# Choosing Replacement Windows

*Though not for everyone, wood and vinyl sash replacements are a cost-effective alternative for many older homes*

**by Charles Wardell**

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In the Northeast, where I live, there are lots of older homes with inefficient oil furnaces and drafty, double-hung windows. That makes replacement windows a big business. However, the words "replacement window" mean different things to different people. What most people think of as replacement windows are sash replacements that fit into existing jambs. But there are various other types marketed as replacements, some of them indistinguishable from windows for new construction.

To sort through the confusion, I spoke with dozens of contractors, suppliers, and manufacturers. I had several conversations with distributors during which I concluded that they carried the type of window I wanted. But when I finally received their literature, I realized that the product didn't match up with my expectations. The literature didn't always clear things up, because brochures tend to emphasize glass performance at the expense of everything else.

I eventually learned that asking specific questions about window performance usually got me to someone who knew the product. Then, asking for step-by-step installation instructions gave me an accurate picture of the type of window we were talking about.

### The Choices

The most popular sash replacements are one-piece *replacement units*, sometimes wood but usually vinyl. They typically include new sash enclosed by a vinyl frame, and are designed to slip into the jamb of an existing window (see Figure 1). The other alternative is a *sash-only kit*. It consists of wood sash and a pair of vinyl jamb liners that are fastened to the old jamb. Although replacement units are available in several styles, including casements and awnings, most are double-hung, as are all sash-only kits. Both types are designed to tilt in for cleaning.

In most cases, replacement windows are simple to install — you remove the old sash and a few pieces of trim but leave everything else alone. And though prices vary, they're usually lower than for new-construction windows. One local supplier quoted me prices of $130 to $150 for vinyl replacement units, $170 to $190 for the sash-only kits, and $200 or more for good quality new-construction windows. But the real savings is on installation time. The contractors I know who have used these products claim that they can complete a window in less than an hour from inside the house. One quoted me an installed price of $190 to $240 each for the replacement units. On a sizable job, that can provide a respectable profit while still giving the homeowner a hefty savings over new windows.

### Vinyl Pros and Cons

People buy vinyl windows for the same reasons they buy vinyl siding: vinyl costs less than wood and is easier to maintain. So it's not surprising that even though a few companies sell wood replacement units, the vast majority are vinyl. Vinyl windows never have to be painted, are easier to operate than most wooden sash, and don't swell with changes in humidity.

One oft-cited complaint about vinyl units is their looks. A vinyl replacement unit usually looks different than the original wood window. Rails, muntins, and other elements are typically square-edged rather than profiled. And the vinyl frame creates an extra band around the sash that reduces glass size by a couple of inches. Those may or may not be issues, however, depending on your customer's taste. On windows that are habitually covered by drapes or blinds, for instance, a smaller glass size might not be noticeable. And because the interiors of many older homes have been modernized, the replacement's stark profile might not seem out of place from within the house.

The fact that a window has been replaced is often more noticeable from the outside, so the severity of the problem depends in part on the home's architectural style. Although you probably wouldn't install vinyl replacements in a traditional Victorian facade, they are usually perfectly acceptable for the average home.

### Evaluating Replacement Units

At first glance, it's hard to tell one vinyl unit from another. All are assembled from hollow extrusions of polyvinyl chloride (PVC), most of which are made by the same few extruders. One sign of a company's confidence in its product is the warranty. Insulated glass should be warranted for ten years, vinyl for the life of the window. Other qualities to consider are the thickness and geometry of the extrusions, the way they're put together, and the in-place performance of the window.

***Vinyl quality.*** High-quality windows use thicker extrusions (2 mm or more), making them less likely to warp or sag. A good frame will also include chambers or hollows to add stiffness and insulating value, and to absorb temperature movement (see Figure 2). "The more hollows you have, the stronger the extrusion," says Bob Sullivan, a manager at Harvey Industries in Woburn, Mass., a large regional distributor of aluminum and vinyl building materials. Big windows should have aluminum or steel reinforcement bars added to their horizontal members to keep them from sagging. Sullivan cautions that you should never buy unreinforced units more than 36 inches wide.

