1. ADVANTAGES OF CLEARSHADE GLAZING
   OPTIMIZED DAYLIGHTING: MORE LIGHT - BETTER LIGHT
   LESS HEAT: SOLAR HEAT CONTROL
   TRANSPARENCY + VIEWS / USER COMFORT
   PERFORMANCE ANALYSIS / CERTIFICATION
   DESIGN OPTIONS

2. HOW DOES CLEARSHADE WORK? TECHNOLOGY
3. APPLICATIONS
4. PRODUCT OPTIONS
5. KEY PROJECTS / CLIENTS

Panelite creates materials that provide an unparalleled combination of performance and aesthetics for architecture. We are the inventors of ClearShade™ technology and the leaders in high performance energy saving honeycomb glazing. ClearShade™ glazing units have been performing successfully in the field for over 10 years.
1. ADVANTAGES OF CLEARSHADE HONEYCOMB GLAZING

One product to address daylighting, solar heat control, and user comfort goals.

Panelite’s ClearShade high performance exterior glazing allows architects, engineers and building owners to meet daylighting, energy efficiency, user comfort and aesthetic goals in a single product. Most critical for energy efficiency and return on investment, ClearShade™ technology optimizes both DAYLIGHTING and SOLAR HEAT CONTROL, while most glazing solutions favor one of these goals at the expense of the other. The combined reduction of lighting and HVAC loads results in significant energy and cost savings. The complexity, maintenance and cost of add-ons such as light-shelves and shading devices are eliminated.

ClearShade’s angular selective technology rivals electro-chromic and thermo-chromic technologies in solar heat control performance, but offers better daylighting and views, and at a fraction of the cost.
OPTIMIZED DAYLIGHTING | MORE LIGHT - BETTER LIGHT

ClearShade™ redirects light rays to transmit up to 70% daylight and substantially diffuse glare, reducing the energy required for electrical lighting and improving user comfort.
For more: OPTIMIZED DAYLIGHTING

LESS HEAT: SOLAR HEAT CONTROL

While most building envelope solutions favor daylighting or solar heat control at the expense of the other, ClearShade addresses both, with a 75% improvement in solar heat gain control over standard IGUs, with Solar Heat Gain Coefficients as low as 0.07 at midday to reduce HVAC requirements and improve energy efficiency.
For more: SOLAR HEAT GAIN CONTROL

TRANSPARENCY + VIEWS / USER COMFORT

ClearShade™ can be specified to provide more or less visual transparency as required by the program or building orientation. The geometry and molecular makeup of the proprietary ClearShade insert diffuse daylight to reduce glare, further improving user experience, comfort and productivity.
For more: TRANSPARENCY + VIEWS
PERFORMANCE ANALYSIS / CERTIFICATION

Panelite ClearShade™ is the only high performance honeycomb glazing technology tested by Lawrence Berkeley National Laboratory (LBNL) and fully integrated with LBNL / US Department of Energy’s building envelope performance analysis software WINDOW 7. Contact a Panelite representative for design development assistance, project-specific energy analysis, including the option of custom BSDF files, or performance certifications.
For more: ENERGY MODELING

DESIGN OPTIONS

ClearShade glazing units can be completely tailored to the designer’s vision. The honeycomb insert is available in a range of architectural colors and patterns and can also be customized. The makeup of the insulating glass unit can be specified in a broad range of standard or custom colors, coatings, frits, and dimensions.

ClearShade™ technology optimizes DAYLIGHTING and SOLAR HEAT GAIN CONTROL in a single product:
- Increased diffuse light transmission = less electrical lighting = energy savings
- Reduced solar heat gain = less HVAC cooling = energy savings
- Optimized light diffusion, glare reduction, and views = user comfort and productivity
2. CLEARSHADE™ TECHNOLOGY

ClearShade™ honeycomb inserts consist of a high performance raw material manufactured into a network of cells using a patented production process.

