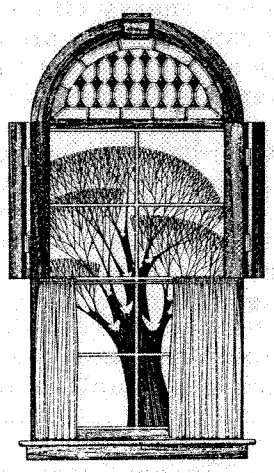
service in ACTION

Colorado State University Cooperative Extension

no. 9.512

Evaluating energy efficient window treatments/systems

Craig Birdsong and Donald J. Sherman[1]



Quick Facts

The number of window products advertised as "energy efficient" makes it difficult to know what products or treatments to choose.

To evaluate a treatment for energy efficiency make a judgement based on insulating materials, provisions for a tight seal, vapor barrier and other considerations.

At present there is no single, standardized test used by all manufacturers or laboratory testing centers to test energy efficiency of window treatments or systems.

Consider the existing window system and its effectiveness before adding additional treatments.

As consumers, our awareness of the potential heat loss through windows has increased. Now, we want to know how to make sound decisions about the variety of "energy efficient" window treatments available.

The number of products available is part of the problem in knowing what products or treatments to choose. Other problems often encountered include:

- a lack of responsiveness on the part of sellers to provide information supporting energy-saving claims;
- the information, when provided, often is highly technical, inaccurate or irrelevant to the consumer's situation; and
- it's difficult to learn through experience and then switch to a more effective product because the energy savings are not always measurable (even after purchase) and the purchases often are costly and infrequently made.

Evaluating a Treatment

To evaluate a treatment for energy efficiency make a judgement based on the energy efficiency of the basic parts of the treatment. An energy-efficient treatment will contain:

- *insulating materials* (must be capable of resisting air movement; the higher R-value the more resistant the material),
- *provisions for a tight seal* (around all four sides of the treatment, sealing the treatment to the window frame), and
- *a vapor barrier* (necessary to prevent condensation on the window and within the insulating materials).

In addition, the treatment needs to allow for an air space of ¾ inch to 1½ inches between the window glazing and the treatment. This air space serves as insulation.

---

[1]*Craig Birdsong, Colorado State University Cooperative Extension consumer specialist and associate professor; and Donald J. Sherman, professor; design, merchandising and consumer sciences (2/90)*

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Kenneth R. Bolen, director of Cooperative Extension, Colorado State University, Fort Collins, Colorado. Cooperative Extension programs are available to all without discrimination. To simplify technical terminology, trade names of products and equipment occasionally will be used. No endorsement of products named is intended nor is criticism implied of products not mentioned.

Other considerations to evaluate a treatment include whether the treatment is adaptable to the window, safe in terms of operation, difficult or impossible to operate in case of fire or other calamity, cost effective and how it compares with expected energy savings, easy to install, operate and maintain, and satisfactory with the appearance and compatibility (of style, materials, colors, textures) with other home furnishings.

Testing of Treatments

At present there is no single, standardized test used by all manufacturers or laboratory testing centers to test energy efficiency of window treatments or systems. Many products are advertised as energy efficient based on "test" results. Testing for energy efficiency is important; however, it is equally important to use such results only to indicate a relative or approximate ability of the treatment to restrict air flow. Inaccuracies and misrepresentation occur when different treatments are compared, unless they have been rated using the identical test and under identical test conditions. Often this is not the case.

Testing conditions are not standardized. The size of the sample tested, the type of primary window over which the sample is tested, the wind speed and direction, and the number of glazings are all important factors that affect test results.

In 1984, the Window Energy Systems (WES) Standards Committee approved a uniform testing procedure to standardize thermal transmittancy claims of window treatments and moveable insulation. However, this procedure was never operationalized, and eventually WES disbanned.[3] The Technical Committee of the American Window Coverings Association is developing a set of standards for similar purposes. It is unknown when common testing methods and reporting will be available to consumers.

Evaluating an Energy Efficient Window System

Though treatments are important, their importance is actually in terms of their contribution to the *total window system*. While some people use the terms synonymously, window "treatment" and window "system" are not the same. A window "treatment" refers to a method or technique to control specific functions of a window. Draperies, storm windows and most moveable insulation are examples of window treatments. Their functions may be to reduce heat loss, provide light control or create privacy. A window "system" refers to a total unit concept, in which all parts of the system are considered for their significance to reduce heat gain/loss through the window. A window system might be a set of draperies that cover moveable insulation over a single-glazed window where a storm window has been added.

The effectiveness in reducing heat gain/loss through the window will come with the combined effectiveness of all parts of the window system. Window systems are evaluated in much the same way as treatments: an accumulation of insulating materials (high R-values) that includes air spaces, tight seals and vapor barrier. However, to evaluate the system it becomes even more important to remember that while R-values of materials are cumulative, the effectiveness of the other parts to reduce heat gain/loss increases at a decreasing rate. For example, if the R-value of an existing window system is doubled (say from R-2 to R-4), the resulting effectiveness will not be twice as great; it will be 50 percent greater. If that system is doubled (from R-4 to R-8), the effectiveness of the total treatment will increase by 25 percent. Therefore, it's important to consider the existing system and its effectiveness before adding additional treatments.

Five major considerations include:[5]

1. *Performance.* Are the windows you plan to cover already weathertight? How much insulation is needed? Which windows lose the most heat?
2. *Location.* Which windows are needed most in the daytime for heat, light and view? Which windows are needed for emergency exits? Which windows are near sources of heat or moisture?
3. *Assembly.* How much time, effort and dollars can you spend? Do you have the skills, tools and patience?
4. *Operation.* How much time and effort is spent to open and close the various parts of the system? Which rooms are used the least? Can one easily reach the operating parts of the system (including children and elderly)? Will furniture arrangement be affected by the operation? Will window hardware, sill, frame, storm windows, etc., impede the operation of proper insulation?
5. *Appearance.* In addition to the appearance of the interior treatment, is the total appearance of the system pleasing? Do existing windows have a special character that should be preserved?

Testing of Systems

At present, window systems are not tested as such. Usually a test is conducted on a treatment over some form of glazing—it may be single or double—though often this is not consistently noted in advertising claims. The intent to standardize testing and reporting indicated above under "Testing of Treatments" will not accomplish this. Therefore, consumers need to exercise judgement when increasing the effectiveness of a particular window system based on the relative heat gain/-loss potential.

References

[2]U.S. General Accounting Office, *Consumer Products Advertised to Save Energy—Let the Buyer Beware.* July 24, 1982.

[3]*Window Energy Systems,* May 1984, p. 8.

[4]Personal communication with the office of Peter Rusch, American Window Coverings Association Technical Committee, January 16, 1990.

[5]Warme, Lois. Material presented in "Workroom Installation Techniques" seminar and published in *Window Energy Systems,* May 1983, pp. 44-45.