

Real
DAYLIGHTING
solutions
as distributed by **NORBEC™**

Port Hawkesbury Civic Centre • Architect - Ojolick Associates



TAMING the SUN

Harnessing the sun's abundant light is a challenge. Avoiding glare, solar heat gain and uncontrolled illumination patterns are a designer's aspiration. Designing beautiful, functional and comfortable spaces for occupants has been riddled with complexities and expense.

"The Challenge" has been solved with a resilient, cost effective and elegant solution ... Solera® & SoleraWall®



ARCHITECTURAL DAYLIGHTING

Daylighting is a powerful design element. Proper execution results in sustainable and energy efficient buildings. Daylighted buildings command higher rental and resale values.

Full spectrum diffused light enhances the visual and psychological experience. Research demonstrates that well daylighted spaces also impact occupant's Circadian rhythms that trigger positive physiological responses:

- children learn faster
- workers are more productive
- retail sales increase
- occupant health is improved

www.advancedglazings.com/studies

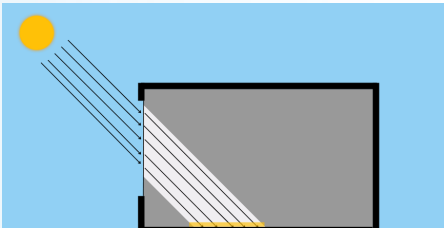


Kirkwood College • Architect – Neumann Monson

DAYLIGHTING with WINDOWS

The placement of vision glass on buildings exclusively, is not effective daylighting. Why?

Sunlight travels in straight lines through windows and strikes the floor. The light is absorbed and radiates heat instead of illuminating the interior space evenly.



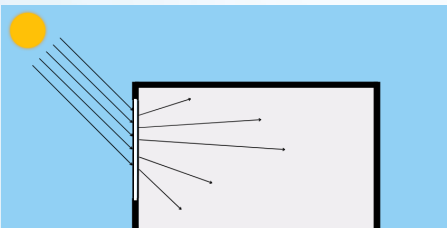
The result:

- glare
- thermal discomfort
- poor light penetration
- increase solar heat gain

The outcome is the deployment of blinds, which tend to stay down. This defeats the purpose of windows.

DAYLIGHTING with SOLERA® & SOLERAWALL®

The alternative is to use a wide angle diffusing translucent, which lifts a significant portion of the light up from the floor - distributing it evenly throughout the space. The net effect is a deep penetration of natural full spectrum light, without excessive thermal variance and the harmful effects of glare.



NOT ALL TRANSLUCENTS are EQUAL

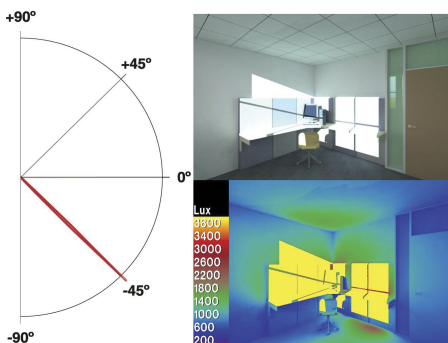
Light diffusing glazings are powerful elements for designers who wish to bring high quality natural light into interior spaces. Translucent glazings vary greatly in their ability to diffuse light. Specifying the right glazing, can be critical to the success of a project.

Light diffusing power (LDP) is a measurement that objectively compares the light diffusing properties of various glazing materials. The polar plots, photos and false color renderings below, demonstrate how various glass options diffuse light.

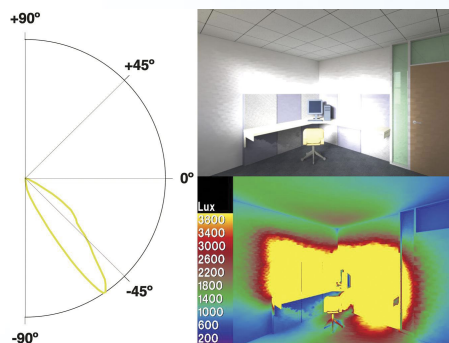
Clear glass, as well as narrow angle light diffusers, such as Acid Etched and White Laminated glass, creates excessive illumination and high contrast (glare)

SOLERA® & SoleraWall® unlike other translucent, is a wide angle light diffuser (near perfect LDP). By redirecting equal amounts of light in all directions, a diffused and comfortable full spectrum light is achieved.

