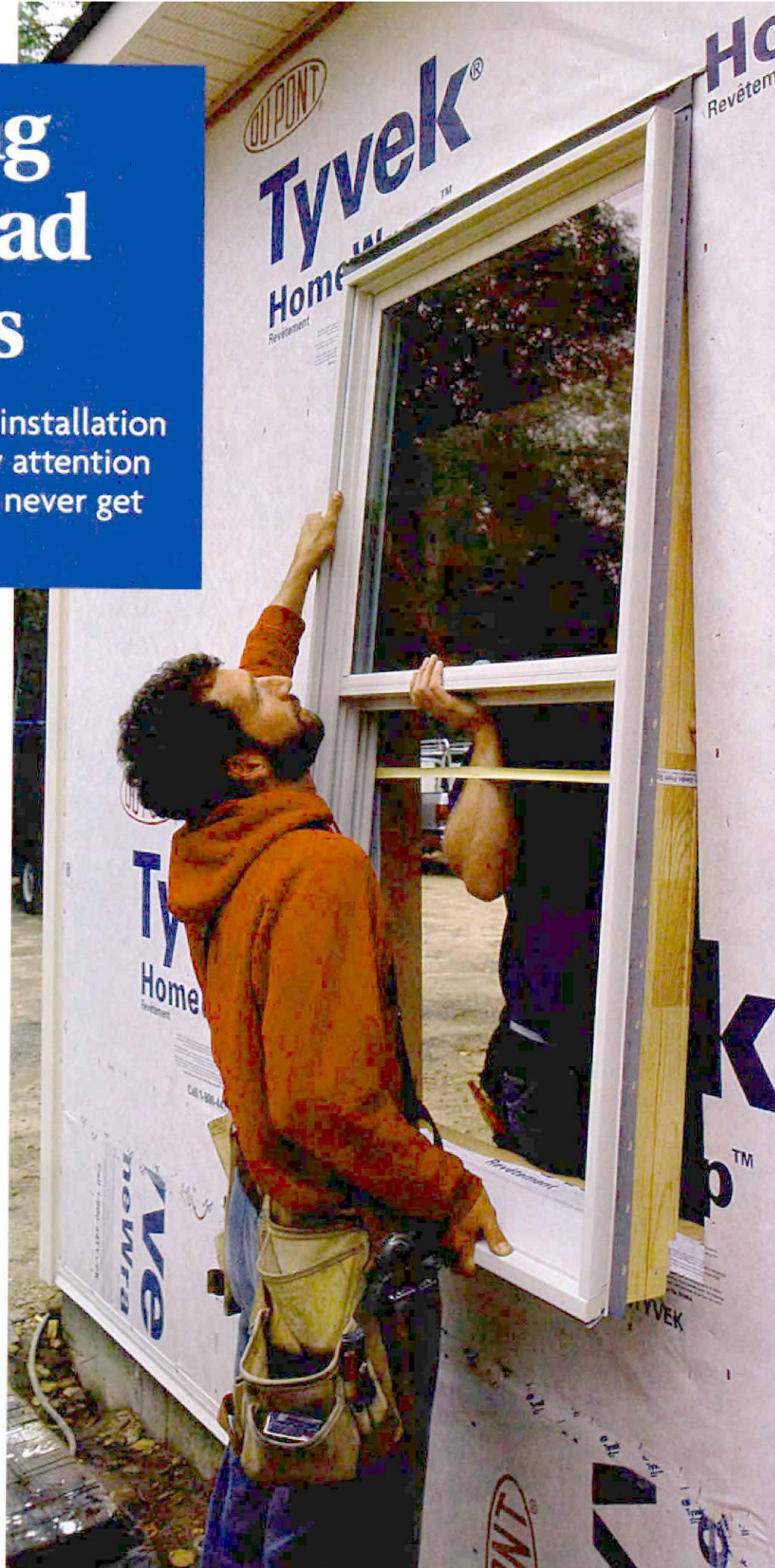
A nailing flange makes installation quick and easy; but pay attention to the details, or you'll never get the windows open

BY RICK ARNOLD AND MIKE GUERTIN



Make way for the flanges. When the window opening is cut in the housewrap, 2-in. slits are made beside the opening for the window flanges to slide through.

