

DYNAMIC GLASS

Product Guide

view

see possibility





View Dynamic Glass creates a world of opportunity

Windows have been central to building design for centuries. At their best, they deliver light and connect people to the world outside. But they also come with unwanted extras, glare and heat. Conventional solutions to these problems—blinds, external shades and massive air conditioning systems—complicate building design and limit the greatest value a window has to offer, the view. We have built a solution that eliminates these obstacles and creates an entirely new set of design possibilities.

With built-in intelligence, View Dynamic Glass automatically transitions between clear and variable tint, providing control over the amount of light and heat entering a building. In all conditions, View Dynamic Glass remains transparent, keeping you connected to the outside world. It's a simple idea. But one that will revolutionize the way buildings are designed and the way people interact with the built environment.

View's method is the first to leverage expertise in the semiconductor, thin-film solar and flat panel display industries and marry it with the best in glass processing.

Benefits

A new level of
design freedom
for a revolutionary
experience.



A BETTER VIEW

A stunning view blocked by blinds or marred by glare is not really a view at all. View Dynamic Glass allows you to look at—and be inspired by your view 24 hours a day.

NATURAL LIGHT

The value of natural light to the human condition is well documented. With View's intelligent design you can optimize the amount of daylight entering a building 365 days a year.

OCCUPANT COMFORT

Everyone wants to sit next to a window—until it gets too hot or so bright you can't see. View's intelligent design manages this automatically, keeping inside conditions comfortable even when things outside are not.

INTELLIGENT CONTROL

View Dynamic Glass incorporates intelligent controls that automatically adjust the condition of the window for optimal daylighting, energy savings, or visual and thermal comfort. Manual adjustments can be made through a wall switch unit, web interface, or mobile application.

FREEDOM OF DESIGN

Designers and architects rejoice. With View Dynamic Glass, you no longer have to choose between expansive glass facades and increased HVAC and shading complexity. You are free to create innovative designs that maximize your vision while improving energy efficiency.

ENERGY EFFICIENCY

Heating, cooling, and lighting are substantial costs in a building. View Dynamic Glass is an energy-efficient product that drives down HVAC and lighting costs. Cooling peak load and energy consumption are significantly reduced, allowing downsizing of HVAC systems and cost savings in annual operating costs. Architects and owners can realize a major contribution to LEED certification with the use of View Dynamic Glass.



Applications



SKYLIGHTS AND ATRIA

Skylights and atria are key architectural features of many buildings. These spaces typically have generous glazing that provide an infusion of natural light, but also heat and glare. They also commonly require expensive shading solutions and large, dedicated HVAC systems. View Dynamic Glass allows use of the space as it was intended. Always transparent, it adapts the tint level to maximize daylight and comfort of the space.

WORKPLACES

View Dynamic Glass enhances the desirability and value of any office. Occupants now benefit from management of heat, light and glare—all while maintaining the views that support innovative and productive work spaces.

HOSPITALITY

Beauty and comfort are essential elements of any hospitality setting. Expansive windows admit natural light and provide inspiring views from a lobby, restaurant, or guest room. View Dynamic Glass offers the design freedom to create spaces that enhance guest experience and eliminate excess heat and glare.

HEALTHCARE

Natural daylight and views help speed patient recovery and promote a more productive environment for healthcare professionals. View Dynamic Glass supports a healthy environment with abundant natural sunlight and views that connect people to the outdoors.

EDUCATION

Students learn and teachers instruct best in spaces that promote an alert, positive state of mind. View Dynamic Glass maximizes natural light and helps create a comfortable, learning-friendly environment.



