

## Air-Sealing Windows

**Windows are complicated**, big openings in a house that can leak both water and air. This article focuses only on air leaks around windows. Preventing water leaks gets even more complicated. (As an example, the article on page 24 shows one method that works with Zip System sheathing. The methods vary when you use a housewrap and vary further depending on whether the window has a nailing flange or not. For much more, search *JLConline + window flashing*.)

While window flashing is often performed by an advanced installer, air-sealing windows is often a task that builders assign to novice carpenters. That should not be construed as this being a less important task. Both the air barrier and the water barrier are vital to building performance.

The goal in air-sealing windows is to seal the gap between the window rough opening and the window unit. Most *JLC* veterans know they can't do this by stuffing window gaps with fiberglass insulation. That was a seriously flawed, old-school method. These days, you're more likely to be handed a can of closed-cell foam, or a roll of backer rod and a caulk gun.

### WHY WE AIR-SEAL

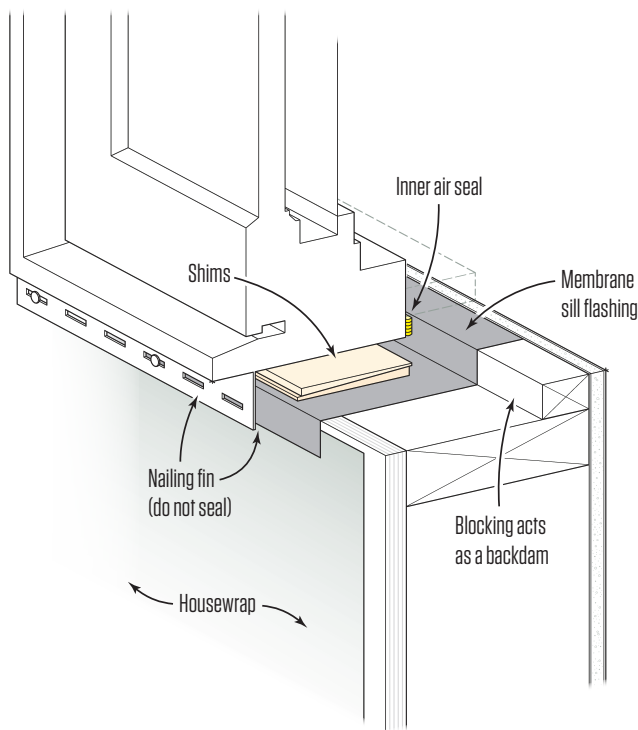
Like any task, air-sealing is best done when we understand why it's important. Here are some principles to keep in mind:

- **Air carries both heat and moisture.** We air-seal buildings to keep conditioned air (warm or cool, depending on the season) inside the home, and to keep unconditioned air outside. Air-sealing also stops moisture-laden air from leaking through the building and condensing onto cold surfaces inside walls.
- **Air is moved by pressure differences.** Wind blowing against a house can push or pull air out through cracks. Fans inside the home can also build up pressure that pushes air through a building enclosure.
- **No gap is too small.** When you seal the gap around a window, you need to remember that any break in the foam or caulk can allow pressurized air to escape. Don't rush the application.

### SEQUENCE OF STEPS

Window air-sealing typically takes place after the window is installed, but there is one exception: If a

### Window Sill Detail



Air-sealing a window is distinctly different from flashing a window. Flashing is done to keep water out. It can't completely stop air because the bottom needs to be left open to allow water to drain out of the assembly. A window's air seal, on the other hand, is typically applied from the interior. The bottom of the window is sealed along the backdam, as shown in the illustration above. This bead of caulk should be applied when the window is installed. As a backup to the inner seal shown above, a fillet of caulk can also be applied in the corner between the blocking used as a backdam and the window unit, as shown in the photos on the next page.

Illustration by Tim Healey

## Training the Trades

backdam is used, it's best to apply a bead of caulk along the outer face of the backdam while the window is being installed (see "Window Sill Detail," previous page).

Instead of a backdam, some builders may use a piece of beveled siding on the rough sill. The bevel slopes to the outside and helps drain away water that might leak through the window. In either case, there is not enough room to seal the inside with foam; the bottom must be caulked tight instead.

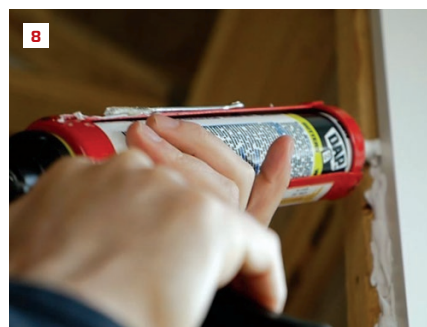
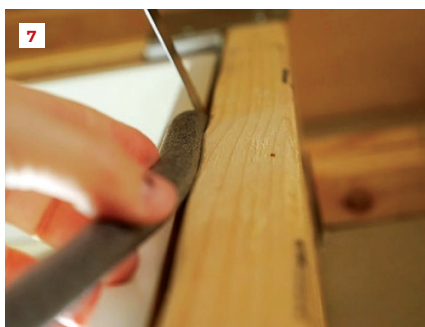
The photos that follow show the steps to sealing a window with foam sealant. As an alternative to foam, you can also use a foam backer rod and caulk, as the last couple of photos demonstrate.



Start with good tools. A professional-grade caulk gun and foam gun (not a plastic straw) provide needed control **(1)**. On this window, foam is applied on both sides and across the head. The carpenter started at the upper right corner and pulled a bead down the right side of the window **(2)**.



After completing the right side, the carpenter returns to the upper right-hand corner **(3)** and pulls a bead across the window head **(4)**. Note that jamb extensions have not yet been installed, and the carpenter has inserted the gun's tip deep into the gap, so the cavity fills from the back forward as the foam expands. Finally, the carpenter turns the corner and works down the left side **(5)**.



Complete the air seal by caulking in the corner between the backdam and the window **(6)**. Caulk can also be used to seal the wide gap at the sides and head of the window. Many builders prefer a more flexible seal, but in order to make caulk work, the gap must be filled with a foam backer rod first **(7)**. Backer rod allows you to apply a thinner bead of caulk **(8)** that will remain flexible.

Photos: 1-6, Tim Healey; 7 & 8, Matt Rinsinger

 For a more detailed discussion on air-sealing windows, go to [www.jlconline.com/training-the-trades/airsealing-windows](http://www.jlconline.com/training-the-trades/airsealing-windows).