

Insulated Windows

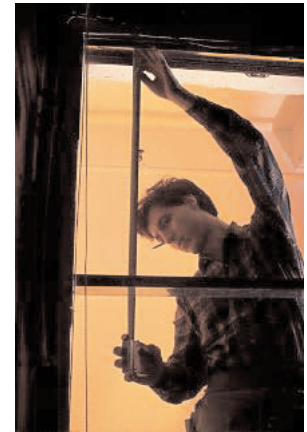
Storm Windows

Poor fitting, single-pane windows can lose energy much faster than modern multi-glazed low-e windows. In extreme weather, such a poor performing window may lose energy ten times faster than an equal area of wall. On clear summer days, an unshaded window adds greatly to undesirable solar heat gain. In many homes, heat loss and gain through and around windows accounts for more than 25% of a home's heating and cooling bills.

The best way to improve your home's energy efficiency is to replace old windows with modern, double or triple-glazed, low-e new or replacement windows. Look for Energy Star® labeled windows, as the EnergyStar label indicates that these windows are particularly energy-efficient and cost effective for your climate. However, for people with tight budgets, a less expensive option is to use storm windows. Even though storm windows add little to the insulating performance of single-glazed windows (that are in good condition,) field studies have found that they can help to reduce air movement into and out of existing windows, and thus reduce heating and cooling energy bills.

Types of Storm Windows

Storm windows are available for most types of windows. They are made for installation on the interior or exterior of the primary window. They range from the inexpensive plastic sheets or films designed for one heating season, to triple-track glass units with low-e coatings that offer many years of use. Mid-priced storm windows may use glass, plastic panels, or special plastic sheets that have specific optical qualities. Those made of polycarbonate plastic or laminated glass also offer a high degree of "breaking resistance" to storms and intruders too. No matter what type you choose, the storm window frame must be hung square with the primary window and sealed to the opening. Exterior-mounted storm windows must have "weep holes" at the bottom of the frame to allow any moisture that collects between the primary window and the storm window to drain out. Even though these drainage holes subtract from energy savings, not having them will eventually cause the primary window frame to rot, and possibly make them impossible to operate. Glass pane types offer better visibility and longer life than plastic pane types, but glass is heavy and fragile. Plastic panels, such as Plexiglas and acrylics are tougher and lighter than glass, but may scratch easily, and some materials may turn yellow over time. A low "tech" and inexpensive alternative is to install polyethelene plastic sheets or films on the room side of the window. You can find "do-it-yourself" kits in hardware and home improvement stores, which are plastic films that you tape over the window. Using a hair dryer to shrink-wrap the film around the window helps to tighten the film and improve its transparency. Such kits are used once and then removed at the end of the season.



In general, plastics are most economical for people with small budgets or who live in apartments. The primary advantage is to reduce air leakage into and out of the window. While inexpensive and relatively easy to install, they are easy to damage. Also, some plastic films may significantly reduce visibility and degrade over time when exposed to sunlight.

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Storm Windows

Frames

The material that the frame of a storm window is made of contributes to how well it insulates and how easy it is to maintain. Wood, aluminum, and vinyl are the most common storm window frame materials. There are advantages and disadvantages to all types of frame materials. Although very strong, light and almost maintenance free, aluminum frames conduct heat very rapidly. Because of this, aluminum makes a very poor insulating material. Wood frames insulate well, but weather with age and expand and contract according to weather conditions. Wood-frame storm windows installed during the winter may not close easily during the summer, and those installed during the summer may fit loosely in the winter. They can also be quite heavy and thicker than metal frames. This can make storage difficult, reduce the view out the window, and reduce the amount of natural light in the room. Out of most of the choices in storm window frames, wood frames also require the most maintenance. There are, however, aluminum or vinyl clad wood frames that reduce maintenance requirements. Vinyl frames are usually made of polyvinyl chloride (PVC) with ultraviolet light (UV) stabilizers to keep sunlight from breaking down the material. However, vinyl frames are relatively weak and may expand and warp at high temperatures and crack in extremely low temperatures. Also, if sunlight hits the material for many hours a day, colors other than white will tend to fade over time.

Exterior and Interior Storm Windows

For the most part, interior storm windows offer greater convenience than exterior storm windows. They are easier to install and remove and often need less maintenance because they are not exposed to extreme weathering. Interior storm window designs may also complement interior decor. Since they reduce air infiltration better, they also reduce energy loss more than exterior types.

Interior types inhibit air infiltration the most because they seal airtight to the primary window. This creates a superior dead-air space relative to exterior storm windows, which require weep holes. As mentioned above, exterior storm windows require weep holes to allow any rain that may be driven behind them or water vapor from inside the house that condenses in the space between the primary window and the storm window to run out of the window. If an interior storm window is sealed tightly to the primary window, the insulation value of the window increases by about R-1 for ordinary glass or plastic. If the glazing has low-e properties then the R-value increase could be as much as 2.

Cost and Payback

The payback period (the time it takes for the money from energy savings to pay for the purchase and installation of storm windows) depends on the initial cost of the windows, the climate, and the cost of fuel. Payback for storm windows in most climates can take decades. This may be offset by the increase in room comfort (fewer drafts) and perhaps an increase in house value (most homebuyers will probably prefer modern energy-efficient replacement windows.) If you can afford to install exterior storm windows, you can probably afford modern, energy-efficient replacement windows. Replacement windows that have low-e coatings and other energy saving features give a much better payback than storm windows alone. They also add much more to the value of, and comfort in, the house. In any case, when making a decision on what type of storm window to buy, in addition to the price, you should consider the following factors:

Convenience: Since storm windows must be periodically cleaned or opened for ventilation, they should be easy to move. Interior storm windows are often the best choice for apartments and houses with more than one floor.

Appearance: Consider how it will effect the overall look of your dwelling.

Maintenance: Remember that some types of storm windows require more maintenance than other types.

If you would like additional energy savings tips, please see our energy efficiency section at www.vectren.com or contact us by e-mail at marketinginfo@vectren.com.