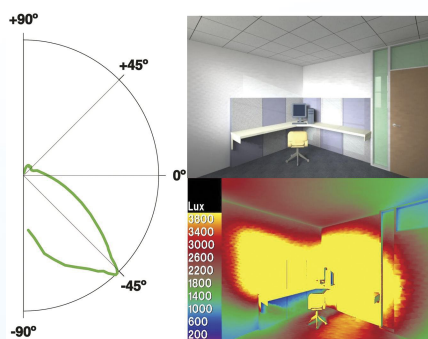
SOLERA® & SoleraWall® can be specified with a range of visual light transmittance and diffusion.



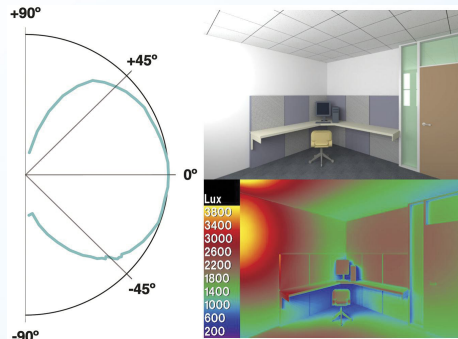
Clear Glass
(no light redirection)



Acid Etched
(narrow angle light diffusion)



White PVB laminate
(narrow angle light diffusion)



SOLERA®
(wide angle light diffusion)

IEWS & DAYLIGHTING

Views and daylighting are different objectives and require different tools.

- Views provide occupants with a visual connection to the outside world.
- Daylighting allows natural full spectrum light to penetrate a space. Diffused evenly it achieves comfortable light levels for occupants.

Use vision glass for views and SOLERA® or daylighting. The two work hand in hand and integrate seamlessly into the same framing system. Advanced Glazings Ltd. provides daylighting simulations to determine the optimal configuration of vision glass and SOLERA®

Nobel Halls • SUNY Stonybrook – Goshow Architects



CONTROLLING THERMAL IMPACT

As energy and building codes become stricter, the ability to design extensively with glass has become more challenging. High performance glass solutions have historically been expensive, unstable and complex. The SOLERA® line of products, allows the ability to engineer more effectively the fenestration components to create superior building performance for total building envelope.

To insulate, a material must address multiple modes of heat transfer. Our technologies include light diffusing glass veils which diffuses light and control or solar heat gain coefficient.

The patented transparent InsolCore® insulation disrupts the convection cycle of heat transfer. This provides substantial and permanent improvement in U value (R value) over traditional Low-e and gas (Argon, Krypton) technologies.

In order to provide the greatest improvement in thermal performance, the conduction transfer of heat, must be addressed. Advanced Glazings Ltd. has pioneered a method to stabilize aerogel in an insulated glass unit.



Detroit School of Arts
Architect - Hamilton Anderson Associates



Nobel Halls at SUNY Stony Brook utilizes both horizontal and vertical expanses of SOLERA® T in harmony with insulated metal panels to achieve holistic design solution and has achieved LEED Gold Certification. This unique structure delivers SOLERA®'s trademark combination of engineered natural light and thermal excellence, while delivering a striking compliment to its' surroundings, making a bold architectural statement, both day and night.