Regardless of thickness, all vinyl is sensitive to heat. On a hot summer day, a dark-colored window can get warm enough to warp or bend if any pressure is applied to it. Because of this, most windows are available in just a few standard colors, usually light browns and whites. You may be able to find darker shades if you shop around, but avoid them in hot climates. And don't store a vinyl window in the sun or lift it by its head jamb — it could deform.

***Workmanship.*** Take a close look at the details used in the sash and frame. Exposed screws and sloppy weatherstripping make a window seem cheap, even if it's not. Corners


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**Figure 1.** *Sash-only replacement kits (left) include wood sash and vinyl jamb liners. Vinyl replacement units (right) typically have a vinyl frame around the jamb, making the replacement sash somewhat smaller.*


VINYL BLDG. PRODUCTS

**Figure 2.** *Hollows and chambers in the extrusions give strength to vinyl windows.*

make an impression, too. Sash and frame extrusions may be joined with thermal welds or held together with screws and other fasteners. Although there are plenty of good-quality, mechanically fastened frames on the market, welded frames are stronger. (Some welded frames can withstand up to 5,000 pounds of pressure, but that's less important than it seems since a properly-installed window should support no weight at all.)

***Energy issues***. Most people buy replacement windows because they want to lower their heating bills. One advantage to replacement units is that they come with measured efficiency standards. For each different unit, your supplier should be able to provide technical data on glazing types, R-values, air leakage rates, and whether or not the window passed a water leakage test. It's best if these tests are performed by an independent laboratory on a random basis. And while you're at it, find out what the R-value calculations represent. Although most manufacturers use the 1989 ASHRAE method, which takes the insulating value of the frame into account, some may still use the older, center-of-glass method that yields inflated R-values.

The most important number is the air leakage rate around the window's crack perimeter (that's the space between the sash and the jamb). Air leakage is measured in cubic feet per minute per crack foot with a 25-mile-per-hour wind blowing directly at the window. An average rating for a wood tilt window is around .15 cfm, while Harvey's double-hung vinyl replacement unit gets a rating of .06 cfm — typical for a good quality vinyl unit. The reason? The vinyl unit includes 14 pieces of weatherstripping. Most wood windows have only three or four.

## Installing a Vinyl Unit

Installing a vinyl replacement unit is a three-step process of removing interior trim pieces, fastening the unit in place, then retrimming the inside edge.

On sash-weighted windows, remove the three inside trim pieces (they're usually screwed in place) the lower sash, the parting stops, the outer sash, and the sash weights and pulleys, in that order (see Figure 3). If you want to insulate the sash weight cavity, you can try stuffing insulation through the pulley holes and the cavity access doors, but you'll probably end up with large gaps. Also, you won't be able to insulate above the head jamb or below the window sill. Another option is simply to install the unit without trying to insulate the cavities. If the window is still drafty afterward, you can remove the casings and insulate behind them.

Before inserting the unit, run a heavy bead of caulking along the inside face of the blindstops. Next center the unit in the opening and seat it securely against the blind stops. Then drive screws through the predrilled holes in the vinyl jamb. You may need to add some shims to an out-of-square opening, but save your most careful shimming for the sill — a vinyl frame must sit on a *level and continuous* base. Otherwise it will sag and bind. The easiest way to level the base is with a shimmed-up strip of 1/4-inch plywood.

Around here, most vinyl windows are designed to fit a frame width of 3 1/4 inches — the distance between

