by Virginia L. Kubler

Solar Control Window Films: A Big Energy Saver

Window films can be an attractive, practical alternative to expensive treated glass.

As Americans have increasingly sought natural illumination, expansive views and sunshine for their homes, windows have become larger and more numerous to the point that, today, they represent a very significant element in home energy bills. Coincidentally, glass treatments increasingly are looked to as a means of reducing home energy bills. A recent study by the Arizona Commerce Department shows that some 40 percent of a home's heat use is a result of its window space, and approximately half of a home's utility bill can be attributed to heat gain and loss through glass.

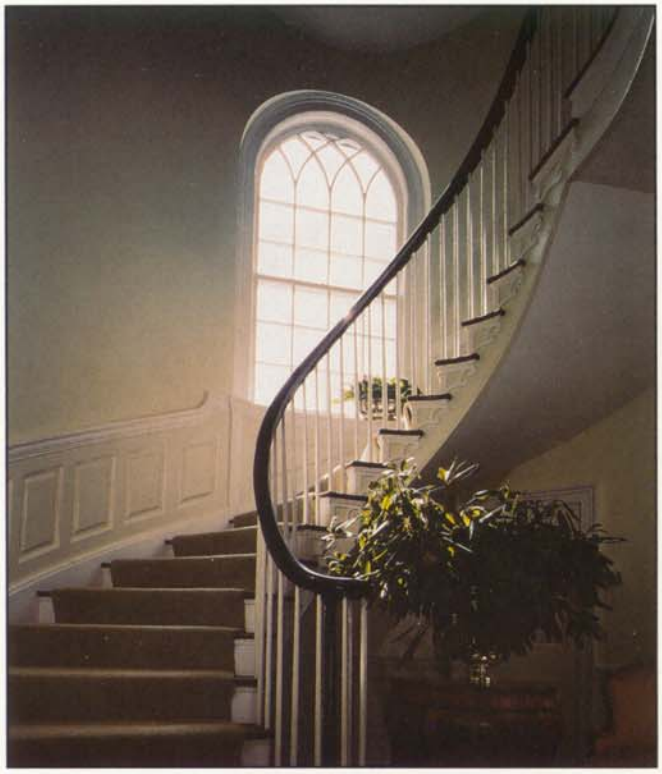
Cooling the home in summer with air conditioning to combat solar heat gain and heating in winter to reduce indoor heat loss are the primary energy uses for most homes. For ultimate protection and energy conservation, many consumers are turning to a combination of window film for energy savings and to reduce the fading effects of sunlight with draperies or blinds for privacy.

Solar Primer

Sunshine, or visible light, is only one part of solar energy, the other parts being harmful ultraviolet rays and infrared radiation, which is felt as heat. Infrared heat represents more than half of the sun's energy.

All solar energy must be either reflected, absorbed or transferred. Thus, the challenge for the window engineer is to achieve a desired energy balance for sunlit windows. Clear glass does not reflect much solar energy, while window film reflects both visible light and infrared heat. Clear glass transmits almost all solar energy. Window film transmits some visible light, but little else. Clear glass absorbs little solar energy. Window film rejects almost all ultraviolet light as well as some visible light and infrared radiation.

In short, for the best energy control (for other than visible light) a window film must be used. The energy savings provided by window film often are recognized by local utilities. In Florida,



Many window films are designed to meet solar heat problems. Vista Luminance by Courtaulds Performance Films, Inc. transmits 30 percent of visible light but rejects 65 percent of solar energy and 99 percent of harmful ultraviolet rays.

Window film is easily applied by professional installers who work with retailers on a sub-contractual basis. Vista Luminance creates a neutral interior appearance with low interior reflectance.

Orlando Utilities and Florida Power & Light offer significant rate rebates to encourage customers to install window film, as does Los Angeles Watt & Power in California.

Sophisticated Products

Each year, more sophisticated films come onto the market. Among these are films designed specifically to meet heat problems. A state-of-the-art window film is one that would transmit 30 percent of the visible light while rejecting 65 percent of the solar energy (a 10 percent improvement over most existing films with the same light transmission). In addition, a premier window film would have a shading coefficient of .40 (a 20 percent improvement over other films with the same light transmission) and reject 99 percent of the ultraviolet rays.

These properties usually result in a film that has very high interior reflectance, which means the film reverses at night—people outside can see in and the people inside see a reflection and cannot see out. A high quality window film would do the exact opposite, create a neutral interior appearance with low interior reflectance. Also, window films should have a durable scratch-resistant coating and carry a warranty.

Installation

Window film is installed as a retrofit item on the interiors of windows, often applied by professional installers who work with retailers on a sub-contractual basis. In many cases, installation can be done without interrupting the day-to-day activities of the home owner.

One of the most important considerations in selecting the best window film for a particular need is the shading coefficient, which is a measure of the efficiency of a window system's solar control capability. The shading coefficient is expressed as the ratio of the solar heat gained through any given window system to the solar heat gain that would occur under the same conditions if the window were made of clear, unshaded, double-strength window glass. The lower the shading coefficient, the greater the capacity of the window to control solar energy.

The primary specifications affecting heat loss are:

- U-Value—the amount of heat passing through one square foot of glass in one hour for every one degree Fahrenheit temperature difference. The lower the U-Value, the greater the heat loss reduction.
- R-Value—the resistance value expressed as a reciprocal of the U-Value.
- Emissivity—the ability of a surface to absorb heat and to reflect it. The lower the emissivity, the less room heat is absorbed thus more heat is reflected back into the room.

Today, makers of solar control window films offer a wide range of energy-balanced films from which to choose. Films are offered with detailed engineering specifications to assist in determining the most suitable film, whether in a residential or commercial installation.

Virginia L. Kubler is the director of sales and marketing for Courtaulds Performance Films, Inc., Martinsville, VA, a leading manufacturer of both film components and coated and laminated films for solar insulation. The company offers a premier line of window films including its newest, Vista Luminance.

Reprinted with permission of

D&WC
The Magazine for the American Window Coverings Professional
Draperies & Window Coverings