



SOLAR COMFORT WINDOW COVERING PRODUCTS PRESENTS

SEVEN AREAS OF PERFORMANCE

When evaluating a window-covering product that is designed to control the movement of radiant energy, there are seven significant areas of **Product Performance** that should be considered collectively, in selecting the product that will provide the highest level of total performance, protection and greatest personal comfort.

These areas of product performance include:

1. Reflectivity
2. Surface Heat Retention
3. Visibility
4. Directional Heat Control
5. UV protection
6. Healthful Sun Light
7. Potential Energy Savings

Where to start ?

- In the evaluation of products that protect you from the radiant heat of the sun, it is important to understand the nature of what happens as the rays of the sun pass through windows and comes in contact with any surface inside the home or office. The sun's rays are cold electromagnetic waves as they travel through space. It is not until they come into contact with something that they are converted into heat energy. For example; when the sun's rays hit your face, you feel the heat on your skin. When the sun's rays contact a window, only a small portion of energy is converted to heat at the window, with the balance of the sun's rays continuing on into the room. As the sun's rays hit the floor and the furniture in the room the radiant energy is converted into heat.
- There are two physical laws of heat energy that are essential to understand in this evaluation.
 1. The movement of heat is always from high pressure to low pressure, or from hot to cold.
 2. For every unit of heat energy that passes through a window, an equal amount of cold energy must be exchanged through the glass in the opposite direction.Glass is the greatest source of heat gain or loss in buildings. Radiant energy accounts for 80% of all heat movement. The two other factors in heat movement are convection and conduction. Together they account for the other 20% of heat movement. (See chart below)
- Companies manufacturing window covering products will advertise the features of their products where they believe they excel, leaving the customer to assume that these are the only areas of product performance that need consideration. **Solar Comfort** is the only window-covering manufacturer whose products excel in all seven areas of product performance.

Reflectivity

- The manufactures of window covering products design their products to block the sun's rays from entering the home or office. The measure of effectiveness is reported as a percentage of reflectivity. Simply stated, if the rays of the sun are reflected out of the room; they do not have the opportunity to turn into radiant heat energy inside of the room.
- **Solar Comfort** products are manufactured using products developed by NASA for the construction of their space suits and for other applications in the space program. Having utilized this space technology, the **Solar Comfort** products have a very high degree of reflectivity.

Surface Heat Retention

- Most window coverings are not designed with a high degree of reflectivity, but are designed with the idea of creating shade. Unfortunately, as the radiant energy strikes the surface of the shading material, it creates a heat zone on the front and backside of the window covering. The heat created on the surface of the window covering will continue to radiate into the room increasing the room temperature.
- **Solar Comfort** products are designed to reflect radiant energy away from the surface of our window covering products. Because of the high degree of reflectivity of **Solar Comfort** products, the surface of the window coverings remain cool thus eliminating surface heat as a contributor to the temperature of the room.

Visibility

- There is a critical balance between the shading properties of a product, and the degree of visibility allowed through the product. This property is expressed within the industry as the "openness factor". With most window covering products, the lower the openness of the weave, the greater the degree of shading the product will provide. As you increase the shading factor you greatly reduce the ability to see through the product. Since the window covering products of most companies are not efficient in reflecting heat energy, they elect to increase the shading value of their products and in the process significantly lower the visibility or openness of their products. Most shading materials start with an openness of 3 -5% in order to provide high levels of shading.
- **Solar Comfort** products have a very high degree of reflectivity. Because of this factor we are able to perforate our window covering material with an openness of 38.6%. This provides the highest degree of visibility of any product on the market. With less than a 10% reduction in perceived visibility, the material seems to disappear from view as it reduces the glare of the sun. You will need to see it in action to believe it.

Directional Heat Control

- Radiant heat doesn't just come from the sun. There is an enormous amount of radiant heat created within the home or office. The same principle of radiant heat movement through a window applies in the wintertime. For every unit of heat energy that moves through a window, an equal unit of cold energy is exchanged. Unfortunately, nearly all window-covering products are uni-directional. This means they are designed to shade the home or office from the heat of summer. They are not designed to address of the problem of heat loss in the winter. For example: one window-covering product advertises a reflectivity rate of 70%. The rate at which this particular product reflects radiant heat back into the room is only 6%.

- **Solar Comfort** products are bi-directional. The highly reflective performance of the product works in both directions. When radiant heat energy is blocked from going out through a window in the wintertime, the cold energy on the outside is effectively blocked from transferring through the window. The cold drafts in a home or office are caused by an unrestricted flow of hot and cold energy transfer through the windows. With **Solar Comfort** products, what have been the least comfortable rooms can now be the most comfortable rooms in the home or office.

