

**view**

Dynamic Glass

**Product guide**





# 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 mitigate 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

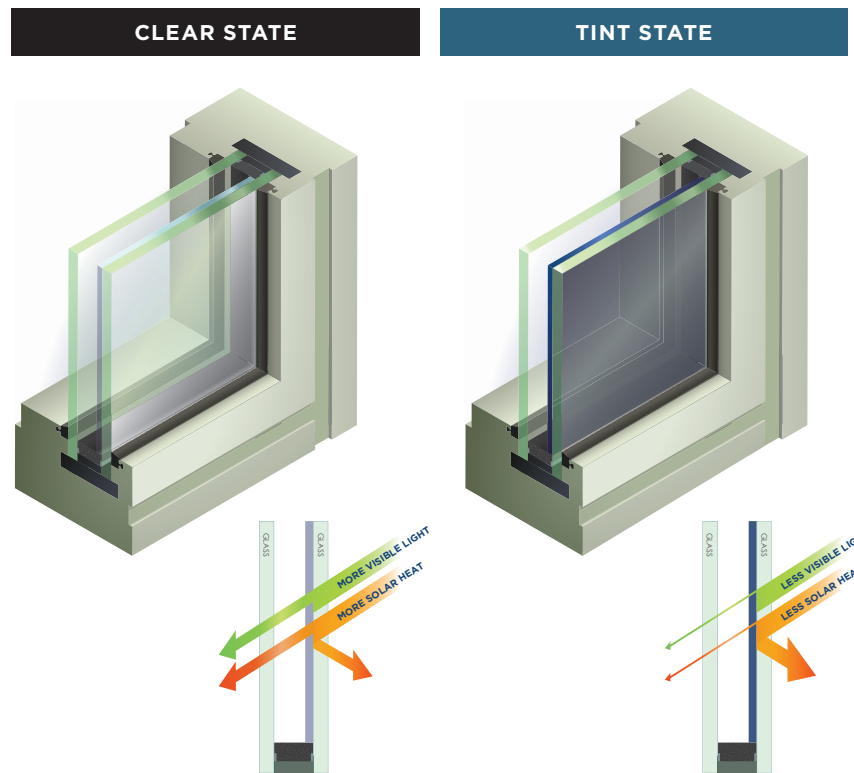
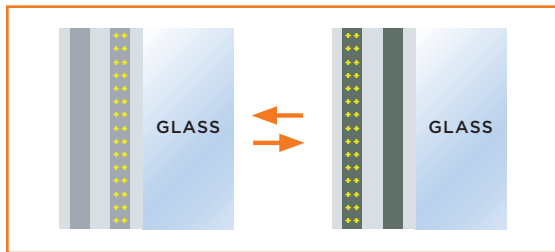
## Proprietary technology

A new generation of proprietary electrochromic technology:

- Enhanced window performance
- Sizes up to 6 x 10 ft without obstruction (no center busbar or perimeter light leaks)
- Long term durability
- Greater intelligence and control
- Lower overall cost

