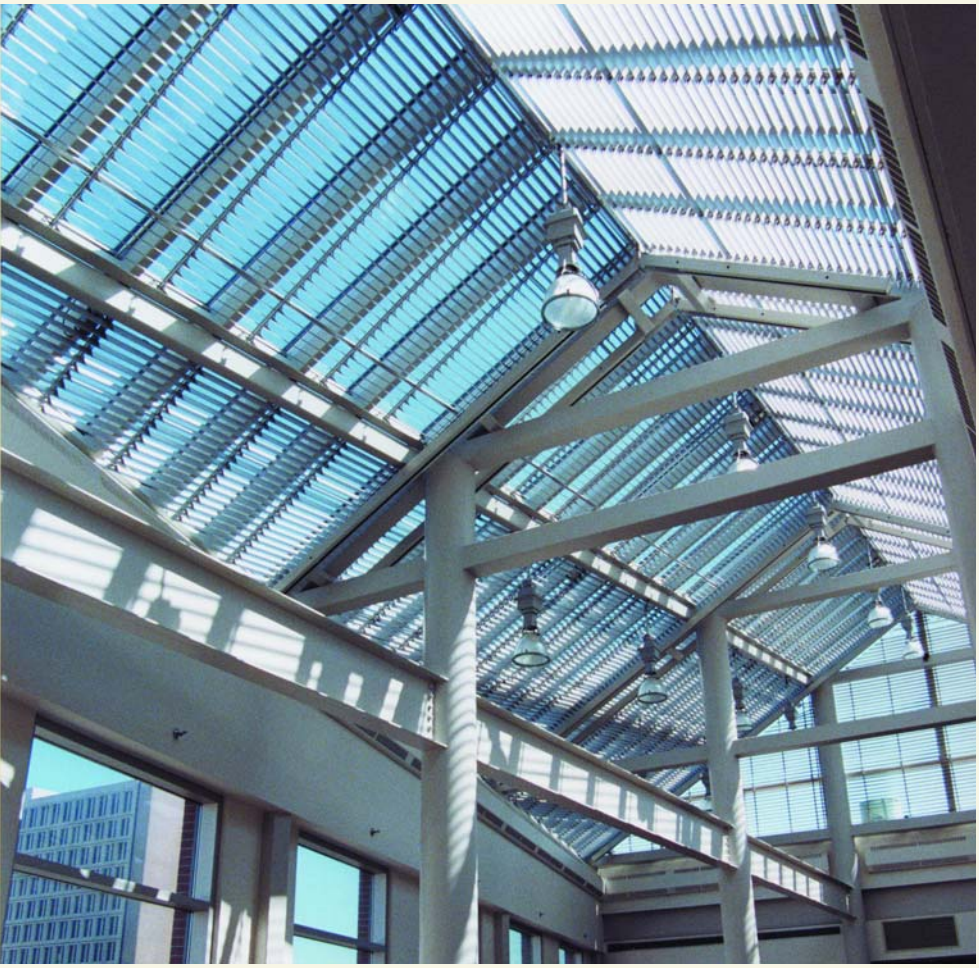
Sun Louvers

NYSAN
SOLAR CONTROL
A Hunter Douglas Contract Company

Service. Performance. Innovation.

As an integral part of the building envelope, Nysan solar control solutions manage light, heat and energy along the windowed wall. Solar control systems can enhance natural daylighting, reduce glare and regulate thermal gain to improve productivity and enhance indoor comfort.

Nysan solar control solutions give architects the tools to meet the demanding expectations of today's sustainable performance buildings. No other source offers the complete comprehensive solar control systems from manual and automated roller shades, to light shelves and exterior shading systems, to fully integrated sun tracking and custom solutions.



Left
Project: University of Calgary
Murray Fraiser Hall, Faculty of Law
Architect: Graham Edmunds Architecture
Dealer: RGO Office Products
Product: Skylight Louvers

Left
Project: British Junior School
Architect: Kraaijvanger-Urbis Architects
Product: Sun Louvers

Cover
Project: Biodesign Institute at ASU, Phase 2
Architect: Gould Evans and Lord, Aeck & Sargent Architecture
Dealer: HCI Resources
Product: Custom Wood Louver Systems

Effective Shading, Distinctive Design.

Sun louvers and other external shading systems not only deliver outstanding functionality, but also help a building surface create a distinctive look. Through shading the building façade they control the amount of solar gain thus reducing cooling loads while maintaining external vision and maximizing daylight entry.

Project: Private Residence, Los Angeles, CA
Dealer: AWS
Product: Aerofoils

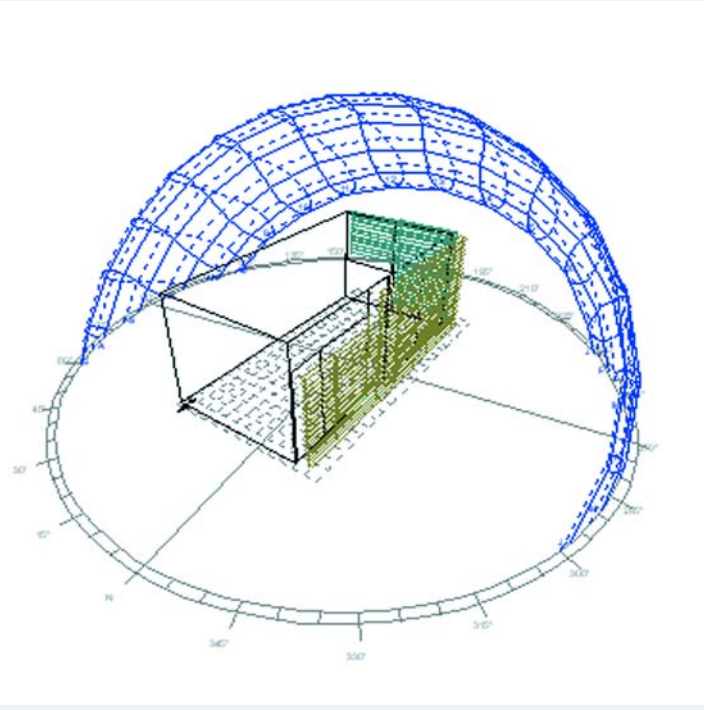
Nysan sun louvers and specialty external systems are available in a wide range of profiles and styles. With numerous design applications sun louvers offer a variety of solutions for solar control.