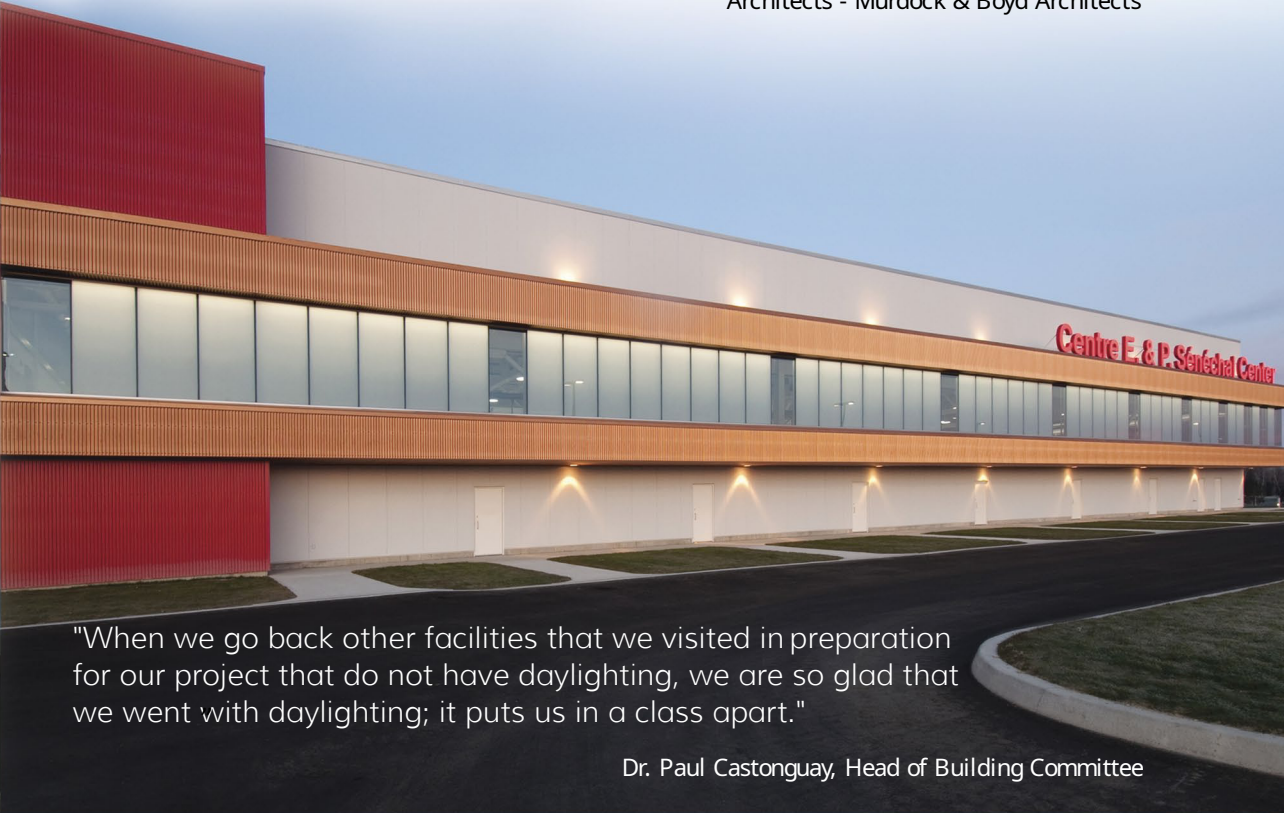
Architects - Goshow Architects





Centre E&P Senechal Center proves that when it comes to daylighting, you can achieve both form and function on a budget with SOLERA®. SOLERA® was placed at the level of the walking track which surrounds the rink and fitness gym. Monica Adaire, Project Architect shares, "Advanced Glazings, Ltd. proved to be more than just a product manufacturer, but also a daylighting design partner."

Architects - Murdock & Boyd Architects



"When we go back other facilities that we visited in preparation for our project that do not have daylighting, we are so glad that we went with daylighting; it puts us in a class apart."

Dr. Paul Castonguay, Head of Building Committee

DAYLIGHT SIMULATION STUDIES

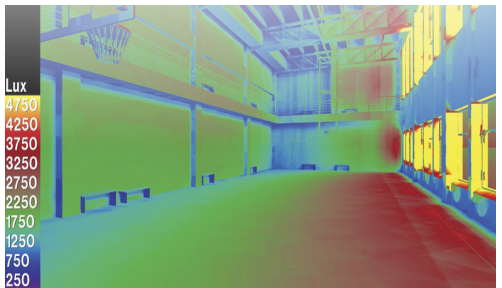
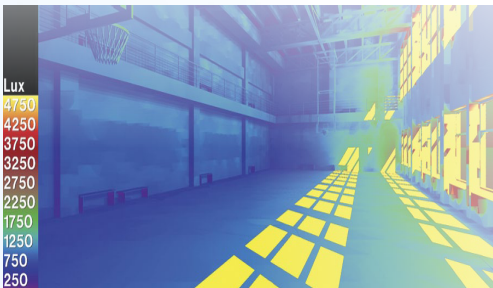
The only way to understand the implications of daylight on a building design is to either build physical models of the building and study it in a heliodon, or to generate computer models of the building. It is critical to model the space properly to predict the performance of an engineered solution.



9:30 AM - 21 June. Vision Glass



9:30 AM - 21 June. Solera®



The radiance daylighting simulations above, demonstrates how SOLERA® diffuses natural light thereby reducing contrast (glare) and increasing the overall ambient light level.

Advanced Glazings Ltd. provides complimentary daylighting simulations in a report format.