How View Dynamic Glass Works

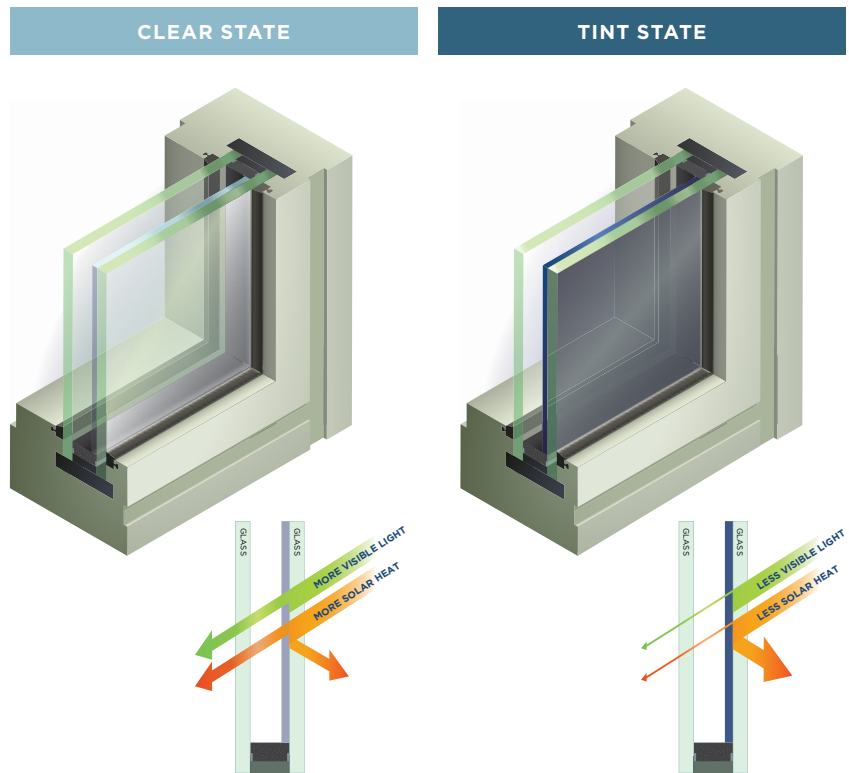
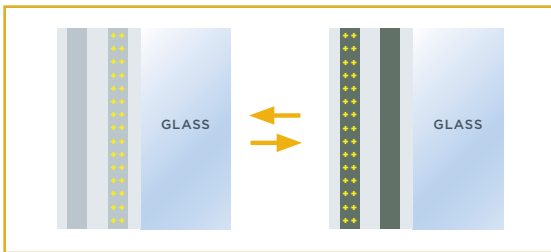
Proprietary Technology

A new generation of proprietary electrochromic technology:

- Enhanced window performance
- Sizes up to 5 x 10 ft. without obstruction (no center busbar or perimeter light leaks)
- Long term durability
- Greater intelligence and control
- Lower overall cost

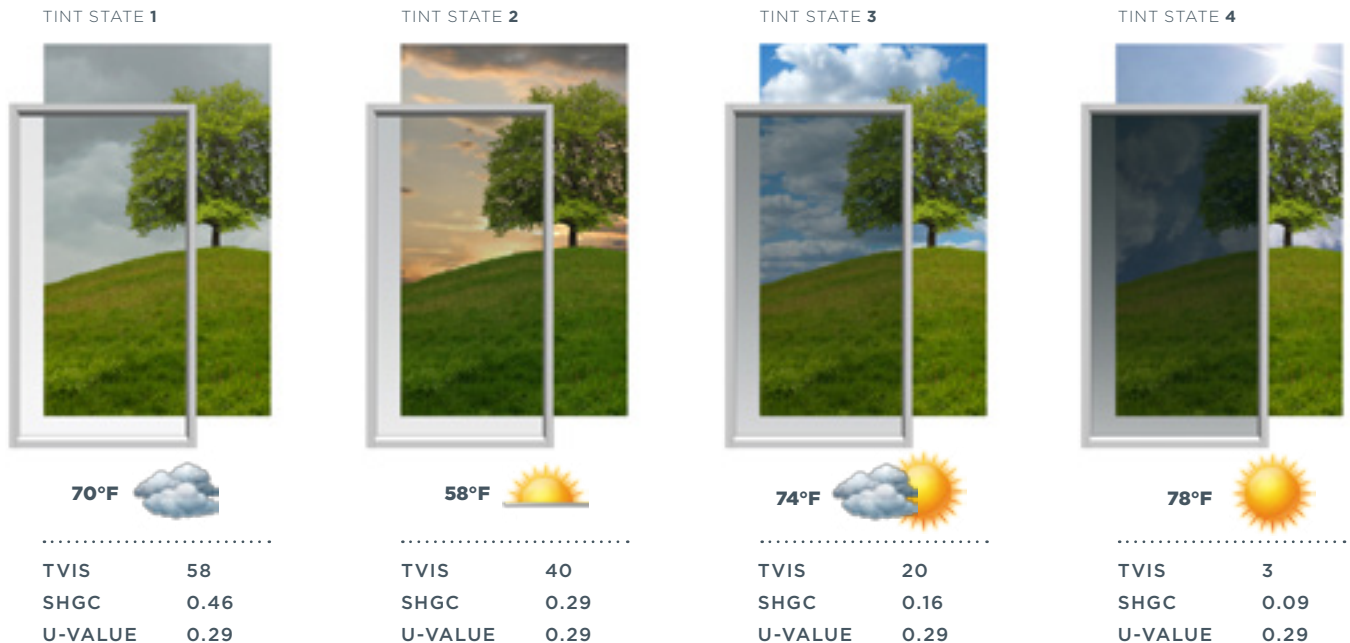
Tints Electronically

View's electrochromic coating consists of nano-scale layers of metal oxides. A small electrical voltage moves ions between the layers to change states.



