

Energy Efficient Windows



Overview

If you're replacing your windows to upgrade your home's energy efficiency, you should consider a complete home energy audit and retrofit at the same time. New windows are expensive, and unless you have a tightly sealed and well-insulated house, you may not be getting your money's worth out of your investment.

Are Energy Efficient Windows Right for You?

The first thing that many people think about when trying to make their home more energy efficient is replacing their old, single-paned windows with new, double-paned, triple-paned and/or low-E windows. While this will increase the efficiency and comfort of your home, it's also very expensive compared with other energy efficiency upgrades that will provide as much, if not more, benefit in terms of energy savings, utility bill savings and reduced carbon output. However, if you need to replace your windows anyway, you should definitely do it with high-efficiency windows and take advantage of home improvement financial and tax incentives for them.

If new windows are the right choice for you, there are a few things you should know before you buy, because different climates have different window needs. The efficiency of a window is determined by U-factors in cold climates and Solar Heat Gain Coefficients (SHGC) in warm climates.

Window U-Factor: In a cold climate, you should look for windows with a low U-factor. U-factors are made lower by the low-E coating on the windowpanes, which reduces the transference of heat from one side of the pane to the other. In other words, the low-E coating is going to help keep heat (expensive to produce) inside your home during the winter months. U-factors can be improved even more by purchasing panes filled with argon or krypton gas.

Window SHGC: If you live in a hot and sunny climate, you should look for windows with an SHGC rating of 0.30 or lower as well. This will provide you with a window that is designed to keep solar radiation out of your home. Low-E coatings and gas filled panes also play a role in improving SHGC.

For mixed climates, your best bet is a window with low ratings for both the U-factor and the SHGC. While heat can be transferred easily through low-quality windowpanes, another problem area can be around the glass inside and outside of the frame where air leakage occurs. Air leakage problems can be solved with insulation, caulking and weather stripping, which is something an energy auditor can advise you on.

As we've mentioned above, new windows are expensive, so you'll want to combine this investment with insulation and air sealing for the rest of your house. This way, you'll enjoy the appearance of new windows with the energy saving benefits of reduced heat loss. For more information that will assist you in making smart decisions about this investment, contact an energy auditor who can help.

What Kind of Windows Do You Have?

There are a lot of new and different windows out there, but we'll make it easy for you in determining how energy efficient the different types are. Either they're really old and single pane (and hopefully you've got storm windows for them), they're kind of old and double pane, or they're new (installed after 1990), in which case, they're fine.

Single Pane: We're talking old school windows here. A single pane of glass, set in a wood frame. Nothing fancy. If you're unsure about whether you've got single or double pane windows, you can do a little trick. When it's dark outside, light a match and hold it up to the window pane. If you see a single reflection of the match, you've got single pane windows.

Single with Storm: If you've got single pane windows but you use storm windows in the winter, we've made this special category just for you. It may be a pain to install them each winter and take them out each summer, but it's worthwhile for your utility bills and your home's comfort if you can't afford the major upgrade to modern windows.

Double Pane: Double pane windows made before the 1980s fall into this category. Anything since 1990, even if it's a double pane window, we categorize as being "modern high efficiency." If you know your windows are old but you're not sure if they're single or double pane, you can do the match trick. When it's dark outside, light a match and hold it up to the window pane. If you see two reflections of the match in the glass, you've got double pane windows.

Modern High Efficiency: There are a lot of types of windows being made today and a lot of fancy terms being used to describe them: triple and quadruple pane windows, filled with argon or krypton, with low-E coatings. To make this easy, we're grouping all windows made since around 1990 into the category of modern high efficient. If your windows were installed after 1990, this is your category.

There are certainly performance differences within this category from window to window that will have some impact, but it won't be much of a difference when compared to your overall home's energy efficiency. If you're not sure how old your windows are, the match test will come in handy again. When it's dark outside, light a match and hold it up to the window pane. If you see three reflections of the match in the glass (even if one of them is faint), you've got modern high efficiency windows. If you only see two reflections, then you've got double pane windows.

Don't worry if the seals on some of your windows are broken. It may be difficult to see through, but it doesn't affect the energy efficiency of your windows.

To learn more about window types, ratings, and performance, click [here](#).

How to Use Skylights and Daylighting Efficiently

Today, one of the greenest ways to light any home or building is by using readily available daylight. Studies have shown that compared to electrical light, daylight can actually improve mood, reduce eye fatigue, provide true color rendition, and of course, reduce electrical consumption by reducing the need for electric lighting. Depending where you live in the country, you have 1,500-3,000 hours of available daylight to take advantage of annually. So why waste electricity when the sun is shining?

Modern daylighting systems use optics to capture, transfer and deliver natural light effectively into the home — so you can retrofit your existing house to get daylight into rooms that need it. Advances in plastics can filter out the harmful ultra violet rays, so there is no fading of interior surfaces. And unlike older skylight systems, there's little risk of leakage. This is one of the most dramatic changes you can make in the interior of your home for minimal cost. And the best part is that the sun never sends you a bill at the end of the month.

If you're going to install skylights instead, the best way to incorporate them into the design of your home will depend on your region. If you live in a

cold, northern climate, your best bet is to design your daylighting on the south side of your home. This will allow light to penetrate into your home throughout the winter months. Meanwhile, southern, sunny climate dwellers often choose to place skylights on the north side of their home because it will reduce the amount of heat gain through their windows, while still allowing plenty of light into their homes.

The efficiency of the windows and skylights you choose for your home is also important because without energy-efficient, properly sealed windows, your home could potentially lose and gain heat through and around the windows. This can be avoided with properly installed windows that have low U-factors and low Solar Heat Gain Coefficients (SHGC). A retrofit contractor will be able to help you figure out the best way to incorporate daylighting systems or skylights into your home for more natural lighting and to reduce energy usage from electricity.