

DOCKETED

Docket Number:	13-CCEJA-01
Project Title:	Prop 39 - California Clean Energy Jobs Act
TN #:	214472
Document Title:	Doreen Eyman Comments: Redirecting Lighting with 3M Film
Description:	N/A
Filer:	System
Organization:	calcoastwindowtinting
Submitter Role:	Other Interested Person
Submission Date:	11/12/2016 1:45:25 PM
Docketed Date:	11/12/2016

Comment Received From: Doreen Eyman

Submitted On: 11/12/2016

Docket Number: 13-CCEJA-01

Redirecting Lighting with 3M Film

Reduces glare and discomfort caused by direct sunlight on occupants

• Redirects natural light as much as 40 ft. or more into the building

• Extends daylight zone up to 8 ft. into the interior for every 1 ft. of treated window • Can provide up to 52% lighting energy savings compared to baseline usage

• Can provide savings of up to 1.5 kwh/sq.ft. of floor area

Simple, effective, daylighting solution.

Compared to existing light reflecting strategies, 3M Daylight Redirecting Film is easily integrated into new or existing windows. It requires no extra hardware or infrastructure, and little to no additional maintenance or special cleaning. It works at all times of the day, even when the sun is at a low angle. Plus, it's more cost effective than many existing daylighting solutions.

Additional submitted attachment is included below.



Optimizing natural light in buildings helps provide a better experience for all of us.

3M™ Daylight Redirecting Film is a simple, effective daylighting solution which comfortably brings natural light deeper into buildings.

Buildings with abundant natural light have been shown to:

- ▶ Increase employee productivity
- ▶ Boost retail sales
- ▶ Improve student test scores
- ▶ Decrease rates of absenteeism
- ▶ Improve patient recovery times
- ▶ Reduce energy costs



See the world in a different light
with 3M™ Daylight Redirecting Film



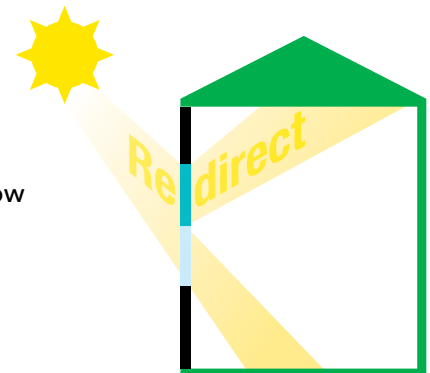
3M™ Daylight Redirecting Film installed in Clerestory Glass — Sacramento, CA

Naturally brighten your day.

3M™ Daylight Redirecting Film is designed to move excess light close to the window and redirect it deeper into the building to increase the daylighting penetration. Bringing natural light deeper into the building helps provide the many benefits of natural light for more occupants as well as helping reduce the need for artificial lighting which can save energy.

In addition, 3M Daylight Redirecting Film:

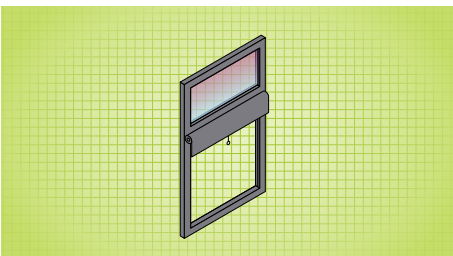
- ▶ Reduces glare and discomfort caused by direct sunlight on occupants
- ▶ Redirects natural light as much as 40 ft. or more into the building
- ▶ Extends daylight zone up to 8 ft. into the interior for every 1 ft. of treated window
- ▶ Can provide up to 52% lighting energy savings compared to baseline usage
- ▶ Can provide savings of up to 1.5 kwh/sq.ft. of floor area



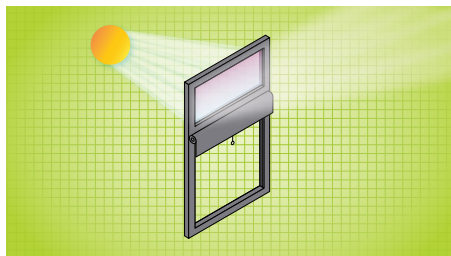
Simple, effective, daylighting solution.

Compared to existing light reflecting strategies, 3M Daylight Redirecting Film is easily integrated into new or existing windows. It requires no extra hardware or infrastructure, and little to no additional maintenance or special cleaning. It works at all times of the day, even when the sun is at a low angle. Plus, it's more cost effective than many existing daylighting solutions.