Head flange slips under the housewrap. As the window is lifted into position, the outside crew member guides the head flange under the housewrap at the top of the opening.



There are many milestones during a home-building project: first tree to fall, first scoop of earth, final roof rafter set, etc. But one of our favorites is window-installation day. For us, it's usually the day the bank designates the house as a "weathertight shell" and then issues the corresponding check. But even with that added incentive, we never rush the process of installing windows. The last thing a builder needs is a callback to fix a leaky window.

Check the flanges before installation

The windows we install most often are vinyl clad, meaning they have a wooden frame wrapped with a protective layer of vinyl (for more on windows, see *FHB* #97, pp. 56-61). Depending on the manufacturer and on the type of window, vinyl-clad windows have either an integral flange that is part of the extrusion covering the wood frame of the window or a flange that friction-fits into a slot on the head and sides of the window frame. The vinyl-clad double-hung windows we installed on this project were the slotted type.

The windows may be shipped without the flanges attached, or the flanges may have come loose during shipping. So we check all the windows to make sure the flanges are attached properly before we begin installation. To reattach the flanges, we first press them into the slot by hand. Once they're in position, we drive them home using a 1x block set against the inward lip of the flange to cushion our hammer blows.

Flanges tuck under the housewrap

We usually start thinking about window installation before the excavator takes his first scoop of earth for the foundation. As the windows are chosen for each location in the house, model numbers and rough-opening sizes are noted. All these numbers are double-checked as the house is being framed.

When we install the housewrap, we now cut the window openings slightly differently than we described in our article on installing housewrap (*FHB* #107, pp. 44-49). Since that article, we have begun using housewrap as a secondary drainage plane. So instead of cutting in diagonally from the upper corners, we cut straight across the top of the opening.

The bottom and sides of the housewrap are cut and stapled into the sides of the framed opening in the usual fashion. But we leave the top loose with no staples for at least 2 in. above the opening where the head flange of the window tucks under the wrap. Next, we extend the top cut about 2 in. out from the opening on each side for the side flanges to



Center the window first. The outside crew member holds the window in place while the window is centered in its opening from the inside.



Two sides of window installation. A level is held outside on the head of the window (photo above), and instructions are given to the inside crew member to shim the window as needed (photo left).



Top corners are first to be nailed. When the window is centered and the head is leveled, the nails are driven in the top corners to hold the top of the window in place.



Plumb jamb. No, not a breakfast spread. The inside crew member moves the window side to side with a flat bar as instructed by the outside crew member who holds a level against the jambs.



Check for square before nailing off the bottom corners. A measuring tape is stretched from corner to corner, and diagonal measurements are taken to make sure the window is square in its opening.

slide through (photo left, p. 64). As the housewrap is cut and stapled to the opening, we also check for protruding nails or anything else that could interfere with installation.

Two crew members make installation easier

We've found that the quickest, safest way to install windows is with two crew members, one inside and one outside the house. Inside duties include handing the window out the opening, centering it and adjusting it in the opening as the crew member on the outside directs. The outside crew member levels, plumbs and squares the window, and then fastens it to the wall.

Before lifting a window into position, we like to unlock and raise the lower sash to give us a better handhold. The crew member on the inside then passes the window unit out through the opening top first, angling it slightly to clear the opening. Having both sash up makes the unit top-heavy, so we take extra care handling it.

As the window is lifted into the rough opening, the outside crew member tips the top toward the house and guides the head flange under the housewrap with the side flanges passing through the two slits made earlier (photo right, p. 64). Once the head flange is under the wrap, the window is lifted up and in. For the lift, the inside crew member, who must be on sure footing, is re-

sponsible for the weight of the window, while the outside crew member balances it and guides it into position.