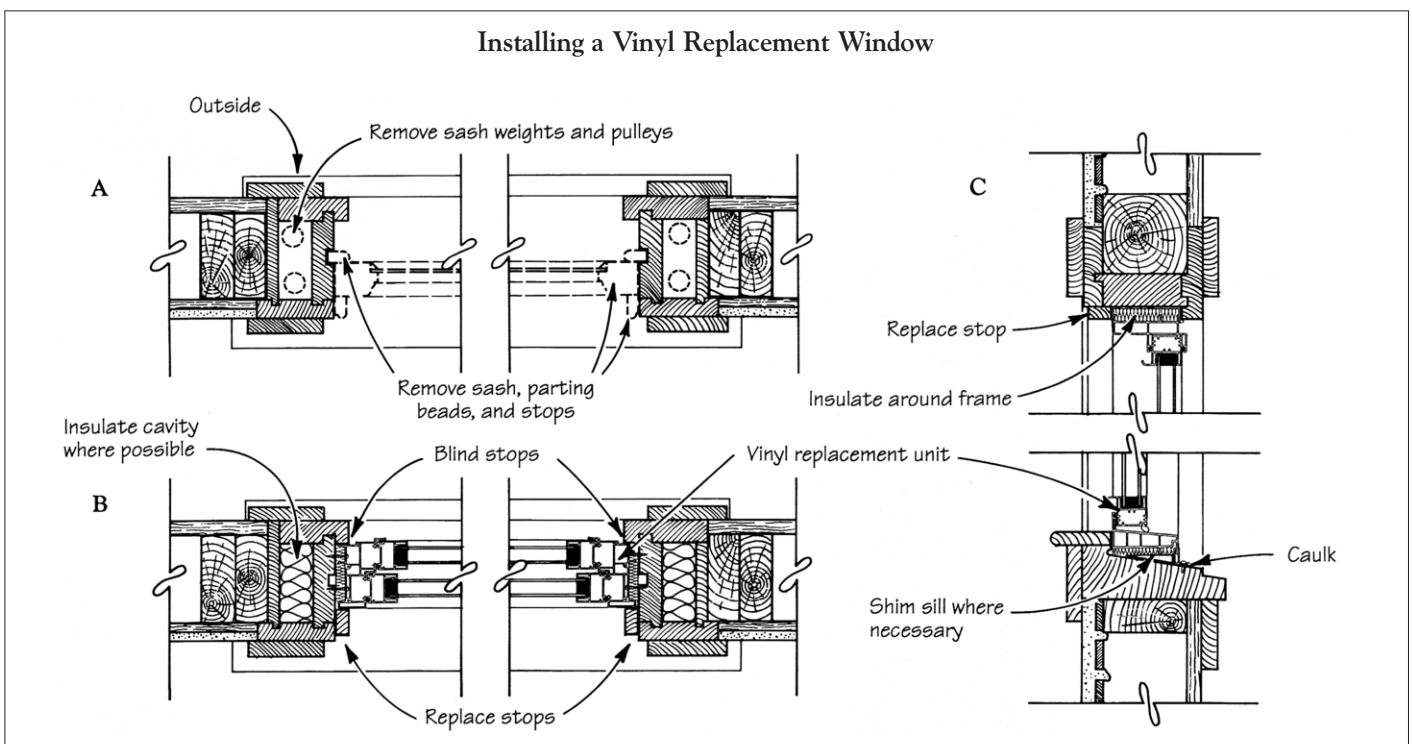


**Figure 3.** *Installing a vinyl replacement unit requires removing the interior stop, the sash, and the parting bead (A). The installed unit sits tight against the exterior blind stops (B). If necessary, shim the sill so the unit is level (C). Reinstalling the interior stop finishes the job — usually in less than an hour.*

the outside blind stop and the inside trim of a typical old double-hung window. Odd-width jambs must be adjusted on the site. You can compensate for a wide jamb by nailing strips of wood to the inside edges of the blind stops. For narrower jambs, you'll have to remove the stool cap, and rip both it and the inside trim pieces before replacing them.

The next step is to insulate the small gap between the vinyl frame and the existing jamb. Some windows come with a self-adhering, closed-cell foam tape that's made just for this purpose. It's wrapped around the window before installation. Some installers prefer 6-inch fiberglass pipe insulation; it comes in 50-foot rolls and is stuffed into the gap with a putty knife. Others use nonexpansive foam or urethane backer rod. Never use expansive foam, however: it can bend the frame and bind the sash.

### Wood Sash-Only Kits

A sash-only kit is basically the guts of a regular double-hung window unit. A pair of 3 1/2-inch-wide vinyl jamb liners with a spring-loaded block and tackle system are fastened to the old jamb. The wood sash are then installed between the liners. For people who want to preserve the original look of the window or who don't like vinyl, these may be a good choice.

When comparing sash-only kits, ask the same questions that you would of any wood window: What kind of joinery does the manufacturer use? Does the window offer a true-divided-light, and at how much of a premium? Some companies put a vinyl mullion on the outside and provide a snap-in grille for the inside. The window looks like a true-divided-light from the street but costs a lot less. And then there's the finish. Some wood windows come with a high-performance polymer finish, in a variety of colors, that's supposed to last ten years or more. Other wood sash are clad in vinyl or metal.