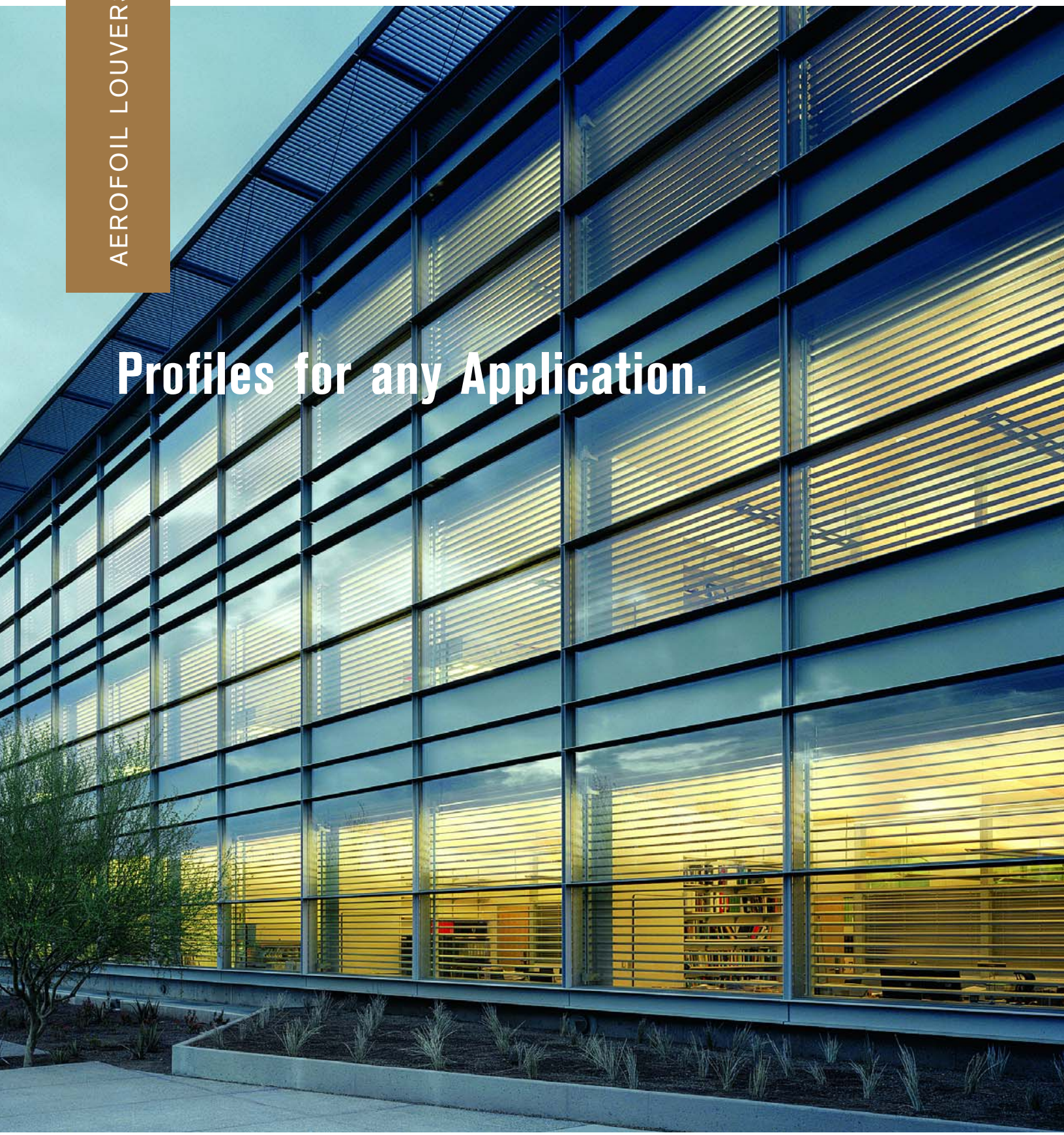
Generally speaking, larger louvers are more appropriate for effective external shading – the greater spacing between them makes them less obtrusive and allows better outward vision from inside the building. Additionally, larger louvers are more structurally robust and can achieve larger spans, requiring less support structure. Louvers are also structurally stronger (and will deflect less) if they are installed at an angle rather than horizontally.

The wide range of Nysan sun louver systems includes:

- Aerofoil “fin” louvers, mounted horizontally on high sun angle elevations while stacked vertically on low sun angle elevations
- Z and C louver panel systems, which are often projected vertically out from the head of the glazing
- Skylight louvers, which are operable rack arm systems, designed to allow very finite control of the attached louvers delivering the highest levels of light control. Perfect for irregular shaped skylights or for museums and galleries where very specific light levels are required
- Customized systems, including louvers in glass, wood, and metal; specialized finishes; advanced control and automation options; and more

SUN PATH DIAGRAM





Profiles for any Application.

Aerofoil (fin) louvers deflect thermal gain from incident sun, integrating light control into the building envelope. Well designed louver configurations can be as striking as they are effective, shading the façade against low or high sun angles while also making an aesthetic statement.