- ClearShade™ polymer is a UV stabilized material engineered for spectral and thermal performance as well as IGU seal compatibility and durability.
- Honeycomb inserts are produced from this unique polymer in a patented co-extrusion and thermal fusion process to ensure a monolithic and adhesive-free insert with long term color, UV stability and technical performance.
- ClearShade™ is engineered to reflect more infrared wavelengths at higher sun angles, improving solar heat control while optimizing daylighting. Industry-leading Light to Solar Gain ratios improve energy efficiency, user comfort and productivity.

Panelite’s proprietary ClearShade™ technology is an “angular selective” technology that redirects light rays, providing high diffuse light transmission while reflecting direct solar rays, minimizing heat entering the building. This ray redirection technology provides three critical advantages:

MORE LIGHT. ClearShade™ provides up to 70% light transmission depending on the insert and glass types specified; few energy performance glazing solutions maintain such high levels of natural daylight while controlling solar heat. Energy required for lighting is greatly reduced. See the Parrish Art Museum Case Study, where ClearShade provides museum-quality daylighting with 89% energy savings.

 BETTER LIGHT. ClearShade diffuses light rays, eliminating glare and improving user comfort and productivity.
LESS HEAT. ClearShade reflects direct solar rays to reduce heat entering the building, especially at peak hours. Energy required for cooling is also greatly reduced.

WHAT IS ANGULAR SELECTIVE GLAZING?

ClearShade™ is an angular selective technology whose honeycomb structure performs like a series of very small louvers, but in cellular rather than linear form. This structure combined with a proprietary polymer composition provides the unique advantage of dynamic performance - increased solar heat protection at peak hours – without the dramatic reduction invisible light that occurs with other dynamic technologies such as switchable glass.

ANGULAR SELECTIVE GLAZING vs. LOW-E ONLY vs. DYNAMIC GLAZING

Angular selective glazings are designed to attenuate direct solar radiation, the main source of solar heat gains and glare, while transmitting a significant amount of diffuse skylight.

Glazings that use low-e coating to achieve solar heat control often do so at the expense of visible light, and this performance is static throughout the day, blocking daylight even when the sun is not at its peak. Dynamic glazings vary over the course of the day to reduce solar heat at peak hours. Technologies such as electro-chromic or thermochromic glass do this by darkening to nearly opaque, blocking both visible light and solar heat.

ClearShade’s angular selective technology rivals electrochromic and thermochromic technologies in solar heat control performance, but offers better daylighting, and at a fraction of the cost.
3. APPLICATIONS

- SKYLIGHT
- CURTAIN WALL
- CLERESTORY
- SPANDREL
- BACKLIT + FEATURE
- PARTITIONS

**EXTERIOR PROJECTS GALLERY**

Curtain Wall

HUBBARD LIBRARY  KANSAS CHILDREN'S DISCOVERY CENTER  HENRY MAIDEN LIBRARY AT CSUF  CORNELL ECOLOGY  FALCON PHARMACEUTICALS  CHAMPION LIBRARY

MCCORMICK IIT  SYRACUSE ARCHITECTURE  INV MANAGEMENT  VERTICAL SCREEN HQ  COMMONWEALTH MEDICAL COLLEGE  AMHAY CENTER
4. PRODUCT OPTIONS

ClearShade Insulating Glass Units can be tailored to meet both performance and aesthetic goals, by choosing from our extensive options for Unit Configuration, ClearShade Insert, and Glass Lite specifications. Panelite offers design development assistance including technical support, energy analysis and performance certifications.

PERFORMANCE OPTIONS

Daylighting requirements, Solar Heat Control, Insulating requirements, Energy-saving targets
Hurricane- or blast-resistance, Acoustic specifications, Views/privacy

AESTHETIC OPTIONS


For a complete list of product options visit PRODUCT OPTIONS.
5. PROJECTS / CLIENTS

“In replacing the original translucent textured and wired safety glass, Panelite solved all four major issues that needed to be addressed in the renovation of the Hutchinson Gymnasium (now the Tse Ping & Cheng Cheung Ling Sportscenter) at the University of Pennsylvania: natural light, visibility to the exterior, insulation and sun control while simulating the original historic appearance. If the original architect Charles Klauder had Panelite available to him in the 1920’s, we suspect he would have used it in the design of the original Hutchinson Gymnasium Building.”

