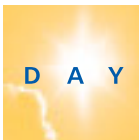


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THE BIMONTHLY NEWSLETTER OF THE DAYLIGHTING COLLABORATIVE

www.daylighting.org

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DAYLIGHTING
collaborative®

Thank you to the members who support the Daylighting Collaborative's mission of **lighting every building using the sky**:

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INTEGRATING NEW TECHNOLOGIES IN TRANSLUCENT DAYLIGHTING

By David M. Miller, *President of Duo-Gard Industries Inc.*

Architects, engineers, interior designers and lighting experts continue to search for ways to incorporate more daylighting for greater building sustainability. They're finding new technologies that contribute unprecedented energy efficiency and economy when applied with a building-integrated approach.

These technologies include:

- translucent glazings that diffuse light as they add thermal value
- insulating aerogels that double the glazing's thermal values
- spectrally selective coatings that reduce heat loads while collecting and transferring solar heat
- transparent photovoltaic modules that deliver 3x concentration with no tracking systems
- co-functional LED-based systems that transform translucent luminosity into true illumination

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TRAINING UPDATE

The Collaborative for High Performance Schools (CHPS) has various seminars available on designing high performance schools.

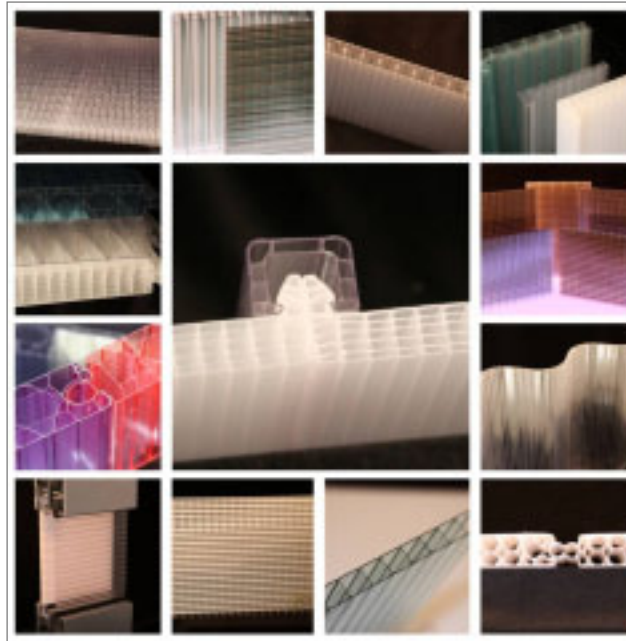
Basics of Daylighting in a Green Environment from Southface provides an introduction to the use of daylighting in commercial spaces.

Lighting Control & Design offers continuing education courses for professional development credit for Architectural (AIA/CES) or Engineer license renewal.

UPCOMING EVENTS

The LIGHTFAIR Daylighting Institute is scheduled for May 10–11, 2010 at the Las Vegas Convention Center in Las Vegas, Nevada. This two-day conference is followed by the regular LIGHTFAIR Tradeshow and Conference May 12–14, 2010. Topics at this year's Daylighting Institute include: Designing Photoresponsive Control Systems, Daylighting Simulation Tools, Daylighting Metrics, Design of Electric Lighting Controls for Daylighting and much more. Visit www.lightfair.com for more information on the program and registration.

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Such technologies can be used in skylights and walls that perform multiple functions, creating enhanced sustainability and contributing to LEED certification.

These advances result from the development of high-performance polycarbonate glazing technology. Polycarbonate glazing offers building owners and occupants the benefits of diffuse daylighting without the burdens of solar heat gain and glare. Results are lower heating, cool-

ing and lighting costs plus improved interior comfort for greater productivity. And these results often are achieved at initial costs one-third to one-half less than traditional systems and provide exceptional life-cycle savings.

ENERGY EFFICIENCY

Multiwall polycarbonates typically range from 6mm to 40 mm (7 layers) thick. Within this range, they provide U-value down to 0.19, R-value up to 5.26 and diffuse light transmission up to 68 percent. Add translucent aerogel insulation and the U-value can go to 0.10, R-value to 10 and light transmission to 33 percent.

