



WINDOW FILM: THE FIRST-STEP ENERGY CONSERVATION MEASURE

According to the Center for Climate and Energy Solutions (C2ES), "Space heating, cooling, and ventilation account for the largest amount of end-use energy consumption in both commercial and residential buildings. In the commercial sector they are responsible for 34 percent of energy used on site and 31 percent of primary energy use." (C2ES, Building Envelope; Quick Facts; April 2011; <http://www.pewclimate.org/technology/factsheet/BuildingEnvelope>.) C2ES sites residential and commercial buildings accounting for approximately 39 percent of U.S. energy consumption and 38 percent of U.S. carbon dioxide emissions.

A major component of any building envelope is its fenestration including windows, doors, skylights and curtain walls. A 10 to 40 percent reduction in lighting and HVAC costs can be achieved by improving the energy efficiency of fenestration of commercial buildings. According to the U.S. Department of Energy/Energy Efficiency and Renewable Energy, windows account for 10 to 25% of heating bills and they are the greatest source of heat loss and gain in any building. Minimizing this heat loss in colder months and heat gain in warmer months is crucial to reducing the amount of energy required to heat and cool a building. A quality window film retrofit is recognized as a cost effective solution for improving any building envelope's energy efficiency.

Window film manufacturers are now able to certify their products' energy performance ratings according to the National Fenestration Rating Council (NFRC) certification process. The NFRC provides an independent, third-party verification of window film performance. Its rating system allows consumers to compare window film products and to verify their energy performance. An NFRC label provides units of measure that are valuable when applying for LEED credits, including:

- Solar Heat Gain Coefficient (SGHC) - a measure (between 0.0 and 1.0) of how well a product blocks heat from the sun. The lower the SGHC, the better a product is at blocking heat gain.
- Visible Transmittance (VT) - a measure (between 0.0 and 1.0) of how much light comes through a particular window film product. The higher the VT, the higher the potential or daylighting.

For architects, engineers and building owners looking to achieve LEED certification, many window films meet LEED Energy and Atmosphere Prerequisites and qualify for LEED

credits. Qualifying categories for credits include "Indoor Environmental Quality", "Daylight and Views" and "Optimize Energy Performance" among others.

Insulating, Low-E window films have been specifically designed to conserve energy. Featuring "Wavelength-Selective" metals which block more of the solar spectrum than conventional metals, some window films can reduce air conditioning costs by blocking up to 73 percent of the sun's heat. They can also reduce heat loss by up to 30 percent. Utilizing a metal coating, their construction enables interior room heat to be reflected back into the room. Personal comfort is improved and reduction in drafts and fluctuations in temperature can generate considerable savings on fuel expense.

If a building already has Low-E windows installed, window film can enhance their performance. A Low-E window can block up to 90 percent of UV radiation. The same window with an appropriate window film installed will block more than 99 percent of the UV radiation that contributes to heat loss and gain. Also, Low-E windows do not ordinarily reduce glare since most have a visible light transmission greater than 70 percent. There are window films on the market that can reduce glare by up to 80 percent.

In addition, window films will improve the safety of Low-E windows that do not typically protect against flying glass unless they are tempered. If safety is a priority, there are specific window films manufactured for maximum impact mitigation. Designed to hold shattered windowpanes together in the event of blasts, high-impact blows or violent weather, safety films significantly enhance security and reduce the risk of injury from flying glass shards.

The energy efficiency and safety of a building envelope has rapidly become a priority for architects, engineers and building owners. A quality window film, professionally installed, affords little disruption to business continuity and will pay for itself in short order with dollars saved in utility expense. For large-scale projects, an authorized window film dealer will be able to assist with appropriate film selection for a specific application as well as with documentation of return-on-investment projections. It makes good sense to prioritize your energy conservation measures with a "first-step" installation of cost effective insulating window film.

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