These detailed reports will:

- educate project stakeholders
- demonstrate design intent and daylighting value to your client
- provide your lighting designers with valuable data
- maximize integration between natural and artificial lighting

SOLERA® LINE OF PRODUCTS

SOLERA® is designed to deliver superior daylighted spaces and a range of thermal insulation. Our product lines are engineered to be highly configurable, allowing control of:

- light diffusion and transmittance
- control of solar gain
- thermal insulation
- sound transmittance
- aesthetics
- safety

SOLERA® is designed to be UV stable and has a warranty against color shift. The fundamental components of SOLERA® units are:

a) Glass

Available choices include (but are not limited to) color of glass, composition (Heat Strengthened, Tempered, Laminated) and thickness.

b) Glass Light Diffusing Veils

Various combinations of veil choices provide control of diffusion, visual light transmittance and solar gain.

SOLERA® is designed to fit into standard curtain wall, storefront, window and skylight systems, which makes it ideal for new construction and renovations.

45Drives
Architects - Murdock & Boyd Architects



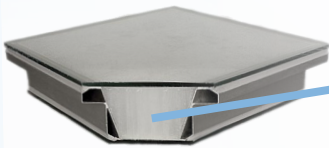
SOLERA® +Aerogel®

SOLERA® + Aerogel® is a daylighting strategy that dramatically improves thermal performance making an extraordinary product even better.

The inclusion of Aerogel® in daylighting systems virtually eliminates the historical trade-off of insulation vs. natural light by providing 3 to 6 times the thermal performance.

The unique properties of SOLERA® + Aerogel® enable:

- superior thermal efficiency
- significantly reduced transmitted noise
- exceptional glare reduction
- unmatched durability



Insolcore®
Stabilizing Aerogel®



Joggins Fossil Cliff Museum - WHW Architects

SOLERA® + Aerogel® R25

Nominal thickness	4" (103mm)*
Visual Light Transmittance (VLT)	17% - 19%*
Shading Coefficient (SC)	0.15 - 0.17*
Solar Heat Gain Coefficient (SHGC)	0.18 - 0.20*
U-Value	0.04 Btu/hr·ft ² ·°F**
U-Value (SI Units)	0.22 W/m ² ·K**
Sound Transmittance Class (STC)	may exceed 52

SOLERA® & SOLERAWALL® + Aerogel® R18

Nominal thickness	3" (76.2mm)
Visual Light Transmittance (VLT)	7% - 32%*
Shading Coefficient (SC)	0.08 - 0.36*
Solar Heat Gain Coefficient (SHGC)	0.07 - 0.30*
U-Value	0.055 Btu/hr·ft ² ·°F**
U-Value (SI Units)	0.31 W/m ² ·K**
Sound Transmittance Class (STC)	may exceed 52

SOLERAWALL® + Aerogel® R12

Nominal thickness	3" (76.2mm)
Visual Light Transmittance (VLT)	15% - 34%*
Shading Coefficient (SC)	0.17 - 0.38*
Solar Heat Gain Coefficient (SHGC)	0.14 - 0.32*
U-Value	0.083 Btu/hr·ft ² ·°F**
U-Value (SI Units)	0.47 W/m ² ·K**
Sound Transmittance Class (STC)	may exceed 52

SOLERA® + Aerogel® R9

Nominal thickness	1.75" (44.45mm)
Visual Light Transmittance (VLT)	9% - 40%*
Shading Coefficient (SC)	0.10 - 0.44*
Solar Heat Gain Coefficient (SHGC)	0.09 - 0.37*
U-Value	0.11 Btu/hr·ft ² ·°F**
U-Value (SI Units)	0.61 W/m ² ·K**
Sound Transmittance Class (STC)	may exceed 52

SOLERA® & SOLERAWALL® + Aerogel® R5

Nominal thickness	Solera 1" (25.4mm) SoleraWall 3" (76.3mm)
Visual Light Transmittance (VLT)	10% - 45%*
Shading Coefficient (SC)	0.11 - 0.50*
Solar Heat Gain Coefficient (SHGC)	0.10 - 0.42*
U-Value	0.2 Btu/hr·ft ² ·°F**
U-Value (SI Units)	1.14 W/m ² ·K**
Sound Transmittance Class (STC)	may exceed 52

SOLERA® R3

Nominal thickness	1" (25.4mm)
Visual Light Transmittance (VLT)	23% - 45%*
Shading Coefficient (SC)	0.25 - 0.50*
Solar Heat Gain Coefficient (SHGC)	0.21 - 0.42*
U-Value	0.33 Btu/hr·ft ² ·°F**
U-Value (SI Units)	1.87 W/m ² ·K**
Sound Transmittance Class (STC)	may exceed 52

* Subject to glass and veil combination.

