natural light or energy efficiency?  

...BOTH

Over the past decade, shifting political policies, increasing governmental restrictions, and energy-conscious building codes have all attributed to a heightened awareness of the impact that the building and construction industry has on the environment. This has significant implications for key decision makers as they look to create new, or renovate existing, buildings. For someone who distributes glazing materials, the most important question that has been raised is “natural light or energy efficiency?” It is thought that you can bring in sunlight at the expense of high amounts of lost energy or create a building without any windows, skylights, sidelights, or translucent wall assemblies at the expense of making it feel like solitary confinement in Cell Block C. The fact of this matter is that the two aren’t mutually exclusive. The answer to “natural light or energy efficiency?” ... BOTH.

AmeriLux International is a distributor of a wide range of polycarbonate sheet, PVC and steel products. They pride themselves on being able to provide the building and construction markets with quality products, exceptional customer service, and relevant information about their product lines. Recently, AmeriLux has been providing its strategic partners with information about how their products can be used to let daylight into buildings and achieve high energy performance standards. They’ve provided stakeholders with information on green building practices, LEED certification criterion, sustainable construction initiatives, and the impact that their products have on the environment. All of this is done because they truly believe that by using their products, architects and project owners can choose to let natural light into buildings AND minimize their carbon footprint.

The architects who worked on Seattle’s Building 115 “incorporated Lumina™ aerogel...to further enhance energy performance and reduce sound transmission.”

Hannaford Brothers Store in Augusta, ME is the first LEED® Platinum Supermarket in the U.S. See how the use of Lumina™ aerogel technology made this project a success.
The Solution...

Lumira™ aerogel insulated, multi-wall polycarbonate panels

The use of Lumira™ aerogel insulated, multi-wall polycarbonate panels effectively eliminates the historical trade-off of insulation vs. natural light in daylighting applications. Previously called Nanogel®, Lumira™ aerogel is a solid comprised of granular silica particulates and is more than 90% air. This material is completely recyclable, eco-friendly, non-combustible, and Cradle-to-Cradle certified. It is a lightweight insulation and daylighting solution that repels water, retains its properties under compression, and can enhance design options and aesthetics. Although aerogel has been around for over 70 years, in 2003, Cabot Corporation began commercialized production of Lumira™.

Multilayer polycarbonate systems used for daylighting can be enhanced by the inclusion of Lumira™ aerogel. Lumira-filled polycarbonate panels can provide cost effective insulation, improved quality of light, sound dampening, and design flexibility. Lumira™ aerogel diffuses light evenly throughout the structure which creates a softer, improved source of light. Acoustic STC values, which are increased in structural polycarbonate with aerogel, create an improved sound barrier. These factors, when combined with the diverse nature of multiwall polycarbonate in daylighting and insulation systems, allow architects and building owners to incorporate natural light without having to worry about lost energy and the high costs associated with it.

The aerogel produced by Cabot Corporation is covered by a series of domestic and international patents and licenses. This Information is provided as a convenience and for informational purposes only. No guarantee or warranty as to the accuracy or completeness of such information is made. This Information may contain inaccuracies, errors or omissions and Cabot Corporation disclaims all warranties expressed or implied, including merchantability or fitness for a particular purpose as to (i) such information, (ii) any product or (iii) intellectual property infringement. In no event is Cabot Corporation liable for any damages whatsoever in connection with the use of or reliance on such information or any product to which it relates.

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**Tysen Gannon | LEED AP**
TGP Product Consultant

Lumira™ offers architects and designers the opportunity to dramatically enhance the thermal performance of daylighting systems while preserving a significant amount of visible light transmission and promoting good diffusion throughout interior spaces. Polycarbonate panels filled with Lumira are an excellent solution for enhancing products like channel glass or skylights, where aerogel insulated polycarbonate inserts or laylights can be readily integrated with minimal modifications to the base product. Polycarbonate panels can offer manufacturers an effective means of integrating aerogel insulation into their products with minimal development costs. The use of Lumira™-insulated polycarbonate panels in these types of systems can help to achieve the strict prescriptive performance requirements that are appearing in some markets or can generally elevate the R values of these types of assemblies, promoting energy savings and lower operating costs for owners.

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**natural light & energy efficacy**

**Partner up.**

Since 2009, Wasco® Skylights and AmeriLux International have partnered up in their efforts to promote the use of natural light in the building and construction industries. The structured polycarbonate sheet that AmeriLux supplies for a line of Wasco unit skylights diversifies their product mix and offers their customers design flexibility.