As with any system, design considerations such as louver size and composition affect performance:

- Single piece extruded Nysan aerofoil louvers from 4" (100mm) to 24" (600mm) tip to tip
- Extruded louvers are more durable, while fabricated designs can include perforation to modify their performance
- Louver shapes, composition, and finish also can be used to create specific daylighting effects as well as establishing a different aesthetic

Sun-louver systems incorporate three basic elements:

- Louvers to provide shading incorporating fin and end caps
- For operable louvers, an operating strip that adjusts louver orientation
- Brackets and frame that fix the system to the facade

Aerofoil Features:

- Fabricated Nysan louvers can be created at nearly any size
- Aerofoil composition is typically metal *(aluminum or steel)*, but many other options exist, including glass and wood *(see custom, page 13)*
- Nysan metal louvers typically have an anodized aluminum finish to ensure long product life and minimal maintenance. Other finishes include polyester powder coating and fluoropolymer painting. All resist damage due to sun or weather

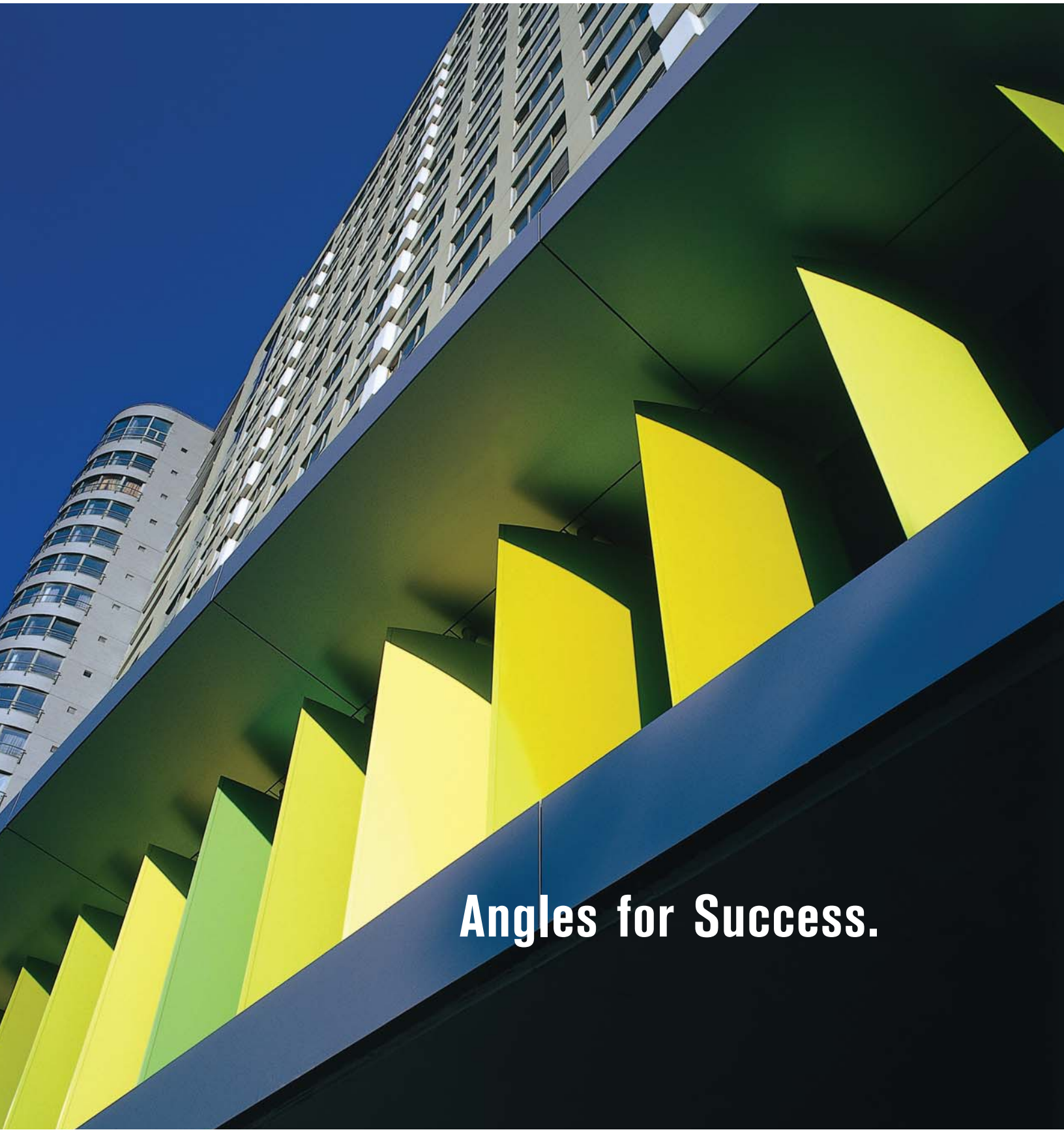
Left:
Project: Biodesign Institute at ASU, Phase 1, Tempe, AZ
Architect: Gould Evans and Lord, Aeck & Sargent Architecture
Dealer: HCI Resources
Product: Internal 5" Motorized Aerofoil Louvers

EXTRUDED SUN LOUVER:

Extruded sun louvers are single piece extrusions available in a wide range of shapes and profiles. The advantage to single piece extrusion is they are less susceptible to environmental damage caused by freeze/thaw cycles and maintain consistency and shape over large spans and show substantially less staining and streaking after years of exposure.

FABRICATED SUN LOUVER:

Fabricated sun louvers include any louver which is made up from a series of sections or pieces. Advantages of a fabricated louver are the ability to include perforations, different materials (glass, timber) and large or irregular shapes.



Angles for Success.