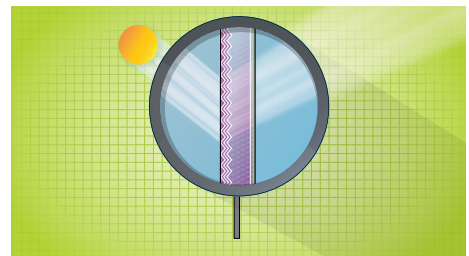
How it Works



3M Daylight Redirecting Film is installed in the upper portion of the window.



Daylight is redirected upwards towards the ceiling allowing natural light to comfortably penetrate deeper into the building.



Made of micro-structured prisms, the film optically redirects over 80% of the daylight upward and diffuses light to be more evenly distributed.

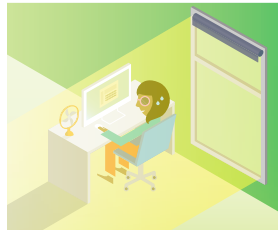
Increase natural light and comfort.

Clear Glass Windows



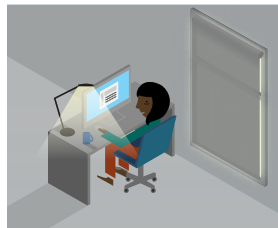
When Shades are Open*

Direct sunlight can beam into the space at low angles, causing glare and discomfort.



When Shades are Closed*

Shades are closed to block uncomfortable direct sunlight, which also decreases natural light in the space.



3M™ Daylight Redirecting Film

Installed in Upper Clerestory Windows



When Shades are Open*

The light from the upper glass is redirected to the ceiling, increasing natural light and decreasing glare in the space caused by direct sunlight.



When Shades are Closed*

Even when the vision glass shades are drawn, natural light continues to penetrate into the space through the clerestory glass with 3M Daylight Redirecting Film.

Case Studies

Six U.S. Department of Energy Facilities

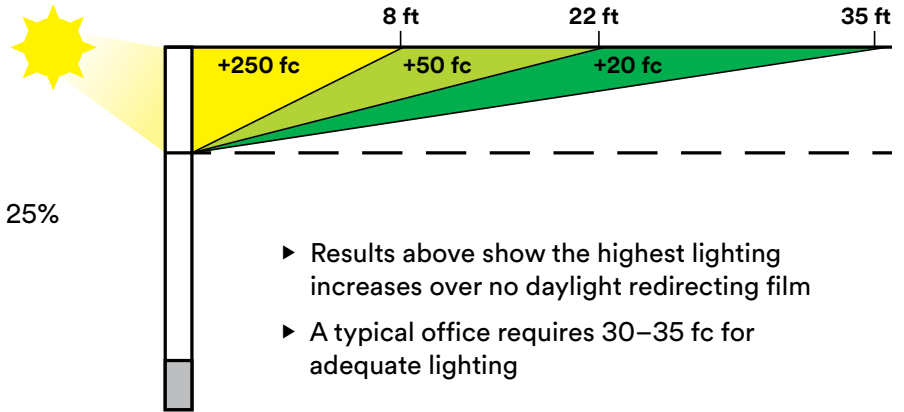
ESTCP Program

Locations

- ▶ Washington, California (2), Texas, Virginia, Rhode Island

Results

- ▶ Increased the naturally lit floorspace by 25%
- ▶ Up to 52% lighting energy savings



Sacramento Municipal Utilities Department

Location

- ▶ Sacramento, California

Comparison

- ▶ 3M™ Daylight Redirecting Film
- ▶ Daylight Redirecting Blinds
- ▶ Light Shelf

Results

- ▶ 3M Daylight Redirecting Film outperformed redirecting blinds and light shelves



3M™ Daylight Redirecting Film (Daylighting Zone)



Daylight Redirecting Blinds (Daylighting Zone)



Light Shelf (Daylighting Zone)

Daylit Zone	Illuminance (footcandles)	Illuminance (footcandles)	Illuminance (footcandles)
1	74.0	57.5	58.9
2	45.1	36.4	37.0
3	26.7	23.9	16.0

Handheld illuminance readings on a sunny, winter day with electric lighting entirely off (Jan. 7th, 2012, 11:30 am).

Design with Daylight

Looking to do something unique with your building? 3M Daylight Redirecting Film can be applied into any design of your choosing. Apply a fritted, striped, or even diamond pattern and design with daylight in mind!

Learn more at 3M.com/daylighting

Warranty and Limited Remedy: 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER EXPRESS OR IMPLIED WARRANTIES OR CONDITIONS, INCLUDING ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If the 3M product does not conform to this warranty, the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price. **Limitation of Liability:** Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted.



Renewable Energy Division
3M Center, Building 235-2S-2
St. Paul, MN 55144-1000
3M.com/daylighting

3M is a trademark of 3M.
Used under license in Canada.

Please recycle. Printed in the U.S.A.
© 3M 2016. All rights reserved.
98-0150-0902-4