Transitions Automatically

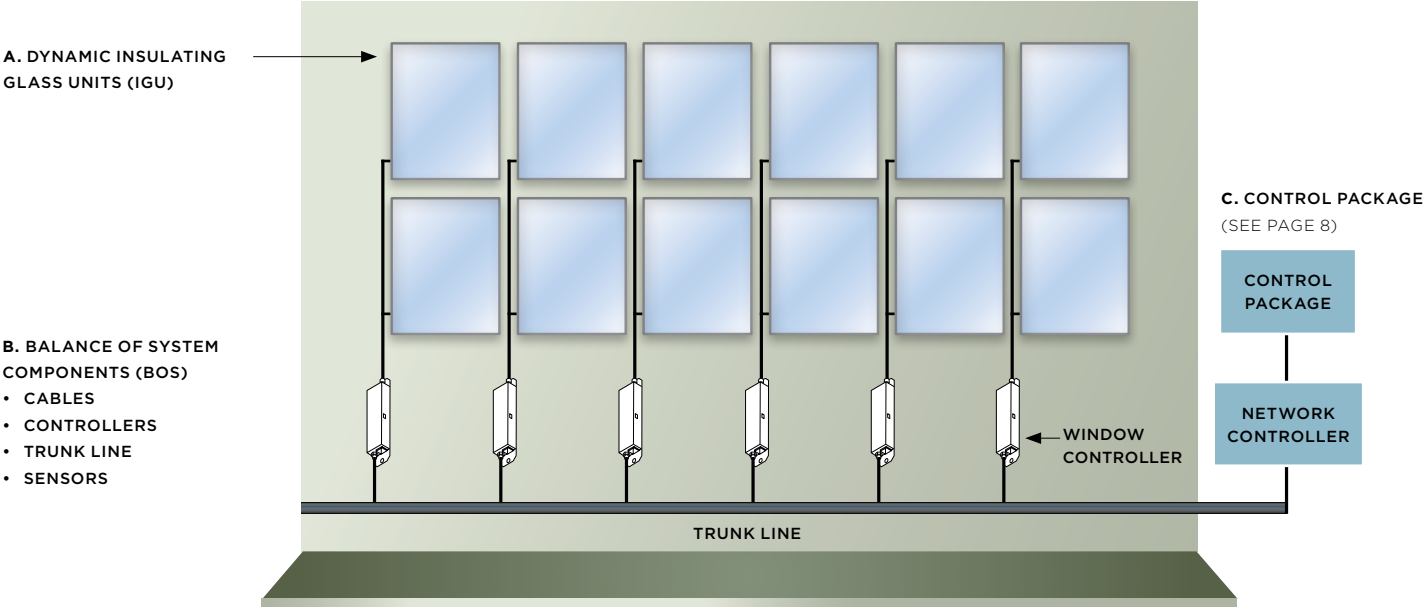
View Dynamic Glass seamlessly transitions through 4 variable tint states to provide continuous unobstructed views without heat or glare. It can automatically adapt to changing external conditions or be controlled by a user to meet specific preferences.



Intelligent Controls

Dynamic Glass, Dynamic Controls

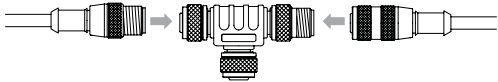
The View Dynamic Glass system is comprised of 3 core elements **A.** the Dynamic Glass IGU **B.** the Balance of System (BOS) components and **C.** the Control Package.



Easy to Install

View Dynamic Glass simplifies installation, reducing complexity, time and cost.

- Linear control network taps into a single trunk line eliminating the need to use individual cables for each window
- Low-voltage control network
- Pre-terminated cables and components



PRE-TERMINATED CABLES

Cutomized Systems

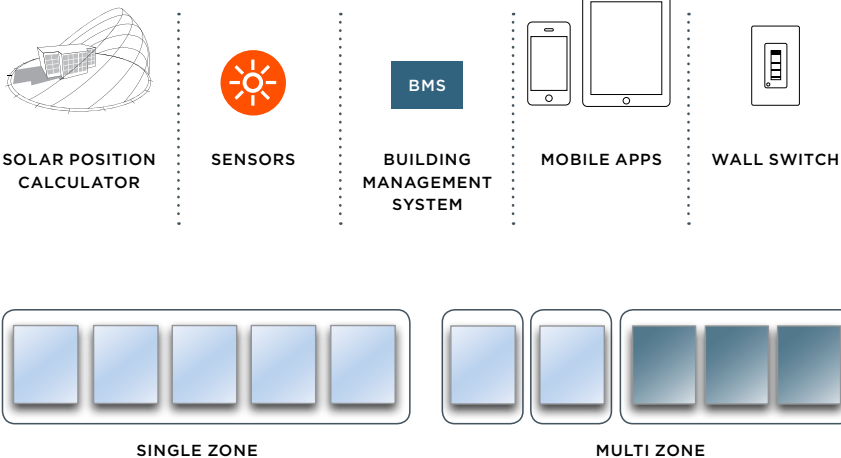
Easily configurable, and controllable to meet user applications.

