

### SerraGlaze® Daylight Redirecting Film

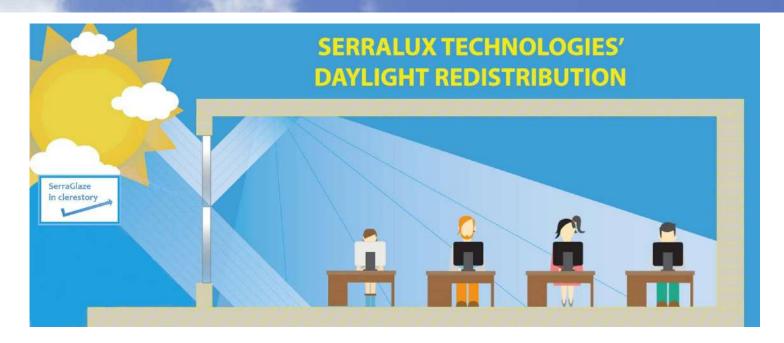


# Harnessing the Power of Daylight

Daylighting saves energy, increases building value, and enables people to perform better. SerraGlaze Daylight Redirecting Film harvests daylight by redirecting sunlight deeper in the room Buildings with adequate beneficial daylight have been shown to enhance People, Planet & Freth.

> Lower energy costs Reduce absenteeism Increase building value Improve visual comfort Speed patient recovery time Improve student performance Increase employee productivity





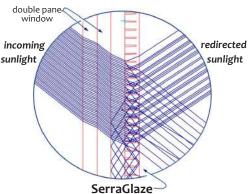
## Take Advantage of Abundant and Free Daylight

SerraGlaze® Daylight Redirecting Film is designed to bring the power of daylight inside to improve our homes, schools, and work spaces with nature's gift of natural illumination. Studies show that adequate amounts of beneficial daylight is ideal for the health and well-being of occupants. Daylight is healthy, abundant, and free!

- Deeper beneficial daylight for health, well-being, and performance of occupants
- Payback on all economic benefits of less than 1 year
- Estimated energy payback of 2 to 6 years
- Energy savings up to 2.5 kWh/ft2 of affected floor area
- Preserves the window view while being economically compelling

### Daylighting with a View

SerraGlaze® Daylight Redirecting Film is a **see-through**, single film applied to the interior surface of new or existing windows. This thin film contains micro-structured "louvers" that help convert harsh glare into beneficial daylight by redirecting the incoming sunlight upwards. The ceiling becomes a light fixture which spreads diffuse natural illumination to the desktops and throughout the space.



applied to interior of the window utilizing Total Internal Reflection ("TIR") Note: Fresnel Reflection turned off

# How SerraGlaze Works



SerraGlaze Daylight Redirecting Film is installed in the upper portion of the window.



Glare is redirected towards the ceiling which then converts it into beneficial daylight, illuminating the space below.



SerraGlaze is a thin film containing microstructured "louvers" which redirect most of the sun & skylight upward.

# **Enhance Daylighting and Exhilarate Spirits**

On average we spend 90% of our time inside, so it is important that the design of indoor environment enable sufficient beneficial daylight to promote optimum health and well-being. SerraGlaze® Daylight Redirecting Film introduces more daylight while maintaining the view; both are essential for occupant well-being and comfort.



#### Before SerraGlaze

Direct sunlight can create harsh glare and visual discomfort. Without glare managed, shades are drawn and the benefits of natural lighting negated.



#### After SerraGlaze

Sunlight is redirected to the ceiling which spreads light more evenly, reducing glare and harsh shadows. Making it easier to see objects, and colors appear more vibrant.



