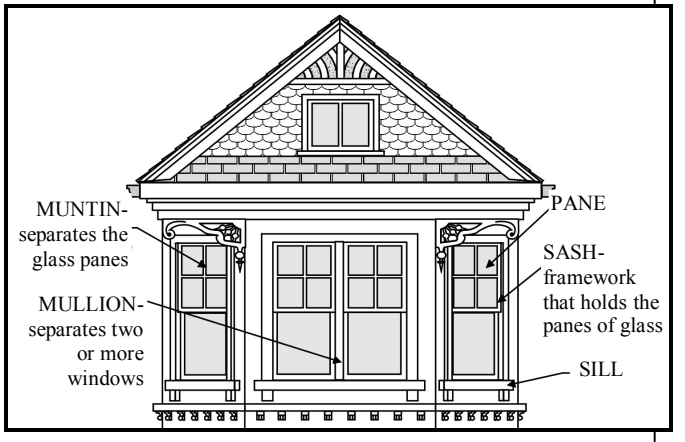


Q & A

How To Make Windows More Energy Efficient?

Our windows leak cold air in the winter months. Is there any way to make them more energy efficient?

Windows bring light, warmth, and beauty into homes and give a feeling of openness and space to living areas. They can also be major sources of heat loss in the winter and heat gain in the summer.



CONTROLLING AIR LEAKS

When air leaks around windows, energy is wasted. Several options are available to reduce the air leaks. The least expensive option is caulking and weather stripping. Next would be installing storm windows. Finally the most expensive is replacing the windows with energy efficient insulated glass.

REPLACING WINDOWS

The type and quality of the windows usually affect a window's air infiltration and heat loss characteristics. Many window types are available--all with varying degrees of energy efficiency. Some of the more common window types are fixed-pane, casement, double-hung, single-hung, horizontal sliding, hopper, and awning.

REDUCING HEAT LOSS AND CONDENSATION

Manufacturers usually represent the energy efficiency of windows in terms of their u-values (conductance of heat) or their r-values (resistance to heat flow). If a window's r-value

is high, it will lose less heat than one with a lower r-value. Conversely, if a window's u-value is low, it will lose less heat than one with a higher u-value.

Usually, window r-values range from 0.9 to 3.0 (u-values range from 1.1 to 0.3), but some highly energy-efficient exceptions also exist. When comparing different windows, you should ensure that all u- or r-values listed by manufacturers:

1. Are based on current standards set by the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE).
2. Are calculated for the entire window, including the frame, and not just for the center of the glass.
3. Represent the same size and style of window.

TYPES OF GLAZING MATERIALS

Traditionally, clear glass has been the primary material available for window panes in homes. However, in recent years, the market for glazing--or cutting and fitting window panes into frames--has changed significantly.

Low emissivity (low-e) glass has a special surface coating to reduce heat transfer back through the window. These coatings reflect from 40% to 70% of the heat that is normally transmitted through clear glass, while allowing the full amount of light to pass through.

Heat-absorbing glass contains special tints that allow it to absorb as much as 45% of the incoming solar energy, reducing heat gain. Some of the absorbed heat, however, passes through the window by conduction and re-radiation.

Reflective glass has been coated with a reflective film and is useful in controlling solar heat gain during the summer. It also reduces the passage of light all year long, and, like heat-absorbing glass, it reduces solar transmittance.

FRAME AND SPACER MATERIALS

Window frames are available in a variety of materials including aluminum, wood, vinyl, and fiberglass.

Wood frames have higher r-values, are unaffected by temperature extremes, and are less prone to condensation, but they require considerable maintenance in the form of periodic painting.

Vinyl window frames, which are made primarily from polyvinyl chloride (PVC), offer many advantages. They are available in a wide range of styles and shapes, have moderate to high r-values, are easily customized, are competitively priced, require low maintenance, and mold easily into almost any shape. However, vinyl frames are not strong or rigid, which limits the weight of glass that can be used.

Fiberglass frames are relatively new and are not yet widely available. They have the highest r-values of all frames; thus, they are excellent for insulating and will not warp, shrink,