FLEXIBLE

- From manual only to fully automated control
- Integrate with building management system (BMS)
- Multiple user interfaces: wall switch, mobile app, and web interface

CONFIGURABLE

- Programmable at any time
- Single or multi zoning



Control Package

Multi Zone Use

View Dynamic Glass offers control packages tailored to your specific application requirements.

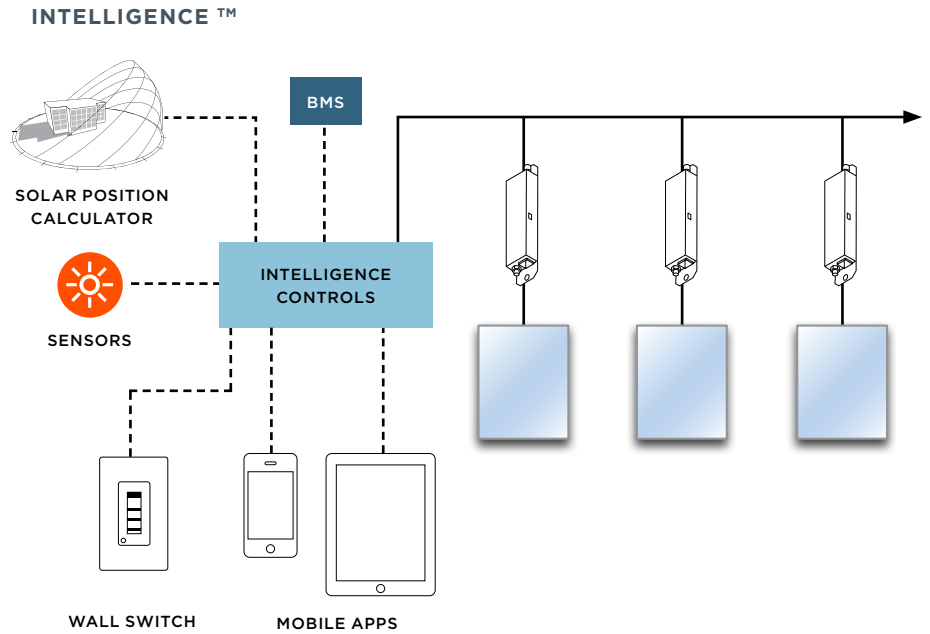
- Fully-automated control
- Predictive response with solar position tracking
- Detects environmental conditions with sensors
- Integration with BMS (Building Management System) *optional*

User Interface

Mobile app (iOS)

Web browser

Wall switches *optional*



Guaranteed Performance Specifications

IGU PERFORMANCE TABLE

TINT LEVEL	TRANSMITTANCE (%)			REFLECTANCE (%)			U-VALUE (BTU/HR. FT ² F)	SOLAR HEAT GAIN COEFFICIENT
	VISIBLE	UV	SOLAR	VISIBLE OUT	VISIBLE IN	SOLAR OUT		
TINT 1	58	3	37	18	20	18	0.29	0.46
TINT 2	40	2	21	12	19	12	0.29	0.29
TINT 3	20	1	8	8	17	11	0.29	0.16
TINT 4	3	0	1	7	17	11	0.29	0.09

Performance values apply to a 1" (25mm) IGU with two ¼" (6mm) lites and ½" (12.7mm) argon airspace; EC coating on surface #2.
All performance values are calculated by LBNL WINDOW 6.3 software and IGDB v24.

