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# Evaluating energy efficient window treatments/systems

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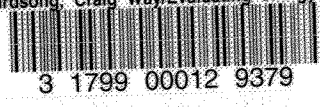
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purchases often are costly and infrequently made.

## Quick Facts

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

When evaluating a treatment for its potential energy efficiency, it's important to remember to make the judgement based on its insulating materials, its provisions for a tight seal, its vapor barrier, as well as a number of 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.

It is important to consider the existing window system and its effectiveness before adding additional treatments.

## Evaluating a Treatment

When evaluating a treatment for its potential energy efficiency, it's important to remember to make your judgement based on the energy efficiency of the basic parts of the treatment. An energy efficient treatment will contain:

- *Insulating materials* (these 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),
- *A vapor barrier* (necessary to prevent moisture from condensing on the window, within the insulating materials).

In addition, the treatment needs to allow for an air space of about 3/4" to 1 1/2" (1.9 to 3.8 centimeters) between the window glazing and the treatment itself. This air space serves as insulation.

*Other considerations in evaluating a treatment include* whether the treatment is adaptable to your particular windows, its safety in terms of actual operation and whether it may be difficult or impossible to operate in case of fire or other calamity, the initial cost and how that compares with the energy savings you can expect, the ease of installation, operation and maintenance of the treatment, and your satisfaction with the appearance of the treatment including its compatibility (of style, materials, colors, textures) with your home's furnishings.

## Testing of Treatments

More and more, many products are advertised as energy efficient based on "test" results. Testing for energy efficiency is important; however, at present, 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 differing treatments are compared, unless they have been rated using the identical

<sup>1/</sup>Craig Birdsong, CSU assistant professor; family housing (9/1/83)

As consumers, our awareness of the potential heat loss through windows is increasing. And, we want to know how to make sound decisions about the variety of "energy efficient" window treatments available. A recent magazine devoted to window systems featured over 24 pages introducing almost 100 new products onto the market—most of which are advertised as "energy efficient."

The sheer number of products available is part of the problem in knowing which products or treatments to choose. Other problems often encountered include:<sup>1</sup>

- 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 not relevant 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

test and under identical test conditions—often this is not the case.

At present, there is no single, standardized test used by all manufacturers or laboratory testing centers. Nor are the testing conditions 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 affecting test results.<sup>2</sup>

However, efforts are under way to standardize testing methods and thus allow consumers a legitimate means of comparing window products/treatments. A specification committee has been formed by the Industrial Fabrics Association International to accomplish this; when such common testing methods and reporting will be available for consumer use is yet unknown.<sup>3</sup>

### 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. "Treatment" refers to a method or technique of controlling 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 in reducing heat gain/loss through the window. A window system might be made up of a set of draperies covering moveable insulation over a single glazed window to which a storm window has been added.

The true effectiveness in reducing heat gain/loss through the window will come with the combined effectiveness of all of the parts of the window system. Window systems are evaluated in much the same way as treatments: an accumulation of insulating materials (high R-values) including air spaces, tight seals and vapor barrier. However, in evaluating the system it becomes even more important to remember that while R-values of materials are cumulative, the effectiveness of the various parts in reducing 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 again (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:<sup>4</sup>

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, 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 required.
4. *Operation*. How much time and effort can be spent opening and closing 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 the proper insulation?
5. *Appearance*. In addition to the appearance of the interior treatment, is the total appearance of the system pleasing? Do the existing windows have a special character that should be preserved?

### Testing of Systems

At the present time, window systems are not tested as such. Usually, the testing 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 will need to exercise judgement in increasing the effectiveness of a particular window system based on the relative heat gain/loss potential.

### Tax Credits for Treatments/Systems

Many window treatments and/or systems are advertised as qualifying for state and/or federal tax credits. If you are unaware of the eligibility criteria and how it relates to your potential purchase, be sure to check with your local Internal Revenue Service and state energy office; some advertisements are inaccurate and/or misleading in their applicability to you and your home.

### References

- <sup>1</sup>U.S. General Accounting Office. *Consumer Products Advertised to Save Energy—Let the Buyer Beware*. July 24, 1982.
- <sup>2</sup>*Energy Savings Device Newsletter*. Metropolitan Denver District Attorney's Office of Consumer Fraud and Economic Crime, Denver, Colorado. 6 (July 1981).
- <sup>3</sup>*Window Energy Systems*, August 1982.
- <sup>4</sup>Warme, Lois. Material presented in "Workroom Installation Techniques" seminar and published in *Window Energy Systems*, May 1983, pp. 44-45.