“Amerilux is a strategic partner for Wasco Products, Inc.,” says Sara Havard, Chief Operations Officer for Wasco. “They provided exceptional service as a distributor of polycarbonate product as well as provide a high level of professional product and technology expertise unmatched by any other polycarbonate distributor. Amerilux has developed automated equipment to meet the needs of Wasco and our customers. Their continued investment in technology and product is a sign of the commitment they have to our partnership.”

Both companies continue to work with members of the architectural, building and construction communities to promote daylighting concepts and the impact aerogel-filled polycarbonate panels can have on achieving energy efficacy.

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**Iona County Courthouse, Grand Rapids, MI**

The Iona County Courthouse project in Grand Rapids, MI was completed in 2010. The customer was looking to replace some older skylights but was concerned about glare and hot spots. Wasco® Skylights was able to offer their Thermalized Barrel Vaults with Lumira™-insulated polycarbonate panels. This offered the customer a skylight with exceptional thermal performance as well as the diffused of natural daylight they required.
Hannaford Brothers Store, Augusta, Maine
The First LEED® Platinum Supermarket in the U.S.

Lead Architect: Rick Ames, AIA, LEED® AP
LEED® Consultant: Gunnar Hubbard, AIA, LEED® AP, President, Fore Solutions
Daylighting Consultant: Dane Sanders, EIT, LEED® AP, Clanton & Associates

CHALLENGE:
To supply sufficient diffused natural light to key sections of a 50,000 square foot supermarket while significantly reducing energy costs.

SOLUTION:
Wasco Skylights’ Nanogel® Thermal Units – the highest performing daylighting product available on the market today.

From the start, architect Rick Ames of Boston-based Next Phase Studios envisioned the newly opened Augusta Hannaford store, the first LEED® Platinum supermarket in the U.S., as a day lit/low energy building. In order to realize his design, Ames and daylighting consultant Dane Sanders of Clanton & Associates, Inc. in Boulder, employed a number of techniques. A key strategy was the use of (54) 4’x4’ Wasco Nanogel® Thermal Units for both general and task lighting and to achieve optimal daylighting conditions in critical areas of the store.

Nanogel® Thermal Units are double-paned polycarbonate glazed skylights insulated with a layer of translucent Nanogel, a nanomaterial that is the best insulating solid on the planet and the lightest. Nanogel-enhanced skylights provide a high insulating value and an excellent Solar Heat Gain Coefficient. Up to six times as energy efficient as conventional skylights, they provide an abundance of glare-free, full spectrum, diffused light which studies show have a positive effect on worker productivity and can boost sales by as much as 40%.

Nanogel® Thermal Units are UV stable, reduce sound transmissions by 25–70%; increase acoustic performance and are completely water resistant. They also meet the OSHA standard for skylight fall protection. The prestigious design firm, MBDC, has determined that Nanogel is consistent with the MBDC Cradle to Cradle Design philosophy.

Ames and Sanders chose Nanogel skylights to illuminate service and delivery corridors where they report that on most days there is limited need for artificial light. They also placed an array of the skylights down the center of the store to supply sufficient general lighting and installed others to highlight specific displays. Most of the units were used to light the perimeter areas, which Sanders claims are the most profitable, and where Hannaford displays its own brand products, meat and produce. “The light in these perimeter areas must provide good color rendering,” said Sanders. “That’s essential for fruits, vegetables, meat and seafood. The company prides itself on the freshness of these products and so you want to show them – literally – in their best light.” He also noted that the diffuse quality of the light transmitted by the Nanogel skylights protects these products from harsh sunlight that could speed their deterioration.
Case Study

Ames is expecting this store to utilize significantly less energy than a typical supermarket of comparable size. “We chose the Nanogel Thermal units because we liked the balance of thermal characteristics and light transmittance,” he said. “You get plenty of diffused light with these skylights and they give you an R-value approaching that of an exterior wall. That’s really an unbeatable combination. We’re extremely pleased with the results and we know our client is as well.”

Rick Ames, AIA, LEED AP, Lead Architect
Rick Ames is a principal of Next Phase Studios (NPS), a collaborative architectural design firm based in Boston, Massachusetts. NPS has been recognized with numerous design and performance awards and collectively has worked throughout the world. The firm’s work ranges from complete design services to consulting, design/build, prototyping, workshops, research and grant writing. Rick has an undergraduate degree in Studio Art, and a MArch from MIT. He has been practicing architecture and design/build with Next Phase Studios since graduating in 1990.