Project: Else Club Wellness Park
Architect: Architektenburo 4A and TPO
Product: Custom Louvers

The façade orientation in relation to the sun also determines the optimal configuration:

- Louvers are typically specified horizontally for south-facing elevations and can be positioned to provide optimal shading at a particular sun angle
- On eastern and western elevations, by contrast, louvers are configured vertically to provide shading at lower sun angles

Nysan Aerofoil System Features

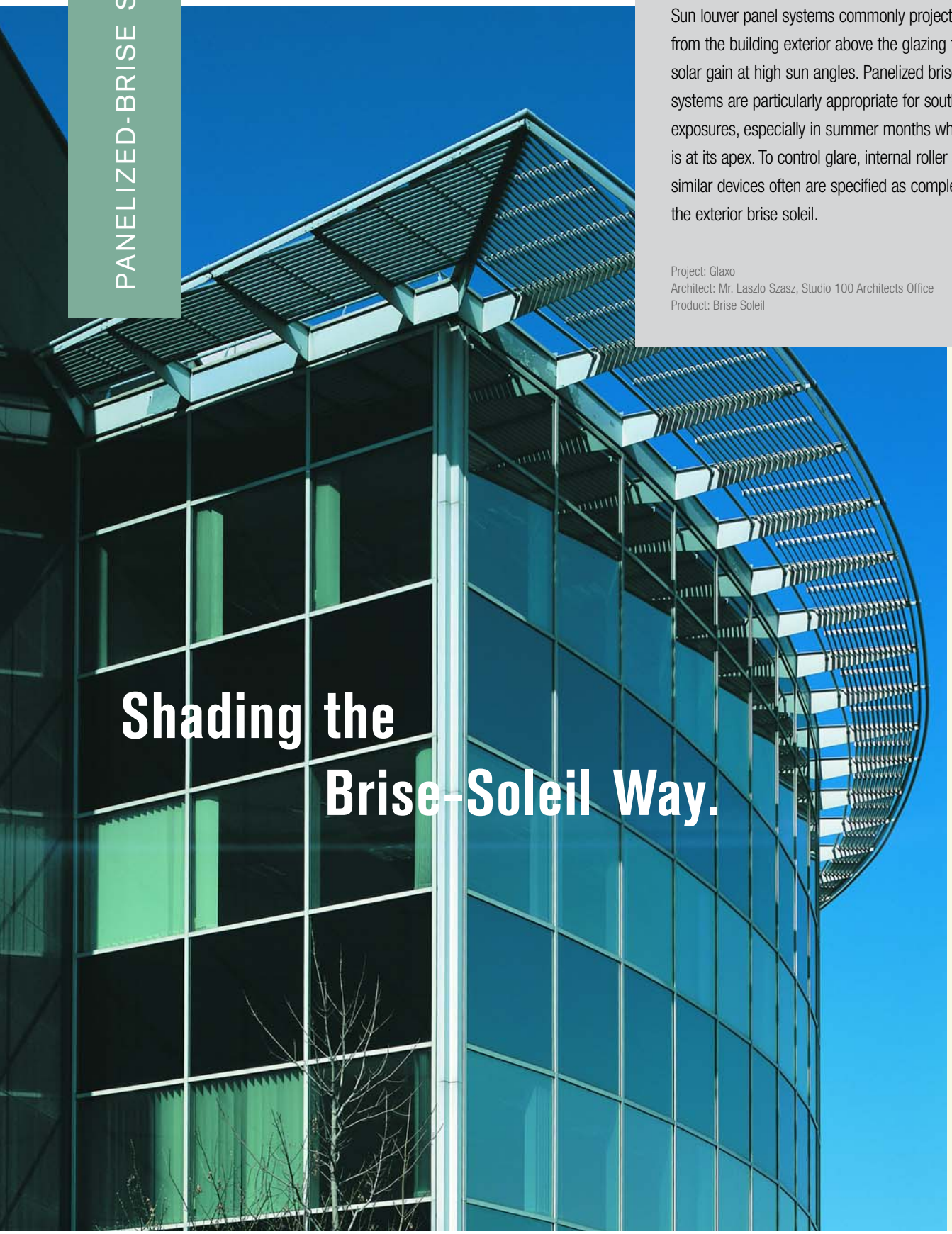
- Optional Nysan SolarWare™ software models the progression of sun angles to ensure optimal configuration and performance of the louver system
- Louvers can project horizontally out above the glazing when mounted in a panel (brise soleil) configuration (see next page)
- Nysan louver and mounting systems are engineered to withstand loads from wind and snow/ice, and can be designed for easy removal when necessary

BUILDING ORIENTATION:

Building Orientation refers to the physical facades of the building in orientation to proper compass points (N, E, S, W).

SUN ANGLE:

The position of the sun is determined from two angles – the altitude angle and the azimuth angle. The altitude angle indicates the height of the sun in the sky; the azimuth angle indicates how far the sun is from due north/south.



Shading the Brise-Soleil Way.

Sun louver panel systems commonly project horizontally from the building exterior above the glazing to block solar gain at high sun angles. Panelized brise soleil systems are particularly appropriate for south-facing exposures, especially in summer months when the sun is at its apex. To control glare, internal roller shades or similar devices often are specified as complements to the exterior brise soleil.

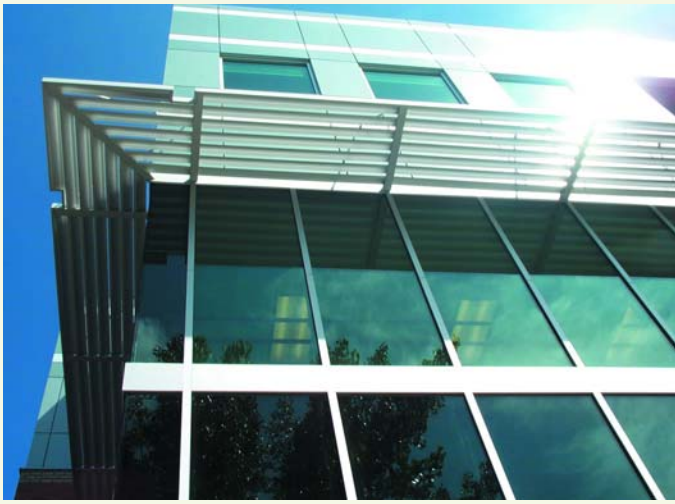
Project: Glaxo
Architect: Mr. Laszlo Szasz, Studio 100 Architects Office
Product: Brise Soleil