UV Protection

- The Ultra-Violet rays of the sun can be very destructive to most any surface. If a window-covering product is effective in preventing radiant energy from entering the home or office, it will also be effective in eliminating the harmful UV rays. It will also reduce the production of off gases in your homes and offices.
- **Solar Comfort** products have a very high degree of reflectivity and shading co-efficiency, thus, providing an appropriate level of protection without blocking all of the UV-A which we need.

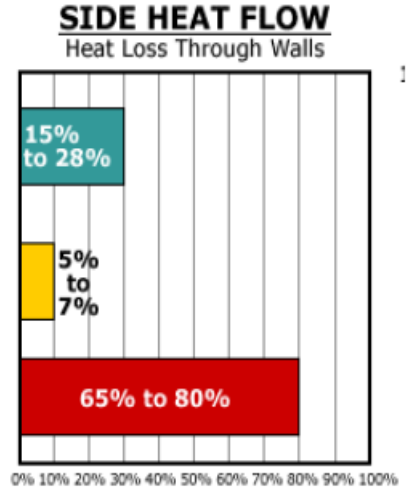
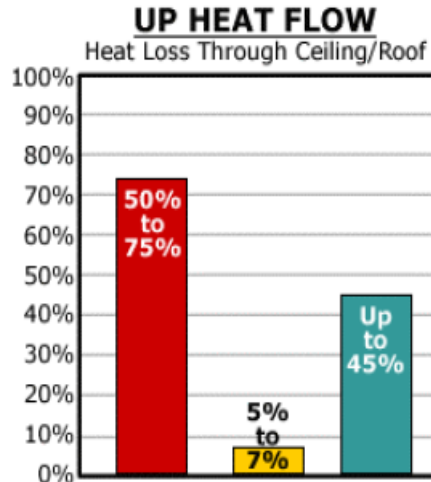
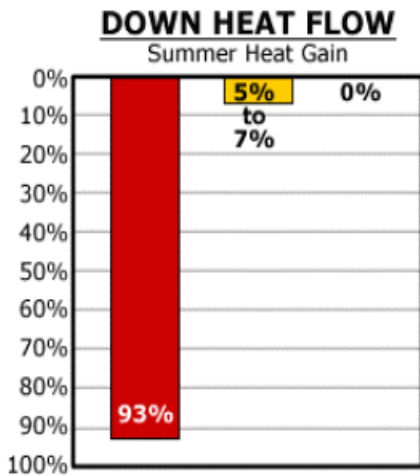
Healthful Sun Light

- Studies have shown that we are healthier and happier if we live and work in a sun lit environment. Most window-covering products have very little openness because of the requirement to provide a higher level of shading. When the openness is restricted, the amount of healthful light entering the room is also restricted.
- **Solar Comfort** products have a very high degree of reflectivity, which allows a higher degree of openness or visibility. With this openness also comes a greater volume of “healthy and happy light” that is allowed to enter the home or office. **Solar Comfort** products provide a much better environment for work and study.

Potential Energy Savings

- The induction of radiant heat energy through a window can pose an enormous energy problem in a home or office. During the summer or winter, temperatures in a building can vary as much as 12 to 15 F degrees throughout the day or even from one room to another. Large HVAC systems are installed to handle the huge variations in temperature demands. The purchase price and operating costs of these systems can be significant.
- The physical laws of heat energy transfer will always apply. For every unit of heat passing through a window, an equal unit of cold must move in the other direction. The result is HVAC systems that are working overtime to generate hot or cold air that is going right out the window.
- **Solar Comfort** products greatly reduce the exchange of heat and cold in both summer and winter. Many **Solar Comfort** customers have reported being able to turn down, or turn off, their HVAC systems at times of the year where they had not been able to so before. Some customers have reported room temperature reductions of up to 20 degrees F after the installation of Solar Comfort Products during the summer months.
- The extent of energy savings realized with **Solar Comfort** products will depend on: 1) the number, size and exposure of the windows, 2) the size and location of the rooms, 3) the age and efficiency of the HVAC unit, and 4) the cost of energy. Our experience shows that when **Solar Comfort** products are used throughout the home or office, energy savings between 30 to 40% of the annual energy costs can be achieved.

DIRECTIONAL HEAT FLOW CHARTS



AVERAGED

7% **Conductive:** Direct contact. If you touch a pot on the stove, this is conductive heat transfer.

15% **Convective:** Steam, moisture. If you put your hand above a boiling pot, you will feel heat in the form of steam. This is convective heat transfer.

80% **Radiant:** Electromagnetic. Step outside on a sunny day and feel the sun's rays on your face. You are feeling radiant heat transfer. All objects above absolute zero (-459.7 degrees F.) emit infrared rays in a straight line in all directions.

CLARITY OF VISION

The view through vertical blinds in an office. The Before blinds are typical PVC verticals and the After are made from Solar Comfort "standard shear" material.

BEFORE



AFTER