Double-glazed systems can increase both thermal values and security. A new transparent, spectrally selective low-E coating applied to the interior cells can reject infrared rays by 40–95 percent, UV rays to 99 percent, solar energy from 40–85 percent, while maintaining light transmission from 25–65 percent. This offers significant HVAC savings. The low-E coating enhances U-values and also reflects heat back into buildings without allowing it to escape.

LIGHT TRANSMISSION

Diffuse daylighting with translucent polycarbonates in skylights, curtain walls and clerestories eliminates the distracting, uncomfortable glare and hot spots that

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NEW MEMBER

The Daylighting Collaborative welcomes a new member!

For more than 60 years VELUX has been engineering and manufacturing skylights that withstand the harshest of elements. VELUX holds more than 300 patents in roof window and skylight design.

VELUX offers residential, commercial and tubular skylights that are leak-proof, energy efficient, and code compliant. A full range of light control options are available including solar blinds, RF remote controls, and automation systems. Local support is available across the United States to help with everything from design to installation.

We're grateful to all our members for their generous support and collaboration in developing and delivering the resources the building design community needs to light every building using the sky.

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result from direct daylight. That's critical when there's a computer on every desk or a classroom where every inch of usable space counts. Translucent polycarbonates allow a wide range of visible light transmission, depending on the tint and thickness chosen. Typical ranges are 80–60 percent, spreading user-friendly daylight evenly throughout a space and projecting it 30 percent deeper into the space. Translucent interior walls and partitions can continue the flow of diffuse natural light while maintaining privacy.



DESIGN AND ENGINEERING FLEXIBILITY

Gaining energy efficiency doesn't mean sacrificing design and engineering flexibility. Shatterproof, multiwall polycarbonates are 200 times stronger than glass at only 1/6th the weight, enabling designs with wider spans and lighter supports. Cold forming for curves and accents is easy. Colors, textures and structural capacities encompass a wide range, and sheets run from standard 4'x 8' up to 29' long with options up to 48' long. Custom systems can incorporate glass sections for visibility and ventilation in prime systems for new construction, full replacement for retrofit or overglazing without removal of existing windows and skylights.

WEATHERIZATION AND FIRE SAFETY

UV protection is coextruded right into the sheet for exceptional weather resistance, guarding against color change and color loss. Most multiwall polycarbonates are

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DAYLIGHTING COLLABORATIVE MEMBERSHIP

Join the Daylighting Collaborative and connect with the design and construction professionals who need your products and services to deliver sustainable, energy efficient, carbon neutral buildings. Membership will connect you to more than 10,000 highly motivated and qualified customers who are looking for products and technical solutions. Align your organization with an objective, nationally-known resource for design professionals who want to incorporate daylighting into their designs. Contact Peggy Heisch at 608.238.8276 x139 or pheisch@ecw.org for more information.

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CC1—Class A rated for fire safety, and the material is self-extinguishing when the flame source is eliminated. Burning produces holes that allow gases and smoke to escape the building.

ARCHITECTURAL AESTHETICS AND ILLUMINATION

Today's high performance polycarbonates are complemented by colors with architectural appeal, ranging from blues and greens to the metallic sheen of silver. They also come in textures that range from satin matte to hammered crystal. One of the most



appealing advantages is the illumination possibility with this translucent material. Translucent walls can integrate dynamic color-changing backlighting and cavity lighting engineered with custom low-voltage LED light grids that add dramatic design effects for both interior and exterior applications, creating a co-functional luminous element that's also a true primary illumination source.

SPECIAL CONSIDERATIONS

Along with the advantages of multiwall polycarbonates come some cautions. Proper framing is critical. For maximum effectiveness, the material requires framing systems specifically engineered to accommodate its expansion and contraction by allowing it to float in the frame.

The potential for using high performance polycarbonates for daylighting buildings is great. Polycarbonates are also being combined with building-integrated photovoltaics (BIPV). This emerging technology meshes translucent polycarbonates with transparent solar modules to achieve lower-cost systems that generate electricity and provide daylighting with minimal heat gain. The first of these products is expected to reach the market by mid-2010. However, achieving all the advantages of emerging daylighting technologies will require innovative partnerships between building designers, product designers and product manufacturers. ■