#### Daylighting with Views

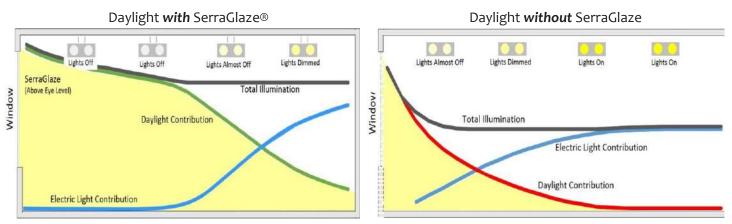
With see-thru SerraGlaze on the upper window\*, one still feels connected with views to the outside world. Great for visual comfort and sense of well-being.



## Daylighting with Blinds

With blinds closed to block glare entering the lower window\*, daylighting continues to penetrate and illuminate the room from above. \* SerraGlaze on Upper Left Pane only

#### SerraGlaze Performance



interaction between natural light and electric light at various distances from window

### Study the Model

#### Location

• Los Gatos, California

#### Comparison

- SerraGlaze Daylight Redirecting Film
- Plain Glass

#### Results

• Most evident is that throughout the day a higher, more evenly distributed and comfortable level of beneficial natural illumination exists in the SerraGlaze space.



Scaled model shows SerraGlaze Daylight Redirecting film hung above 7' in the left side space. Only Plain Glass in the right side space.

To mimic real life, "blinds" are hung below eye level.

This photo is representative of the illumination differences throughout the day. Light through SerraGlaze is redirected towards the ceiling and deep into the space then diffused downward throughout the room. On the Plain Glass side, the sunlight simply goes directly downward onto the desk nearby as high level glare-there is minimal diffusion throughout the rest of the room. (Compare the diffused natural daylight on the ceiling, walls, carpet and desktops).

Modeling was done on a sunny, spring day (Feb 21, 2014, 12:00 noon)

#### SerraGlaze® DRF options

Many factors affect daylighting performance, such as building design, weather, location, and orientation. SerraGlaze Select-50/60/70 and SerraGlazeDiffuse-4 offer important new *Daylight, Glare* and *View* control features designed to tune to the needs of the space.





To see a time-lapse of SerraGlaze at work visit: www.SerraLuxInc.com

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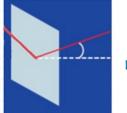


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Many factors affect daylighting performance, such as building design, weather, location, and orientation. SerraGlaze has expanded to a family of Daylight Redirecting Film products with important new *Daylight*, *Glare* and *View* control features designed to attenuate the daylight and reduce glare.





redirecting light upward



SerraGlaze Select



SerraGlaze D-4



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#### SerraGlaze Daylight Redirecting Films

SerraGlaze Daylight Redirecting Films harvest daylight by redirecting sunlight towards the ceiling and deeper into the space. The ceiling becomes a natural light fixture illuminating the room with more desirable diffuse daylight. Along with reducing the need and costs of electric lighting, improved daylighting is known to increase occupants' overall comfort, health and well-being.

#### SerraGlaze Select 50/60/70

SerraGlaze Select comes with a series of frit coatings enabling the selection of film most suitable in achieving recommended light levels for the space. The frit attenuates the amount of the natural light entering the windows, further reduces glare, and provides a visually crisp appearance to the outdoors.

Windows oriented towards the equator (South in the Northern hemisphere, North in the Southern hemisphere) typically need modest attenuation before redirecting sunlight to the ceiling, whereas East and West facing windows--in the direction of the rising and setting sun-may need to block more of the light to avoid the glare of a low sun. Ask your window film professional for the best selection to suit your needs.

#### SerraGlaze D 2/4/6/8

SerraGlaze-D (Diffuse) is designed for applications where minimizing glare is essential while attaining beneficial daylighting deep into the space. Generally, SerraGlaze-D is applied to windows that are designed for admission of sunlight but where views are not important or privacy is desired.

Currently, SerraGlaze-D is available in D-4, having a diffusion angle of ±4 degrees for a total diffusion of 8 degrees. The SerraGlaze-D film softens the redirected light by diffusing it, while reducing the ability to see the detail of objects through the window.

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