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Gunnar Hubbard, AIA, LEED AP, LEED Consultant
Gunnar is the Principal and Founder of Fore Solutions, a Portland, Maine-based architectural firm specializing in the design of high-performance green buildings. Gunnar holds a MA of Architecture from the University of Oregon and a B.S. in Environmental Studies from the University of Vermont. He was a LEED faculty for four years and now teaches green building workshops around the world. The firm’s work ranges from complete design services to consulting, design/build, prototyping, workshops, research and grant writing. Rick has an undergraduate degree in Studio Art, and a MArch from MIT. He has been practicing architecture and design/build with Next Phase Studios since graduating in 1990.

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Dane Sanders, EIT, LEED AP, Daylighting Consultant
Dane began work with Clanton & Associates as a lighting designer in 2002. He received a Bachelor of Science degree in Architectural Engineering, Illumination Emphasis from the University of Colorado at Boulder. His project experience includes exhibits, museums, visitor centers, schools, hospitality, retail, and exterior work. Several of his projects are LEED certified and registered including the Tom Ridge Environmental Center at Presque Isle State Park in Pennsylvania. Dane is a member of the Illuminating Engineering Society of North America and the US Green Building Council.

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Project: Building 115  
Location: Seattle, WA  
Architect: Graham Baba Architects  
Product: Pilkington Pro“lit™ with Lumira™ aerogel insulation
In Seattle’s Fremont neighborhood, a collage of vertically oriented, transparent channel glass strips run up the street façade of a new, three-story building. This unexpected and artistic structure is Building 115, a mixed-use residential building developed by Dave Boone, Dave Boone Construction, and designed by Graham Baba Architects of Seattle.

Constrained by zoning requirements, the building makes efficient use of its space by extending up rather than out. Concrete masonry units form the sides of the building, while the bay—a linear sequence of channel glass slots on the front—stretches into the sky. Strategically placed windows and cantilevered floor slabs add dimensionality to the glazed front, which thins as it extends upward to create the illusion of length.

The top portion of the bay conceals a deck and residential unit from the busy street. On the interior, diffuse daylight streams through the channel glass to illuminate the bottom two floors—a bicycle shop and workspace. At night, the bay transforms into a backlit façade.

For Boone, the inspiration for the multi-faceted building came from a desire to consolidate the home, workspace and retail environments in a visually engaging, yet functional fashion: “Fremont is a great neighborhood that describes itself as the “The Center of the Universe” with a lot of eclectic, publicly accessible art. I wanted a building that would contribute to its funky, mixed-use district,” says Boone. “A utilitarian place that is a home, an office, a workshop and a retail space while offering something uplifting to the everyday foot and street traffic as they pass by.”

In implementing Boone’s vision, one of the challenges for Graham Baba Architects was to find a structurally stable, yet aesthetic material that allowed building occupants to engage with the outside environment.

“We wanted to create a building that would visually interact with the street activity. But in order for the space to be livable, we needed to balance transparency with privacy,” says Jim Graham, principal, Graham Baba Architects. “We needed a material that would allow us to let in as much light as possible during the day and act as a lantern at night.”

The architects found their solution with Pilkington Profilit™ channel glass from Technical Glass Products (TGP), Snoqualmie, Washington. The linear, “U”-shaped, cast-glass channels are self-supporting and mounted in an extruded metal perimeter frame. In the case of Building 115, framing holds the vertical mullions in place on cantilevered floor slabs to add dimension to the uniform surface.

The cast-glass channels are available in a variety of colors and textures with varying translucency, which allows for the passage of natural light without loss of privacy. The channels can be installed vertically or horizontally and can be configured as straight, curved or serpentine walls. Intermediate vertical mullions are generally not required for vertical installations. The channels come in long-lengths: up to 23 feet.

In Building 115, the architects incorporated Lumira™ aerogel in the enclosed space between the channels to further enhance energy performance and reduce sound transmission.

“Pilkington Profilit helped tie the different elements of the building together; it adds character to a structure made of mostly steel and concrete,” adds Graham. “It lets in light, allows for privacy and is visually interesting day or night.”

For more information on Pilkington Profilit, along with TGP’s other specialty architectural glass and framing products, visit www.tgpamerica.com.

To learn more about the work of Graham Baba Architects, visit www.grahambaba.com.