



## OPENING STYLE

Many people don't realize that you don't have to replace your old windows with new ones that have the same opening style. Air leakage in and around windows is a big factor in the window's overall thermal performance. In terms of air leakage, the best window is fixed; that is, can't open or close. There simply aren't any gaps and openings for air to find its way through.

Fixed windows may be an excellent option in certain locations. Nearly as good are "casements" or awning style windows that crank open and closed. Because the seals are compressed slightly when the window is closed, it is difficult for air leaks to develop.

The least efficient opening style is sliders. Many people select sliders simply because that is what they've always had. There are plenty of good sliders on the market, but they have to rely more on other features, such as LowE coatings (see below), to deliver top energy performance. Sliders, which have more joints and gaps, are also more susceptible to air leaks as the seals age and get worn or lose their resiliency. As much heat can be lost through the frame as through the glazed (glass) portion of the window.

Both wood and vinyl perform well, whereas making a metal frame that doesn't transmit heat or cold well is difficult. Metal frames are generally stronger, which becomes a factor in commercial applications or with extra-large windows and slim frames.

For normal size residential windows, most homeowners choose vinyl or wood.

## FRAME

The frame is key to the long-term structural integrity of the window. If the frame warps or cracks, the window's performance can suffer enormously. With vinyl windows, avoid frames that are held together with screws because they tend to loosen over time. Instead, look for "welded" seams, where either heat or chemicals have been used to fuse the joints. In terms of energy savings, wood and vinyl are comparable. Some people prefer the aesthetics of wood, though it lacks the maintenance-free aspect of vinyl.

## GLAZING

Most older windows are made with a single layer of glass. The most popular replacement windows are made with two panes of glass. Some people opt for triple-pane windows to maximize the improvement in thermal performance. Added layers improve performance.

First, enclosed air and other gases (see "Fill Gases" below) are effective insulators. The more enclosed spaces the window has, the less heat can escape. Each layer of glass also provides more surfaces for LowE coatings. Some windows use a plastic film suspended between two layers of glass (laminated glass) to achieve a triple-pane effect at a lower cost.



## LowE COATINGS

LowE coatings are almost invisible finishes that are usually applied to glass. While they let through most of the light humans can see, they block much of the heat-intensive infrared light, thus improving the window's insulating value. Some windows have the LowE coating on a film suspended between two layers of glass, creating the effect of a triple-glazed product.

## FILL GASES

While plain air is a good insulator, some gases (like argon, krypton and carbon dioxide) are even better. The gas or combination of gases affects the window's overall thermal performance. Argon has become popular, but dissipates over time as do other rare gases.

## NFRC RATING

The National Fenestration Rating Council has developed a rating system that considers nearly all of these factors. One element the NFRC rating system doesn't account for is the long-term durability of the product because it rates the overall window only when it is new.

The NFRC gives each window a U-factor rating. The lower the U-factor the better. The U-factor is the inverse of the more familiar R-factor used in attic insulation.

When comparing windows, check for the NFRC label. Look for the U-factor. The first number after the words "U-factor" is the rating that's appropriate for residential purposes. It will be marked "AA" or "Residential." The U-factor marked "BB" or "Non-Residential" is for commercial window applications. Use the U-factor rating to make meaningful comparisons. Be wary of a window vendor who won't provide this number.

How far should you go? Obviously, you need to get price comparisons to make a decision. Keep in mind that a good portion of your cost is installation, so it makes sense to leverage those costs by installing a better window.

## DURABILITY

What about durability? The NFRC ratings don't address durability directly. If the windows warp, leak or loosen over time, their U-factor ratings are likely to plummet. Your best resource for choosing a durable, problem-free window is to rely on the advice of a reputable installer. He or she will be interested in your long-term satisfaction and will quickly steer you clear of windows that don't hold up well.

You can also inspect the window before buying. Look for a good fit between parts. Slip a business card between any slidable sashes and the frame. The card should slide but there should be some resistance.

Low U-factor ratings and durable construction are both determined by attention to details. In general, the better rated windows will be better made as well.



## SAVING MONEY ON MAINTENANCE

New windows can save you money on maintenance in two important ways. First, if you choose vinyl, all fiberglass or aluminum windows, you can eliminate the cost of painting the windows inside or out. In a typical home or commercial painting project, the most expensive part is painting the windows. Eliminate the need for that and your painting costs will be reduced.

The outside of most modern replacement windows is designed to be cleaned easily from the inside. If you wash your own windows, you'll save yourself a lot of time and eliminate a major safety risk. If you normally hire a pro, you may find you can do it yourself with these practical new windows.

## EASIER TO OPEN AND CLOSE

Many older windows are tough to open or close. We even have customers call us to replace windows because they hurt their back wrestling to open recalcitrant old windows. This is usually caused by springs and weights no longer working to balance the weight of old windows. A new window will operate smoothly with little exertion.

## OPPORTUNITY TO UPGRADE YOUR HOME

When considering replacing windows, recognize that this is an opportunity to improve your home in more observable ways than just lower fuel bills.

Windows can also come with films providing ultraviolet protection so that rugs, drapes, and upholstery are less susceptible to fading. Frosted windows are available to offer more privacy.

There are even windows that go from clear to frosted at the flick of a switch! Many new windows come with better locks and special catches that allow you to leave a window ajar without permitting a burglar to open it far enough to climb through. Windows, especially distinctive ones, add considerably to the resale value of a typical home.



## WHAT TO LOOK FOR IN A WINDOW COMPANY

For a window to actually perform at the levels indicated by the NFRC ratings, it must be installed correctly. The new window must be installed exactly level and must be exactly square in the frame. Any gaps around the window must be carefully filled with insulation. If all this isn't done right, you may be wasting your money.

Therefore, choosing a reliable company to handle the installation is extremely important. A big advantage of buying the window from the company that installs it is that there can be no passing the buck if there are problems. Whether the trouble comes from the window or the installation isn't something you have to worry about since one company is responsible for everything.



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