VIEW GLASS OPTIONS Standard makeup in **bold**

TYPE	Dual Pane Triple Pane	
SHAPE	Squares, rectangles Right-angled trapezoids and triangles	
DIMENSIONS	Maximum 60" x 120" (1,524mm x 3,048mm) Minimum 14" x 14" (356mm x 356mm) Maximum overall thickness 2" (52mm) All angles must be ≥30° with at least one 90° angle	
OUTBOARD LITE	THICKNESS STRENGTH COLOR COATING	6mm Fully tempered Clear Dynamic coating on #2 surface
INBOARD/CENTER LITE	THICKNESS STRENGTH COLOR COATING LAMINATED	3mm, 4mm, 5mm, 6mm Tempered , Heat strengthened Clear , SolarBlue, CrystalGray None / SN68, Cardinal i89 .015" / .03" / .06" / .09" PVB .015" and .030" interlayer thicknesses not available for any 3mm ply lami configurations.
SPACER MATERIALS AND THICKNESS	Foam Super Spacer® T-Spacer™ (black) ⅝", ½", 7/16", 3/8" (15.9, 12.7 , 11.1, 9.5mm) Contact for other thickness	
GAS FILL	>90% Argon, <10% Air 100% Air*	
SEAL	PRIMARY SECONDARY	PIB Silicone Polyurethane

- * For installations 2,500ft above sea level or higher, units will be built with capillary tubes.
- View Dynamic Glass transitions from the long edges of the glass inward to the center.
- Transition speed varies by the size of glass.
- Any View IGU with a base dimension > 84" will exhibit vertical roll wave distortion rather than industry standard horizontal roll wave distortion.
- Using a spark-type analyzer to measure gas content within the IGU will damage the electrochromic coating and void the warranty.

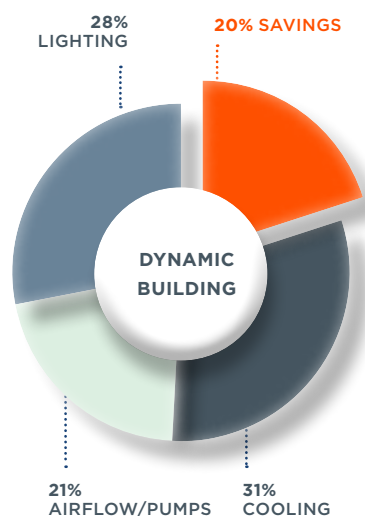
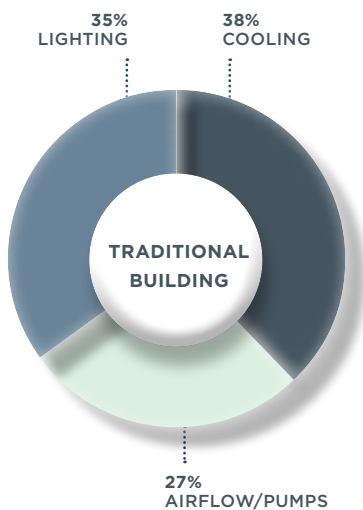
Dramatic Energy Savings for Workplace



Compare High-Rise Workplace

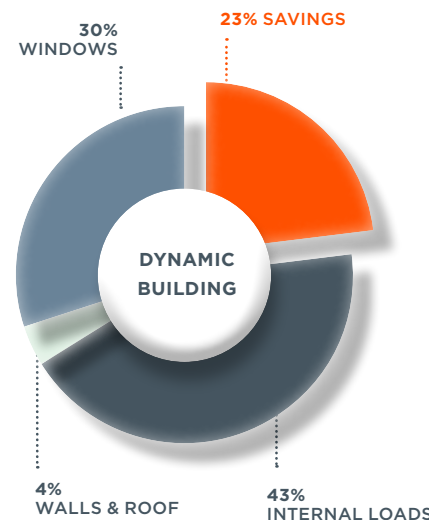
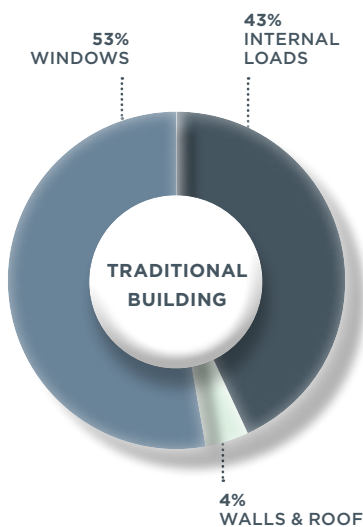
- 20 stories, 400K sf
- 50% window to wall
- Unitized curtain wall
- Central plant VAV
- Traditional: Low-e glass with laminated inboard lite
- Dimmable light
- Manual shades on traditional building