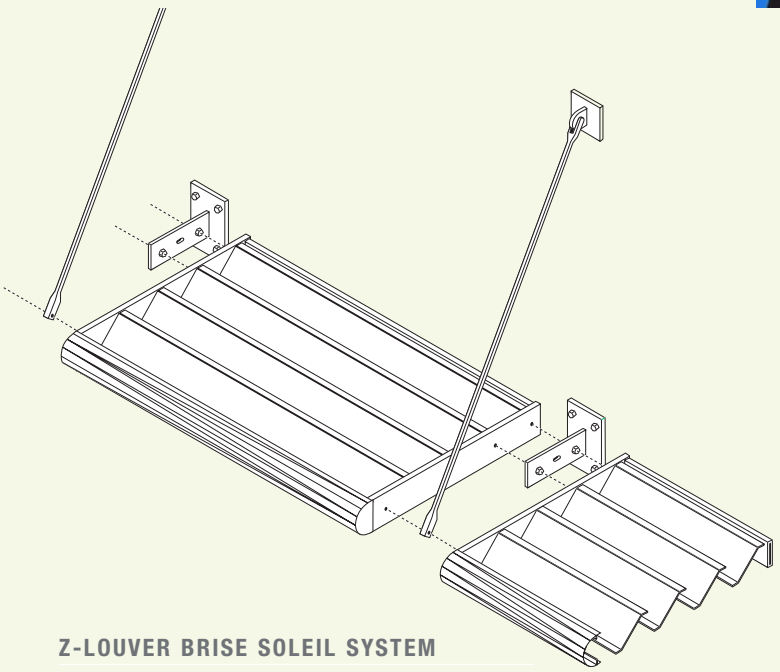
As panelized brise soleil systems are added at the head of the glazing they allow unrestricted views and can be combined with internal light shelves, roller shades, or other shading devices to provide maximum control of solar gain, glare and natural daylight.

Panelized brise soleil systems comprise a system of louvers mounted in a frame. The frames are often pre-assembled, then affixed at regular intervals to the building exterior. Nysan panelized brise soleil systems feature:

- Versatile design that can accommodate a wide range of louver profiles, including "C" and "Z" profiles
- Adaptable carrier systems for any building type, curtain wall, store front, or façade systems
- Sturdy designs engineered to withstand wind and snow/ice loads, and can be engineered to carry additional weight, for example to ease cleaning and maintenance of the glazing and exterior
- Integrating with the design our staff will engineer access ways for window wall cleaning gondolas, swing stages, or boson chairs

Project: Medicine Hat College
Architect: Baird & Bergum Architects Ltd
Dealer: RGO Office Products
Product: Brise Soleil





Z-LOUVER BRISE SOLEIL SYSTEM

CARRIER SYSTEM:

A framed system with discrete louver panels which are installed above individual windows. In cases where the wind and/or snow loads are very significant, it is possible to use diagonal brace arms in addition to the main fixing brackets to ensure that the required projection can be achieved and/or the loads can be supported by the structure. This is often the case when the system is being fixed to a window wall.

Making Skylights Easy.

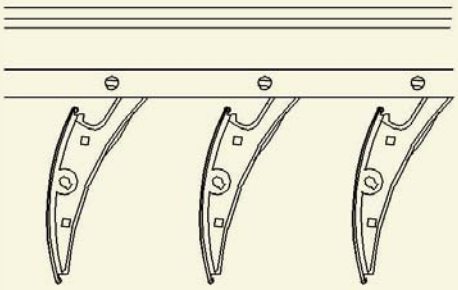
Solar control solutions for skylights can pose a number of challenges, including:

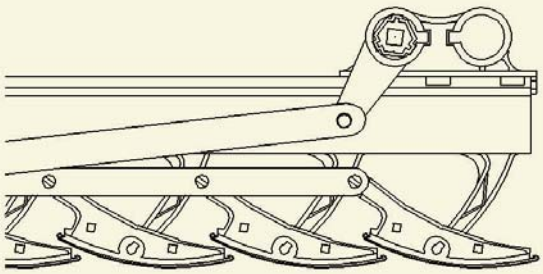
- **Unusual glazing surfaces –** Nysan skylight louver systems are ideal for angled, pitched or irregular shapes such as trapezoids and circles
- **Precise light control –** Museums and galleries often require very specific light control, Nysan skylight louvers allow 110 degrees of rotational control from blackout to fully open
- **Reliability –** Skylights often allow limited accessibility and require solutions which are very reliable and require little need for maintenance or repair. Skylight Louvers are all backed by Nysan's Hassle Free™ Warranty and are designed to operate long term with no maintenance

Nysan Skylight Louvers offer a number of features ideal for skylights and specialty glazing applications requiring precise light control.

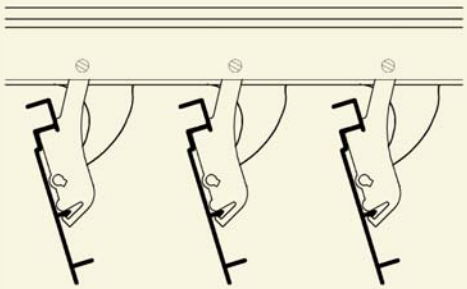
- The Nysan Skylight Louver system is flexible in application and can be used both internally and externally on all orientations, angles and glazing shapes
- The system is available with a variety of different slats, including flexible, rolled-edge, and extruded aluminum slats, as well as wooden slats
- Available interlocking louvers with brushes, along with perimeter baffles, provide nearly total blackout, with adjustability to allow daylighting as needed
- Full motorization and advanced control options available including the Nysan SolarWare™ sun tracking control system

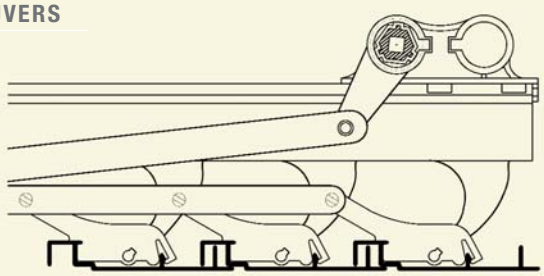
3" (75MM) LOUVER SYSTEM





3.5" (88MM) BLACKOUT INTERLOCKING LOUVERS





Creating Custom Louver Solutions.

