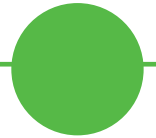
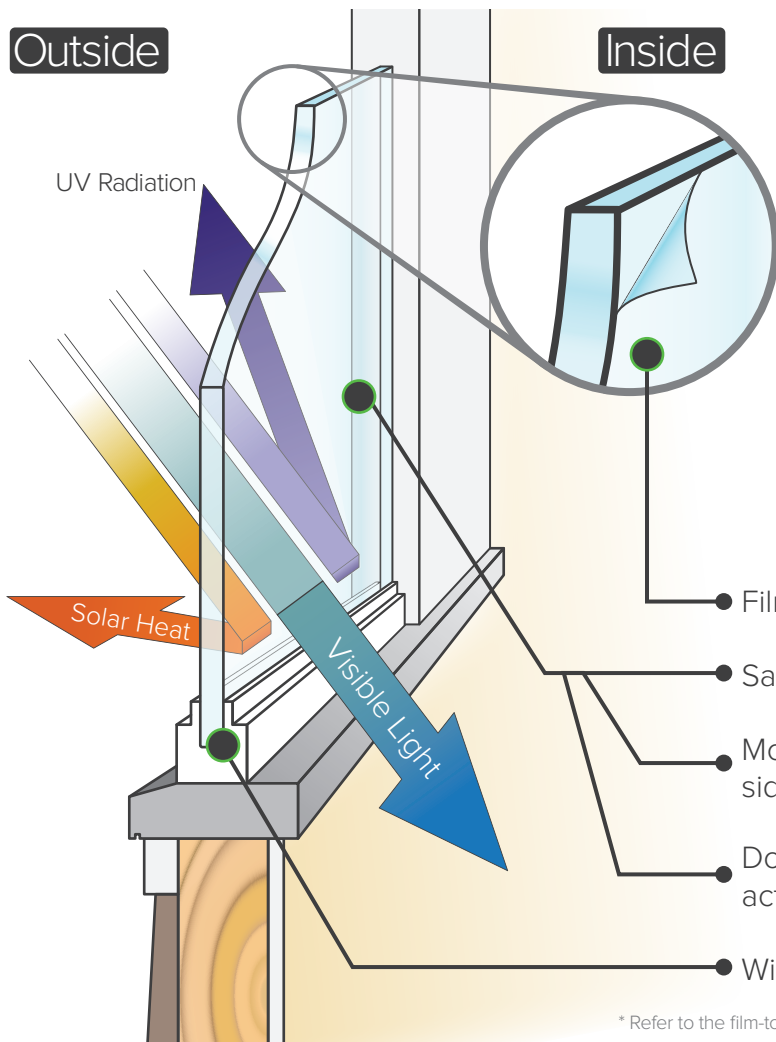


# WINDOW FILM IN COMMERCIAL BUILDINGS



One of the largest sources of heat that a heating and cooling system has to work to remove during warmer months is solar heat gain transmitted through windows. This can be reduced by installing window film to your existing windows, making your building more energy efficient while increasing occupancy comfort. Window films also protect occupants by blocking 99% of ultraviolet rays and reduce fading of furniture and flooring materials.



**U-factor** measures the rate of heat transfer and tells you how well the window insulates. U-factors generally range from 0.25 to 1.25 and are measured in Btu/h. ft<sup>2</sup> °F. The lower the U-factor, the better the window insulates.

**Solar Heat Gain Coefficient (SHGC)** is the fraction of incidental solar radiation admitted through a window, both directly transmitted and absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower the SHGC of a window, the less solar heat it transmits.

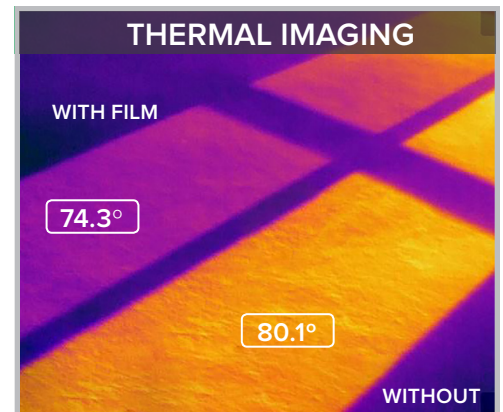
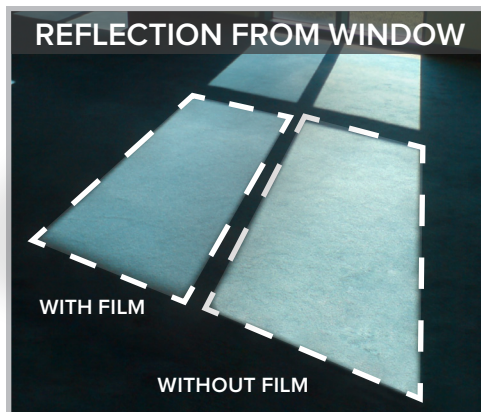
- Films come in various SHGCs and U-factors
- Safe to install on most insulated glass and double panes\*
- Most commonly installed on the interior side of the window
- Do not always darken the view outside, they can actually improve visibility by reducing glare
- Will not damage seals on most window assemblies\*

\* Refer to the film-to-glass recommendation table provided by your window film manufacturer or contractor.

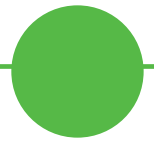
## How window film works:

Typical window films are between 0.001" – 0.004" thick and are made with different adhesives that can be applied to single or double glazed windows. The photos to the right show the improvements window films can make to reduce solar heat gain, increase comfort and reduce glare.

Photos courtesy of the International Window Film Association



# SUCCESS WITH WINDOW FILM



Some Dominion customers have reduced operating costs in their non-residential buildings by installing window film. Below is a sample of these buildings with real savings data.

| Annual Energy Cost Savings in % | Annual Energy Bill before Window Film | Window Film Invoice | Payback Period | NPV 15yr/5% Discount Rate |
|---------------------------------|---------------------------------------|---------------------|----------------|---------------------------|
| 0.86%                           | \$307,189                             | \$2,222             | 0.8 years      | \$25,284.09               |
| 0.88%                           | \$52,926                              | \$2,500             | 5.3 years      | \$2,132.56                |
| 1.79%                           | \$14,158                              | \$1,457             | 5.7 years      | \$1,057.25                |
| 1.94%                           | \$393,630                             | \$7,485             | 1.0 years      | \$68,041.63               |
| 27.16%                          | \$2,496                               | \$2,965             | 4.4 years      | \$3,746.28                |

It is important to consider different attributes of your building before installing window film. Certain characteristics such as building orientation, overhangs above windows, and the glazing to exterior wall ratio may show that you only need window film in certain areas to significantly increase performance and comfort. Below is a segment from an energy model that shows two identical east facing hotels with window film installed. The only difference is that one hotel has overhangs above the windows while the other does not.



A coastal hotel example with 50% clear glass exterior glazing. Window film with an SGGC of 0.28 and a winter U-factor of 0.6.

## HOTELS WITH AN OVERHANG

Energy Savings per year = 52,101 kWh / \$3,746  
 Demand Savings per year = \$2,146  
 Simple Payback = 8.3 years

## HOTELS WITHOUT AN OVERHANG

Energy Savings per year = 125,762 kWh / \$8,957  
 Demand Savings per year = \$2,685  
 Simple Payback = 4.2 years



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