ENERGY USE



20% ENERGY SAVINGS IN HVAC AND LIGHTING ELECTRICITY

PEAK LOAD



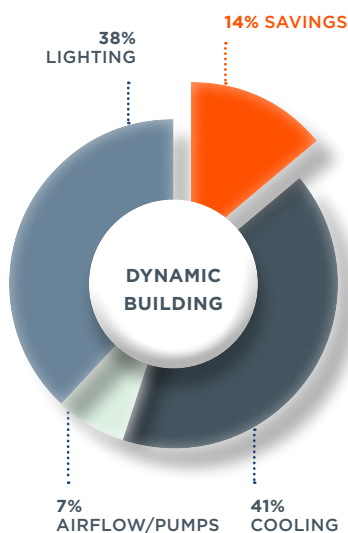
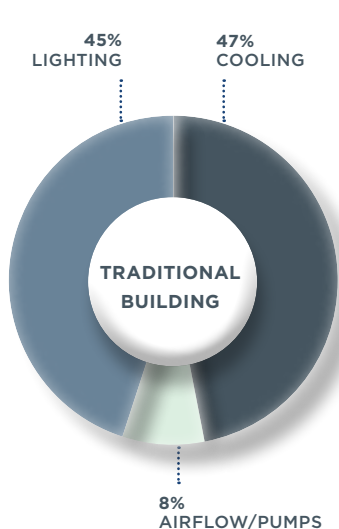
23% LOWER PEAK COOLING LOAD



Compare Low-Rise Workplace

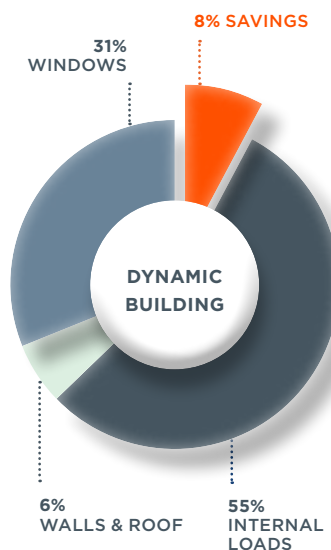
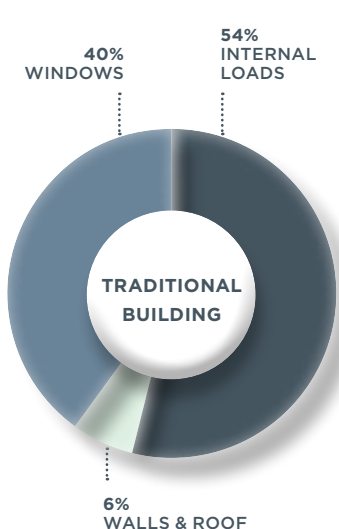
- 4 stories, 80K sf
- 40% window to wall punched-hole windows
- Packaged rooftop unit VAV
- Dynamic glass on E+W+S facades
- Traditional Low-e glass

ENERGY USE



14% ENERGY SAVINGS IN HVAC AND LIGHTING ELECTRICITY

PEAK LOAD



8% LOWER PEAK COOLING LOAD

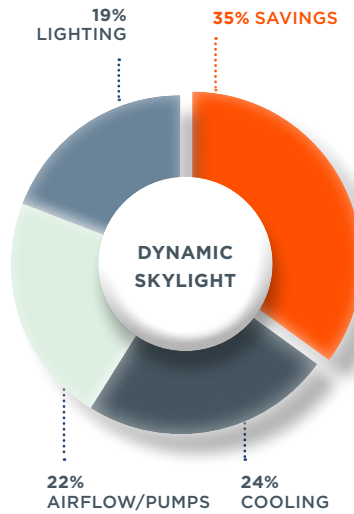
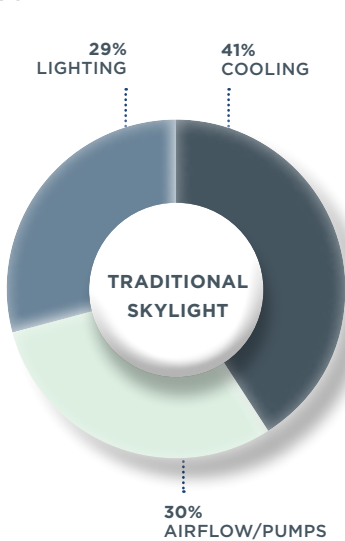
Dramatic Energy Savings for Skylights



Compare Skylights

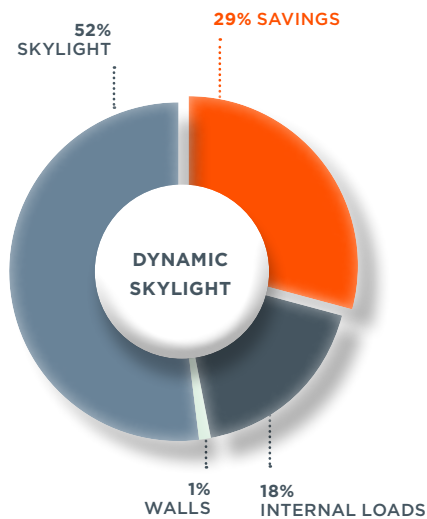
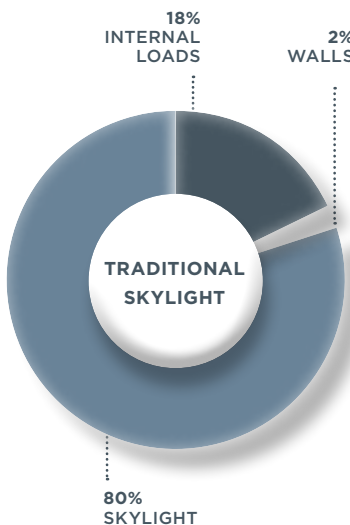
- 480 sf
- Single Pitch Skylight
- Traditional Low-e glass with laminated inboard lite