Modern solar control systems need to be designed to meet the demanding expectations of today's sustainable architecture. The need to integrate systems into the building envelope requires the production of specifically engineered and custom solutions. By changing the characteristics of the materials and creating new profiles and custom shades, Nysan is able to produce systems to meet the building's aesthetic and performance requirements.

Nysan has designed many wood louver systems for a wide range of applications. Each design is created to fit that project's specific set of requirements. Systems typically will include:

- A wide and diverse selection of louver profiles and sizes, each designed specifically for the project
- Length limits for each louver vary by material, but generally are constrained by the need to prevent deflection and twisting of the louver
- A variety of customizable frame and mounting systems, with fixed, operable and automated options
- Louvers can be comprised of Western Red Cedar, Iroko, or other sustainable hardwoods, with a natural patina finish that changes organically over time. Composite constructions of metal and wood laminates can also deliver a durable and attractive result

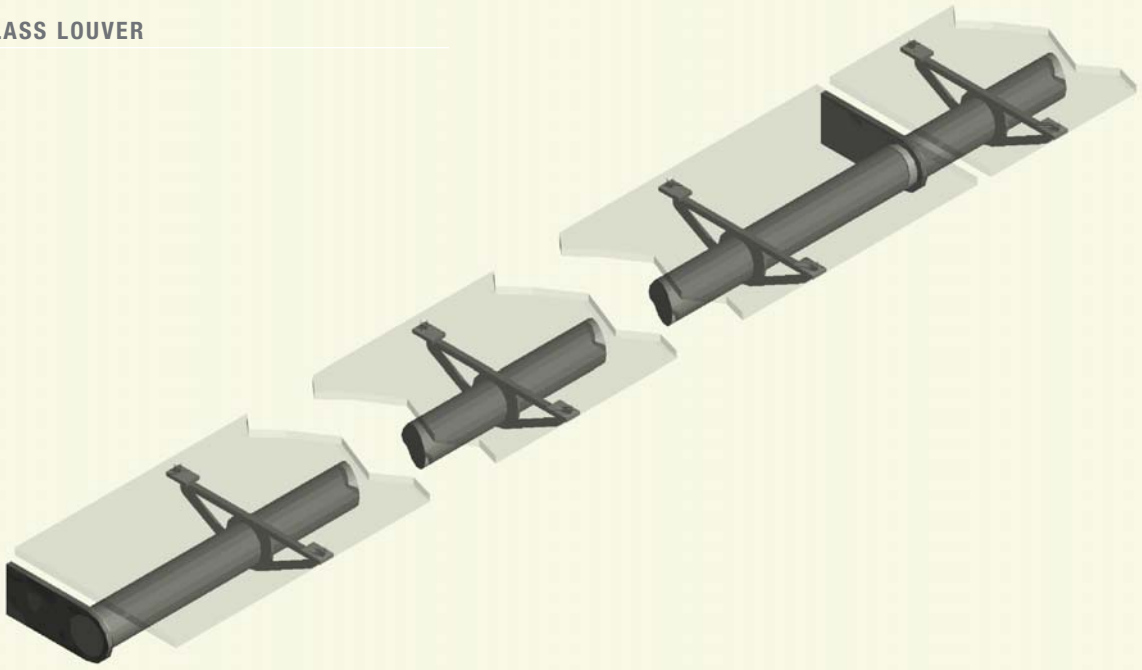
Project: Biodesign Institute At ASU, Phase 2
Architect: Gould Evans and Lord, Aeck & Sargent Architecture
Dealer: HCI Resources
Product: Custom Wood Louver System

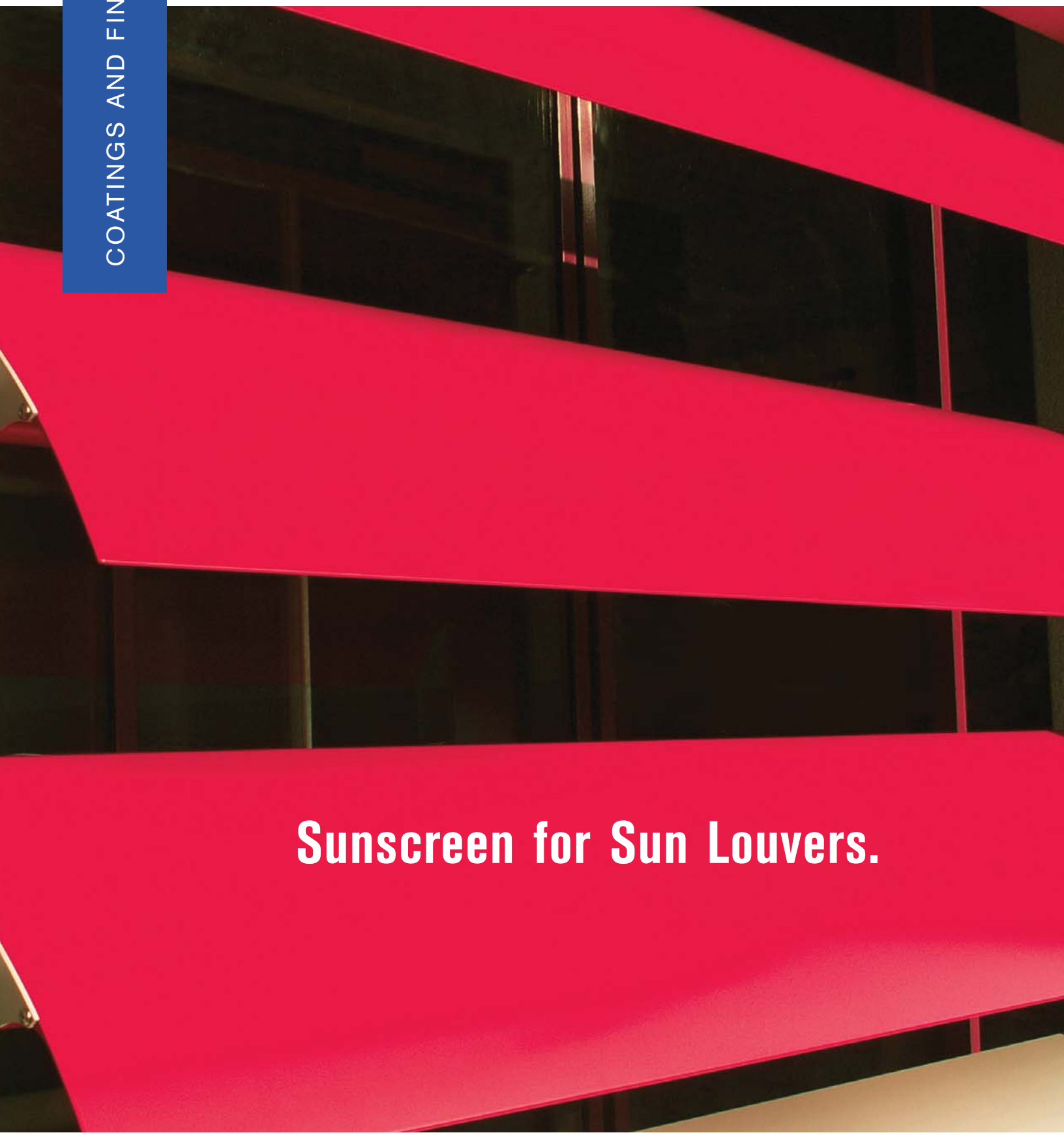
Project: Fire Station, Vught Netherlands
Architect: Breuker, Tilburg
Product: Adjustable Glass Fins