Don't let go of that window

Once the bottom of the window is pulled into the opening and is resting on the rough sill, the inside crew member hands the level out and gets ready to adjust the window in the opening. The weight of the window makes it want to fall out the opening, so whenever one of the crew members needs to release his hold to grab a tool or to make an adjustment, he lets his partner know. That way, the window is never left unsupported.

At this point, the inside crew member centers the window side to side in the opening with a flat bar (top photo, p. 65). The outside crew member then sets the level on top of the window (center photo, p. 65) and directs the crew member inside to lift the low side with the flat bar until the unit is level. A shim shingle is then slipped between the bottom of the jamb and the rough sill to keep the window level until the outside can be nailed at the tops of the side flanges (bottom photo, p. 65).

Every window we've installed has called for either 1¼-in. or 2-in. galvanized roofing nails or other broad-head nails to be used as fasteners. After the upper corners of the side flanges have been nailed (photo left), we recheck the level to make sure nothing drifted.

We intentionally avoid nailing the top flange at this point because with its friction fit into the head jamb, the flange could pull out while we're adjusting the sides for plumb in the next operation. Windows with integral flanges can be nailed at the top left and right corners without a problem.

Get the sides plumb and square

Next, the inside crew member adjusts the bottom of the window side to side with a flat bar, while outside, a level is held against the window jamb (center photo).

When the jamb reads plumb, the outside crew member drives a single nail at the bottom of the side flange without driving the nail home. The other jamb is then checked for plumb, and another nail is driven to secure the last corner of the window.

Before driving the two bottom nails home, we measure the window diagonally from corner to corner to make sure it's square (photo right). Leveling the top and plumbing the sides of the window should make it square, but the diagonal measurements are the best confirmation that the window is square. Once we're satisfied, we set the bottom nails.

We straighten the side jambs by using a straightedge (photo left, facing page) or by checking the reveal between the sash and the jamb by eye. The middles of the jambs are often bowed in or out and have to be straight for the window to slide in the jamb easily



A straightedge ensures smooth window operation. After the corners of the window are nailed in, a straightedge is placed against the jamb (photo left), and a nail is driven to hold the jamb straight (photo below). A straight jamb is essential for the sash to slide up and down properly.





Nailing off the flanges. After all the windows in the house have been tacked into place, a crew member comes back around to nail off the flanges. Nails for the head flange are driven under the housewrap.

Tape air-seals the window. As a final measure, the flanges are taped to the housewrap. At the head of the window (photo top right), the housewrap is taped to the window flange. The flexible flange at the bottom of the window is taped to the housewrap (photo bottom right).



without being loose. After the jambs are straightened and secured with a nail (photo right, p. 67), the inside crew member checks the sash operation, then lowers and locks the bottom sash and checks the margins.

By the way, some window companies ship their windows with a plastic strap to keep the jambs from spreading during installation. We leave those straps in place until the jambs are shimmed and insulated.

Don't skimp on the nails

The process to this point takes about ten minutes. Finishing installation typically takes another ten minutes. But rather than have the inside crew member waiting around all that time, both crew members usually move on to the next window until all the windows are secured in place. Then one or both crew members can nail off all the windows.

All the window brands we use have nail holes prepunched in the flanges. The recommended nail spacing varies, so we check each manufacturer's instructions before nailing off. This brand calls for nails every 6 in. to 8 in. Their holes are punched at 4 in. apart, so we drive nails at every other hole.

When nailing off the head flange, we lift the flap of housewrap rather than nailing through it (photo left). We always take special care when nailing off vinyl flanges, especially in cold weather when they can become brittle and crack easily.

On occasion, we've tried speeding up the nailing process by using pneumatic coil-roofing nailers. We're usually pretty good at hitting the prepunched holes. But missing with the pneumatic nailer can cause flange cracks, so we prefer to spend the extra time hand-nailing the flanges.

Most window manufacturers wrap flanges all the way around their windows. However, this brand has a soft, flexible flap at the bottom rather than a rigid flange. We tack down this flap with a couple of staples.