- James Pastine, Crawford Architects

“Scranton is subject to a lot of cloudy sky conditions, and we wanted to maximize daylighting potential. The city grid is rotated 45 degrees from north, meaning high-gain facades facing southwest are challenging from a light control and [solar heat] gain perspective. ClearShade achieved multiple objectives; from the interior it is effective at scattering light high in the laboratories and academic areas while minimizing [solar heat] gain, and from the exterior it creates a diaphanous mass at night to define the building mass and elements such as the tower.”

- Thomas Knittel, AIA LEED AP | VP, Senior Principal, Design HOK

The vestibule is clad in Panelite ClearShade glazing, creating a bold color at the entry as well as visual interactivity and playful optical illusions for guests as they enter. The unique honeycomb pattern and light effects supported the design intention of creating a vibrant and colorful atmosphere.

- Carrie Mabee, Gould Evans

Selected projects and clients are listed below. For an extensive image gallery please visit our website: PROJECT GALLERY

KEY COMPLETED CLEARSHADE PROJECTS (click images to view)

(Left) Burnsville Performing Arts, MN, by Ankeny Kell Architects / (Center) Amway Center, FL by Populous / (Right) Kansas Children's Discovery Center, KS, by Gould Evans Architects
(Left and Center) Henry Madden Library at CSU Fresno, CA, by AC Martin Partners / (Right) McCormick Tribune Campus Center, IIT, IL, by Office for Metropolitan Architecture

(Left) Parrish Art Museum, NY, by Herzog & de Meuron Architects / (Center) jetBlue terminal 5 at JFK, NY, by Gensler / (Right) Greenpoint Emergency Medical Service Station, NY, by Michielli + Wyetzner Architects

(Left and Center) Marquis Condominiums, Miami FL, by Arquitectonica / (Right) Champaign library, IL, by Ross Barney Architects

(Left) The Commonwealth Medical College, Scranton PA, by HOK / (Center) Falcon Pharmaceuticals HQ, Mexico City, by Rojkind Arquitectos / (Right) Hutchinson Gymnasium, U Penn, PA, by Crawford Architects
CLEARSHADE PROJECTS UNDER CONSTRUCTION

Kuwait Ministry of Finance, Kuwait / CHS U sciences, PA, by L2 Partridge / Langone Medical Center, NY, by Ennead

CASE STUDIES demonstrate the benefits of ClearShade:

**Parrish Art Museum** by Herzog et de Meuron, Arup Engineering

CLICK IMAGES BELOW To Link to Case Study (top) / NYSRDA-LRC Field report (Bottom)

CLEARSHADE™ skylight glazing REDUCES ENERGY requirements by 89% while providing museum-quality **DAYLIGHTING** at Parrish Art Museum by Herzog & de Meuron (Field Study by NYSERDA + LRC)

ClearShade for energy-savings and museum-quality daylighting at **Parrish Art Museum** by Herzog & de Meuron (Field study by New York State Energy and Research Development Authority/ Lighting Research Center)
Additional Case Studies:

EDUCATION

• ClearShade for daylighting and solar control at The Commonwealth Medical College by HOK.

ATHLETIC FACILITIES

• ClearShade to provide daylighting, views, solar heat control while enhancing historic character in a retrofit application at the Tse Ping & Cheng Cheung Ling Sports Center at Hutchinson Gymnasium, University of Pennsylvania, by Crawford Architects.

LIBRARY

• ClearShade for daylighting and views at Fuller Theological Seminary by William McDonough & Associates.

CULTURAL

• ClearShade provides color and a playful quality of directional transparency, at Kansas Children's Center, KS, by Gould Evans Architects.