Nysan glass louvers generally are designed to fit the requirements of a specific project with a custom size and finish. Systems typically feature:

- Louvers comprised of laminated tempered glass and polished edges
- A wide range of surface designs to create varying opacity levels, using either ceramic or sandblasted frits
- Highly customizable color and finish treatments, according to the aesthetic and performance specifications
- Louvers up to 8 feet in length using Nysan's tubular support system
- For more information on specialty and custom solutions, please visit www.nysan.com

GLASS LOUVER





Sunscreen for Sun Louvers.

The engineering and quality of Nysan solutions goes far more than skin deep, but that doesn't make our finishes any less important.

Nysan sun louvers are offered in a wide variety of fluoropolymer painted coatings, in a nearly unlimited range of customizable polyester powder coated (PPC) designs, as well as in anodized aluminum. See the chart below for a comparison.

Each of these finishes not only protects underlying louver materials from the environmental stresses of sun, temperature, and weather, but also contributes significantly to the louvers' appearance and performance.

Finish	Benefits	Drawbacks
Anodized Aluminum Benefits	• Weather/UV resistant • Uniform coating which will not peel or chalk • Scratch resistant coating • Easier to recycle	• Fewer color choices
Fluoropolymer Paint	• Chemically inert resin is extremely durable • Very good UV resistance • Many color choices; can be metallicized with aluminum/mica flakes	• Solvent evaporation emits VOC's
Polyester Powder Coating	• Unlimited range of customizable designs • Emit low/no VOC's • Low energy, lower waste coating process • New PPC finishes such as Interpon D2000 are highly durable and colorfast • New PPC finishes have mechanical and UV properties equivalent to fluoropolymer paints	• Older PPC finishes did not retain color well • Older PPC finishes provided weaker UV protection

ANODIZING:

Converting the surface of an aluminum component to aluminum oxide.

FLUOROPOLYMER PAINTING:

Liquid paints composed of polyvinylidene fluoride (PVDF) resin and color pigment are mixed with a solvent and applied to the object. The solvent evaporates to leave a dry surface coating.

POLYESTER POWDER COATING:

Finish is applied as a powder and baked with a hardening agent to bond with the object.

Improving IEQ to Boost Productivity

Studies show that a typical large company can achieve productivity gains of $10 million or more annually by creating an environment that boosts productivity by just 5%. That's about 15 minutes more work from each employee per day.

Productivity gains are the payoff for investing in internal environmental quality. When the comfort and well-being of employees improves, productivity rises.

A well-designed solar-control solution will significantly enhance the comfort and well being of a building's occupants. By managing natural light, thermal gain, and glare, Nysan systems improve indoor environmental quality.

The diagrams opposite illustrate how well-designed schemes for solar control improve indoor environmental quality (IEQ) by:

- Admitting ample light and exterior views
- Enhancing daylighting schemes
- Reducing glare on computer screens and other reflective surfaces
- Managing thermal gain from incident solar energy
- Giving occupants independent control of the light, air, and temperature in a space

INTERNAL ENVIRONMENTAL QUALITY:

A standard for evaluating the comfort and well being of the occupants of a space. Incorporates factors such as light and glare, temperature regulation, acoustics, and air quality.

INTERNAL SYSTEMS OPTIMIZE NATURAL LIGHTING

Providing excellent contact with the outdoors, windows also admit plenty of daylight. Light shelves, daylight blinds, and other systems reflect natural light deeper into the space, spreading the benefits among more people and reducing dependence on artificial lights.

WINDOW SHADES AND BLINDS REDUCE GLARE

Internal shading systems such as roller shades and horizontal blinds allow people to control how much daylight falls on their workspace, allowing them to eliminate glare and annoying reflections on computer screens, for example.

EXTERNAL SYSTEMS REGULATE HEAT

By controlling incident solar energy before it enters the building envelope, external louvered blinds, brise soleil, and sun louvers regulate the temperature to reduce the need for air conditioning.