Housewrap tape seals the windows

Window installation isn't complete until we've taped the window flanges to the housewrap. Taping the flanges helps to prevent rainwater from entering the wall cavity, and it draftproofs the building envelope.

We first tape the sides where the flanges are on top of the housewrap. We extend the tape beyond the slits that we made for the top flange and then run tape across the head of the window where the flange is underneath the housewrap (photo top right).

In the past, we've treated the bottom flange two different ways. If the installation includes the drainage pan that we use in rough-weather situations (sidebar facing page), then we omit the tape to permit any water that might get behind the window flanges to drain out. But for our standard installation, we tape the bottom flange to the

housewrap to complete the air seal around the window (photo bottom right).

Notes on other flanged windows

Installation of casement and awning-flanged windows is nearly identical to the process we use for double hungs. The biggest difference is that we don't open the windows during handling. With the sash open, they become awkward, and their jambs tend to rack.

Another installation difference is that we boost the window units off the sills with thin ($\frac{3}{16}$ in. to $\frac{1}{4}$ in.) blocks under the corners. These blocks give us space between the unit and rough framing at the bottom to spray in air-sealing foam later. Other than that, the processes are identical. □

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Installing windows for rough weather

Here in Rhode Island, ocean-front properties are in big demand, so we regularly find ourselves working within a stone's throw of the ocean. During the frequent storms that buffet the coast, rain rarely falls down from the sky: It blows in sideways.

In this environment, standard weatherproofing details do little more than channel wind-driven water into building assemblies. And leaks are most likely to occur around the windows.

The first thing we learned is to stop relying on caulk. Sun, wind and water all conspire to penetrate even 50-year sealants in just a few months. Instead, we assume that wind-driven water will find its way in, despite our best efforts. Our strategy, then, is to make sure any water that makes it past our defenses is directed back to the outside.

SLOPE THE ROUGH SILL

The details to redirect leaks occur before the windows arrive. First, we oversize the rough-opening height by $\frac{1}{4}$ in. during framing and install housewrap as we do for a standard installation.

At the bottom of the opening, we install a piece of 6-in. wide clapboard with the thick edge toward the inside of the wall (photo 1). The clapboard gives us a sill with a slight pitch.

We make the window drainage pan of adhesive-backed bituminous membrane (photo 2). We cut a 9-in. wide strip of membrane about a foot longer than the width of the opening. The membrane is pressed onto the clapboard,

with 6 in. or so of membrane run up the inside of each jack stud.

Next, we make a diagonal cut in the membrane starting $\frac{1}{2}$ in. out from the bottom corners to create two flaps. But before we fold the flaps onto the walls, we press 6-in. by 6-in. pieces of membrane onto the outside wall to span the corners between the membrane flaps. We stick the filler pieces onto the wall so that the pan material overlaps onto them to form a leakproof corner.

The bituminous membrane is pressed tightly into all the corners to prevent a void that could puncture during window installation. On cold days, the membrane may not

stick well to the sheathing or to the housewrap, but a few staples will hold it in place until the adhesive activates.

SEAL THE FLANGES WITH BITUMINOUS MEMBRANE

We install the window as we do in a standard installation except that we slit the housewrap 6 in. at the top corners rather than 2 in. Instead of using tape to seal window to housewrap, we seal the sides of the window to the housewrap with 6-in. wide strips of membrane.

The side strips extend through the slits and then stick to the wall sheathing under the housewrap.

For the head of the window, we slip a 6-in. strip of

membrane under the housewrap (photo 3). The head strip covers the top window flange and extends over the side strips. We let the side strips extend down over the pan flashing. As added insurance, we tape the housewrap to the membrane along the head of the window and out beyond the horizontal slit (photo 4).

The bottom flap is again held in place by the siding so that any water that reaches the pan can drain out. By the way, this window-installation detail works great under vinyl siding. Vinyl siding is leakier than other sidings, so it can use some help to keep water out of walls.

—R.A. and M.G.