ENERGY USE



35% ENERGY SAVINGS IN HVAC AND LIGHTING ELECTRICITY

PEAK LOAD



29% LOWER PEAK COOLING LOAD

Healthcare & Education Benefits

HEALTHCARE BENEFITS

View Dynamic Glass increases daylighting:

- Patients with a day lit room spend 15-20% less time in hospital rooms compared to a non-day lit room¹
- Natural light and access to outdoor views accelerates healing and provides greater happiness

Doctors and staff can control windows remotely without entering rooms and interrupting patients.

Dynamic Glass is the perfect replacement for automated shades and integral blinds which are costly and susceptible to frequent maintenance and dust accumulation.



EDUCATION BENEFITS

Dynamic Glass provides enhanced daylighting and connection to views. Studies² show:

- classrooms with more daylighting are 20% faster in math and 26% faster in reading
- classrooms with larger windows are 15% faster in math and 23% faster in reading
- classrooms with controllable skylights show a 19-20% improvement in student performance

An ample and pleasant view out of a window supports better outcomes of student learning.

Sources of glare and direct sun penetration into classrooms negatively impact student learning.

Teachers who can control glare through windows experience improved student performance.



¹ Beauchemin, K.M. and P. Hays. (1996) *Sunny Hospital Rooms Expedite Recovery from Severe and Refractory Depression*. *Journal of Affective Disorders*, v.40, pp. 49-51.

² *Daylighting in Schools, An investigation into the Relationship Between Daylighting and Human Performance*. Heschong Mahone Group. August 1999.

The Fastest, Most Cost Effective Way to Advance your LEED Category



LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN (LEED)

LEED is the U.S. Green Building Council's green rating system.

**UP TO 28 POINTS
ACROSS MULTIPLE
CATEGORIES**

A PROVEN PATH TO ADVANCING YOUR LEED GOALS

Regulatory agencies are in the midst of updating their codes and standards to fully recognize the superior energy performance of dynamic glazing. Architects and building owners can use the performance path with View Dynamic Glass to demonstrate lower energy use than the baseline model and exceed code requirements.

Current building codes acknowledging dynamic glass in performance-driven design:

- International Energy Conservation Code, (IECC) - 2012
- California Energy Code, (Title 24, Part 6) - 2013
- International Code Council (ICC), International Building Code - 2015



ENERGY AND ATMOSPHERE (minimum energy performance)

View Dynamic Glass demonstrates clear improvements on energy performance. Our glass can contribute to the maximum of 18 points under the New Construction rating system (20 for healthcare projects and 16 for schools).

UP TO 18 PTS



INDOOR ENVIRONMENTAL QUALITY (thermal comfort)

View Dynamic Glass helps reduce unwanted solar heat gain in summer and captures passive heat gain in cooler seasons providing quality thermal comfort.

1 PT

INDOOR ENVIRONMENTAL QUALITY (daylight)

Occupants can enjoy natural light without suffering from glare.

3 PTS

INDOOR ENVIRONMENTAL QUALITY (quality views)

View Dynamic Glass reduces energy consumption and promotes the ability to add more windows for daylight and views, enabling occupants to stay connected to the outdoors.

1 PT

INDOOR ENVIRONMENTAL QUALITY (interior lighting)

View Dynamic Glass gives daytime occupants compatible control of light levels and glare in individual zones to contribute to an integrated interior daylighting strategy.

2 PTS



SUSTAINABLE SITES (light pollution reduction)

Skylights and windows that use View Dynamic Glass can be tinted at night to cut down on light trespass and sky glow, reducing impact on nocturnal environments.

1 PT



MATERIAL AND RESOURCES (building product disclosure and optimization—material ingredients)

View Dynamic Glass practices materials disclosure via the Health Product Declaration Collaborative and the Living Building Future Declare protocol.

2 PTS



PILOT CREDITS, BIRD COLLISION DETERRENCE

View Dynamic Glass reflects UV light. Since birds see in the ultraviolet range, the reflections let them see and avoid flying into façades minimizing injuries and death.