LOW-EMITTING MATERIALS MAINTAIN AIR QUALITY

Careful selection of low-emitting materials – textiles and other materials free of PVC and halogen, for example – in order to minimize the presence of air contaminants such as harmful or irritating dust and odors.

Holistic Approach

Nysan Solar Control products and systems are designed to improve indoor environmental quality and conserve energy. These systems help create built environments that are comfortable, healthy, productive, and sustainable. Our engineering and production processes minimize embodied environmental impact while meeting the highest standards for commercial, hospitality, industrial, institutional, and commercial applications.

Sustainable products include:

- **GreenScreen PVC-free fabrics** for roller shades that are best in class for quality, performance, and design choices
- **External louvered blinds, brise soleil, and sun louvers –** the most effective shading systems available. Proven to deflect three times more thermal gain than traditional window coverings
- **Advanced controls –** including sun-tracking and intelligent, context-based solutions – that integrate fully with building management systems to optimize performance
- The industry's widest range of custom and design-built solutions to express the latest developments in green architecture

RECENT GREEN PROJECTS

Our engineers have worked on numerous green and sustainably designed projects, from manufacturing facilities to high-rise office towers. Some recent examples appear below:

Wind NRG, Hinesburg, VT (Gold LEED)

One Bryant Park, New York, NY (Platinum LEED)

Alley 24, Seattle, WA (Gold LEED)

Schlumberger, Houston, TX (LEED CI)

Electronic Arts, Vancouver, BC (Gold LEED)

California Academy of Sciences, San Francisco, CA (Platinum LEED)

Art Institute of Chicago, Chicago, IL (Silver LEED)

SmithCarter, Winnipeg, MB (Silver LEED)

University of Toronto Center for Biosciences Technology and Design

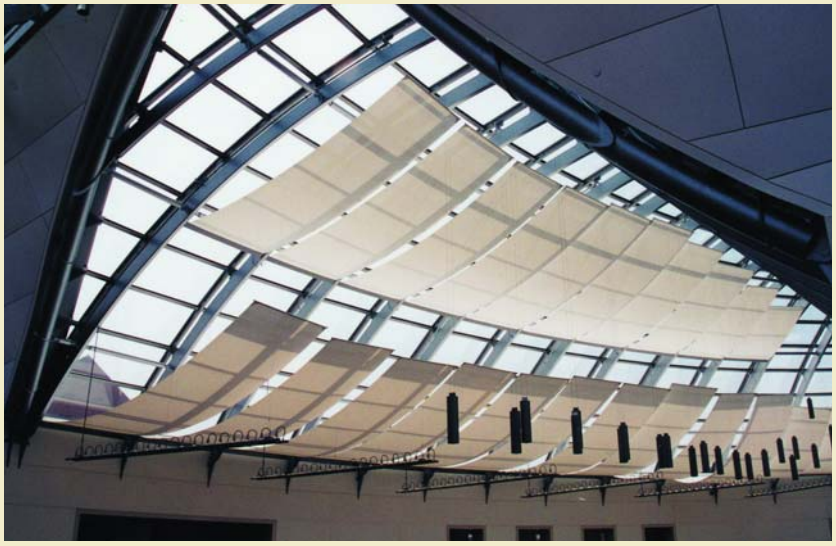
University of Michigan Bio Science Research Building

30 Hickson Road, The Bond

Alberta Children's Hospital, Calgary, AB

Below: Alley 24, Seattle, WA
Architect: NBBJ
Dealer: Pacific Shades
Product: External Louvered Blinds

Below: Peabody Essex Maritime Museum, Salem, MA
Architect: Moshe Safdie and Associates
Dealer: Baystate
Product: Sail Shades



SELECTED PROJECTS

Skirball Cultural Center, Los Angeles, CA
Architect: Moshe Safdie

Museum of Modern Art, New York, NY
Architect: Yoshio Tanaguchi and KPF

Financial Trading Center, Charlotte, NC
Architect: Skidmore Owings & Merrill LLP (SOM)

Vancouver Public Library, Vancouver, BC
Architect: Moshe Safdie; Downs/Archambault Part.

World Trade Center, Seattle, WA

Fluor Headquarters, Calgary, AL
Architect: Riddel Kurczaba

Wind NRG Partners, LLC, Hinesburg, VT
Architect: William Maclay Architects & Planners

MIT Stata Center, Cambridge, MA
Architect: Frank Gehry

Muhammad Ali Center, Louisville, KY
Architect: Beyer Blinder Belle

University of Michigan Bio Science Research Building,
Ann Arbor, MI
Architect: Polshek Partnership

Nelson Atkins Museum of Art, Kansas City, MO
Architect: Steven Holl

Lambeau Stadium, Green Bay, WI

Citi National Plaza, Los Angeles, CA

California Academy of Sciences, San Francisco, CA
Architect: Renzo Piano Building Workshop

Art Institute of Chicago, Chicago, IL
Architect: Renzo Piano Building Workshop

Below: Museum of Modern Art, New York, NY
Architect: Yoshio Tanaguchi and KPF
Dealer: LVC Interiors
Product: Skylight Shades and Sun Shades

Below: Biodesign Institute at ASU, Tempe, AZ
Architect: Gould Evans and Lord, Aeck & Sargent Architecture
Dealer: HCI Resources
Product: Custom Wood Louver System

Learn More

For the last 80 years, we've been fortunate enough to help turn countless innovative sketches into innovative buildings. Architects and designers from around the world have taken advantage of Hunter Douglas' unmatched project development, service and support. Chances are, you've seen more of Hunter Douglas than you think. Just look around. With major operation centers in North America, Europe, Latin America, Asia and Australia, we've contributed to thousands of high-profile installations, from retail and commercial facilities to major transit centers and government buildings. Not only are the world's architects and designers our partners, they're our inspiration. As they continue to raise the bar for excellence, we're creating projects to bring their visions to life.

- Call 800.727.8953, option 3 to speak with a specialist
- Visit www.nysan.com

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