***Wood disadvantages.*** Unfortunately, sash-only kits have some disadvantages compared to vinyl units. For one thing, the existing jamb can't have any rot; if it does you won't be able to fasten the jamb liners or get a tight seal. You can install jamb liners in a slightly crooked jamb, but not in one that's very out-of-square. And the vertical jambs *must* be parallel. Otherwise the window will either bind or leak air.

These variables make sash-only kits harder to install correctly than replacement units. "You really should have an experienced carpenter install them," says Jim Carney of JB Sash and Door in Chelsea, Mass., a company that sells sash-only kits and replacement units. Carney, for example, has seen instances where an installer "fixed" a pair of unaligned meeting rails by putting a shim beneath the window latch. Unfortunately, this also prevents the window from sealing. Someone familiar with window operation would have planed the top edge of the upper sash or the bottom edge of the bottom sash.

The wood sash in a sash-only kit is also harder to tilt in than a vinyl replacement window. Vinyl sash use a latch mechanism, while wood ones rely on friction. Some companies claim that they'll eventually offer the same latch on their wood windows, but the main obstacle is cost. In a wood window, the latching mechanism requires a sash frame that's thicker than the standard one. Manufacturers have been understandably reluctant to duplicate all their standard sizes in a thicker profile just to include this latch.

Of course, there are ways to make even friction-fit windows easier to use. Weather Shield, for example, puts a slight radius on the edges of its sash profiles. The radius makes it easier to tilt the window in.

***Air leakage.*** Performance is harder to predict with a sash-only kit than with a replacement unit. Although the glazings are similar — most use double-pane, low-e glass — airtightness is another matter. Manufacturers won't list airtightness standards because the final result depends on the installer. If properly installed, however, a kit should meet the same air infiltration specs as a new wood tilt window with identical sash and jamb liners. These specs range from .12 to .17 cfm, depending on size: The bigger the window, the closer its performance will be to the higher number.

### Choosing A Supplier

Some well-known national companies make replacement windows. But the replacement market is dominated by local and regional suppliers. If you know a local company with a good reputation, buying your windows there could make a lot of sense. For one thing you'll probably get your order quicker. In my area, vinyl units are usually delivered in two or three weeks; wood sash take somewhat longer. By contrast, some national companies make you wait five or six weeks. And if you live in New England or California, where traditional window sizes differ from the national standard, a local company is more likely to have the size you need in stock.

If you're able to buy directly from a local manufacturer, so much the better. JB Sash and Door, for instance, is basically a custom window and door company, while Harvey makes its own glazings and has its extrusions custom-made to its specifications. Harvey also has its own engineering department. "We do the design work and the extrusions are built to our designs," says Sullivan. "That gives us control over the window." ■

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### Sources of Supply

Below is a partial list of national manufacturers of wood and vinyl replacement windows. You can call these manufacturers for names of local distributors in your area. There are also many smaller, regionally based manufacturers, too numerous to name here. Local manufacturers can often provide high-quality replacement windows in a shorter time.

***Wood Sash-Only Kits:***

Caradco
P.O. Box 920
Rantoul, IL 61866
217/893-4444

Kolbe and Kolbe
1323 S. Eleventh Avenue
Wausau, WI 54401
715/842-5666

Marvin Windows
Box 100
Warroad, MN 56763
800/346-5128

Weather Shield Manuf.
P.O. Box 309
Medford, WI 54451
800/477-6808

***Vinyl Replacement Units:***

Alumax Bldg. Prods.
(western U.S)
P.O. Box 5350
Riverside, CA 92517
800/626-3223

Bird Vinyl Division
1010 Withrow Ct.
Bardstown, KY 40004
800/626-1524

CertainTeed Corp.
Window Division
P.O. Box 860
Valley Forge, PA 19482
800/274-8530

Chelsea Building Products
Customer Service
565 Cedar Way
Oakmont, PA 15139
412/826-8077

Harvey Industries
(New England)
35 Commonwealth Ave.
Woburn, MA 01801
800/882-8945

Milgard Windows
(western U.S.)
P.O. Box 11368
Tacoma, WA 98411
206/922-6030