The above analysis is applied to LEED® v4 BD+C. For more information visit www.usgbc.org. View is a member of USGBC since 2000.

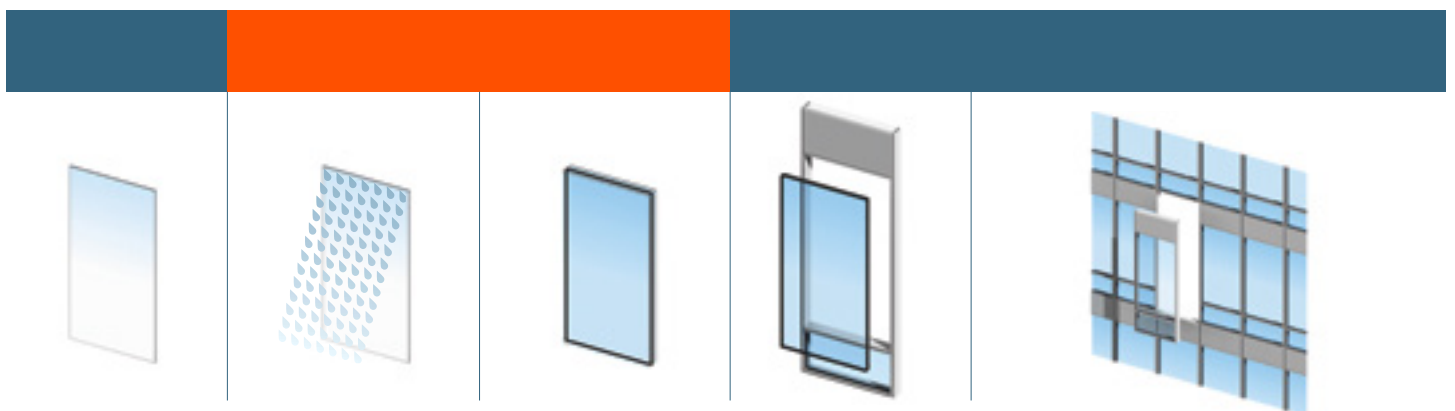
A New Standard for Customer Support

PROCESS AND ROLES

View provides an end-to-end solution and supports your project throughout all phases of design and installation, reducing time, cost and risk in installing dynamic glass.

	SCHEMATIC DESIGN	DESIGN DEVELOPMENT	BIDDING & CONTRACTING	MATERIAL PROCUREMENT	CONSTRUCTION	OCCUPANCY
ARCHITECT & OWNER	<ul style="list-style-type: none"> • Basis of Design (BOD) 	<ul style="list-style-type: none"> • Window schedule • Zone definitions 		<ul style="list-style-type: none"> • Submittal review 		<ul style="list-style-type: none"> • Certificate of Substantial Completion
GENERAL CONTRACTOR			<ul style="list-style-type: none"> • Divide scope amongst trades • Request bids • Award orders 	<ul style="list-style-type: none"> • Submittal review and scheduling 	<ul style="list-style-type: none"> • Install 	<ul style="list-style-type: none"> • Punchlist • Project close out
GLAZIERS & LOW VOLTAGE CONTRACTORS		<ul style="list-style-type: none"> • Design • Drawings 	<ul style="list-style-type: none"> • Pre-bid RFIs 	<ul style="list-style-type: none"> • Submit submittal package • Order glass and BOS 	<ul style="list-style-type: none"> • Install 	
VIEW INC.	<ul style="list-style-type: none"> • Product benefits • Specification guidance 	<ul style="list-style-type: none"> • Design assistance • Spec submittal • Energy & economic modeling • Dynamic Glass samples 	<ul style="list-style-type: none"> • Quotes • Scope guidance 	<ul style="list-style-type: none"> • Ship glass and BOS 	<ul style="list-style-type: none"> • Pre-task training • Install assistance • Commissioning 	<ul style="list-style-type: none"> • Post-commissioning • Customer support

CHANNEL INTEGRATION



COMPREHENSIVE WARRANTY

View offers the industry leading standard with the IGU warranted for ten (10) years, and the Balance of System (BOS) components warranted for five (5) years.

RELIABILITY: FULLY TESTED AND CERTIFIED

View Dynamic Glass is IGCC/IGMA certified. It is the only technology that passes ASTM accelerated durability testing which is equivalent of 50 years of switching between states.

DURABILITY

View's cabling components are highly reliable and have been used within the industrial automation industry for over 15 years. All connectors are preterminated for reliability and easy install.

only View offers...

Uninterrupted Views



Natural Light



Occupant Comfort



Intelligent Controls



Design Freedom



Energy Efficiency