** Center of Glass (CoG) Values.

Maximum sizes 5' x 12' (1,524 mm x 3,658 mm)

® Aerogel is a registered Trademark of Cabot Corporation

SOLERA®

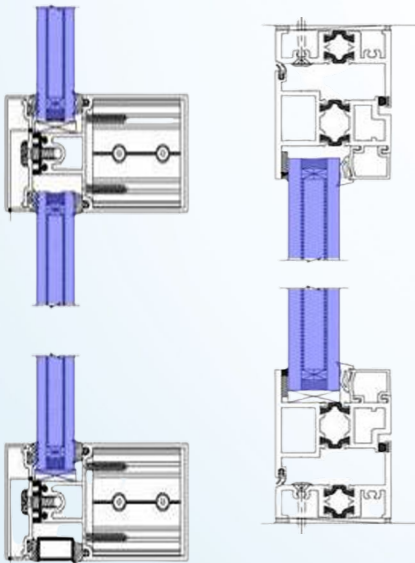
Insulated Glass Unit construction

- Glass exterior / spacer / sealant
- Your choice of glass to match aesthetics and performance needs
- Special elements in interior determine:
 - Optics (Light diffusing power, visible light transmittance (VLT) and solar gain (SHGC))
 - Insulation value

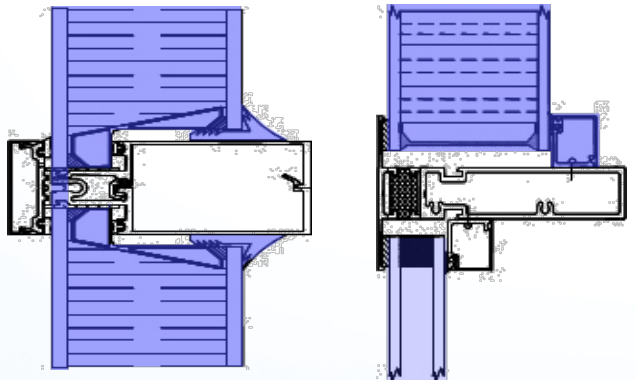
Four nominal thicknesses:

- 1" units (R3 and R5)
- 1.75" units (R9)
- 3" units (R5, R18)
- 4" units (R25)

1" Nominal Units – R3 to R5



1.75" to 4" Nominal Units R5 to R25



SOLERAWALL®

Combine vision and engineered light diffusion in the same system to provide views and exceptional quality daylight.

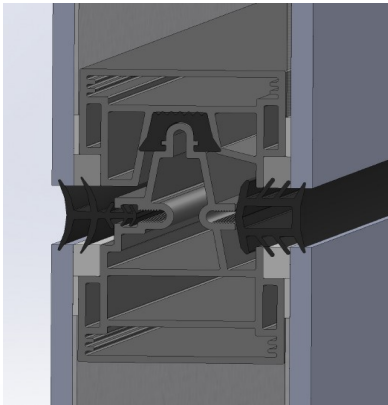
Tongue and Groove Glass Units

Clad Directly Over Primary Structure

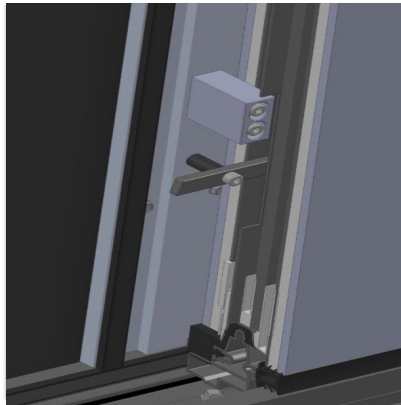
- Flush and narrow sight lines – no external mullions
- Rainscreen Construct

Eliminates the traditional framing system

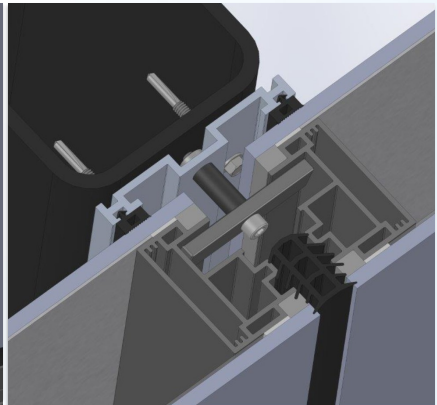
- Saves time in install
- Saves \$\$\$\$
- Improves thermal performance



Horizontal Detail



Sill Intersection



Vertical Perspective



Holland Performing Arts Center, Architect – Polshek Partnership Architects, LLP



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