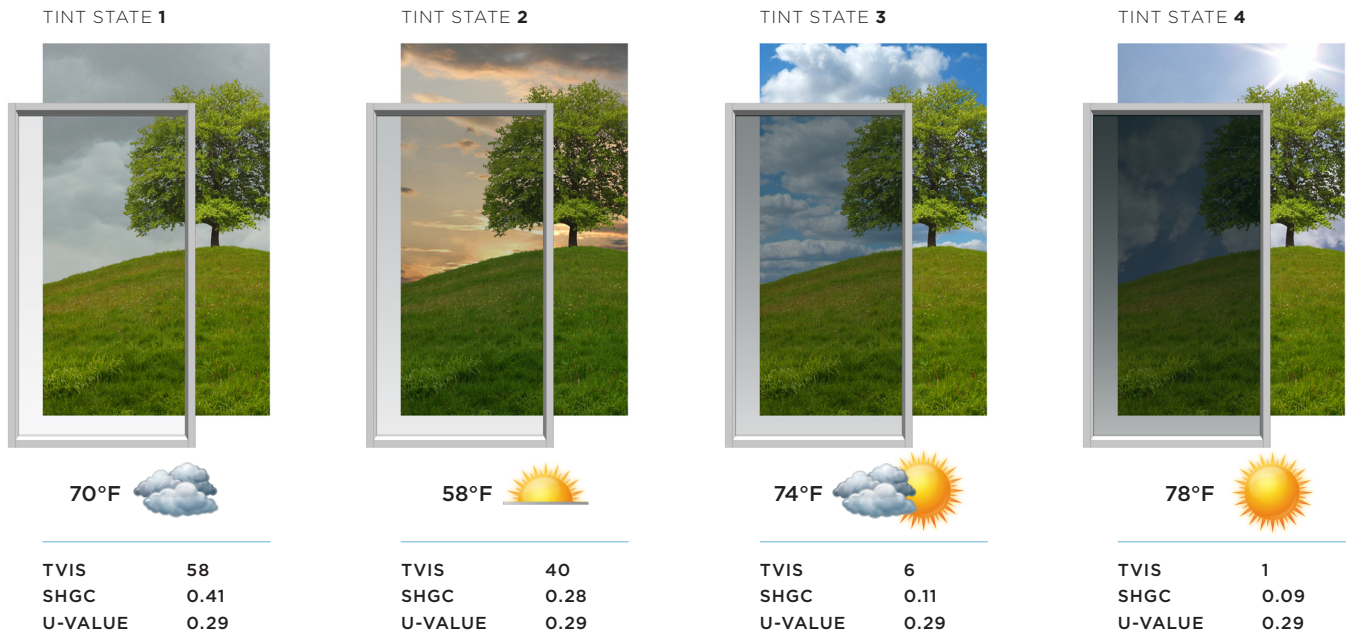
## Tints electronically

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.

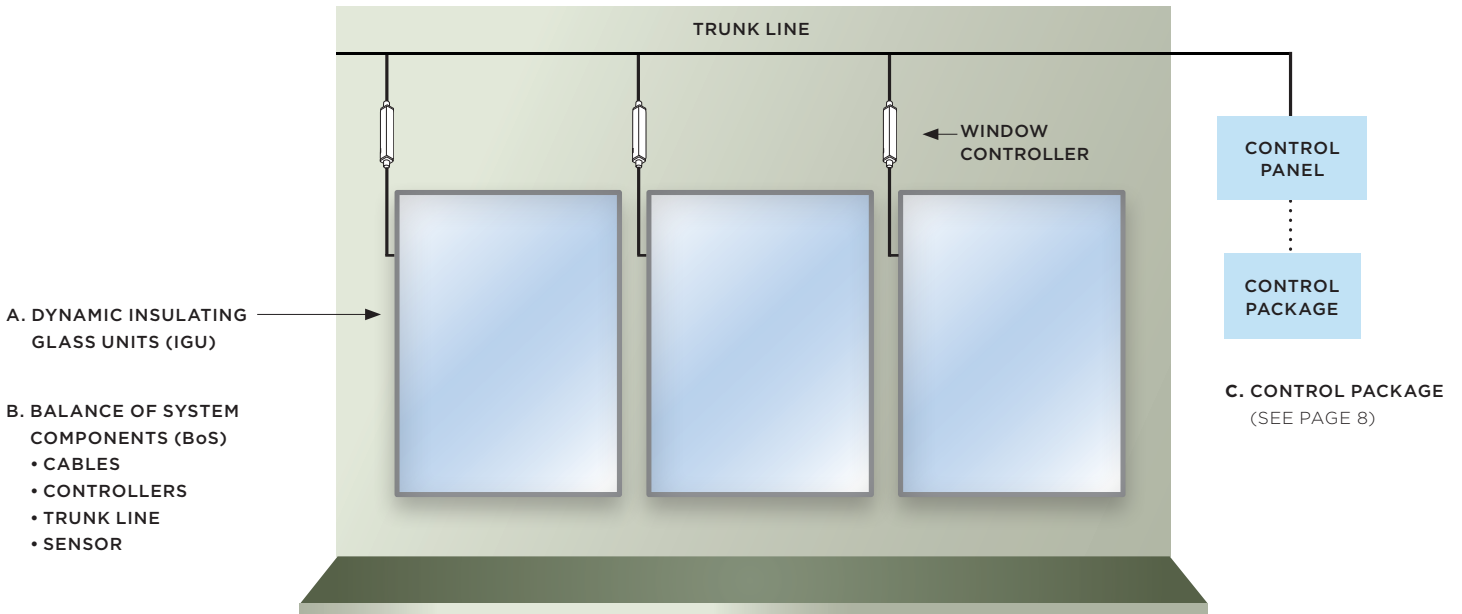




# Intelligent controls

## Dynamic Glass, dynamic controls

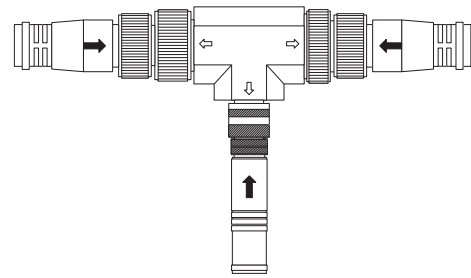
The View Dynamic Glass system is comprised of 3 core elements: A. the Dynamic Glass IGU; B. the Balance of System (BoS) components; and C. the Control Package.



## 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

## Customized systems

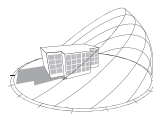
Easily configurable and controllable to meet user applications.

### FLEXIBLE

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

### CONFIGURABLE

- Programmable at any time
- Single- or multi-zoning



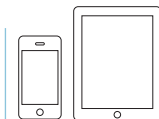
SOLAR POSITION CALCULATOR



SENSOR



BMS  
BUILDING MANAGEMENT SYSTEM



MOBILE APPS



WALL INTERFACE



SINGLE-ZONE



MULTI-ZONE

# Control package

## Multi-zone use

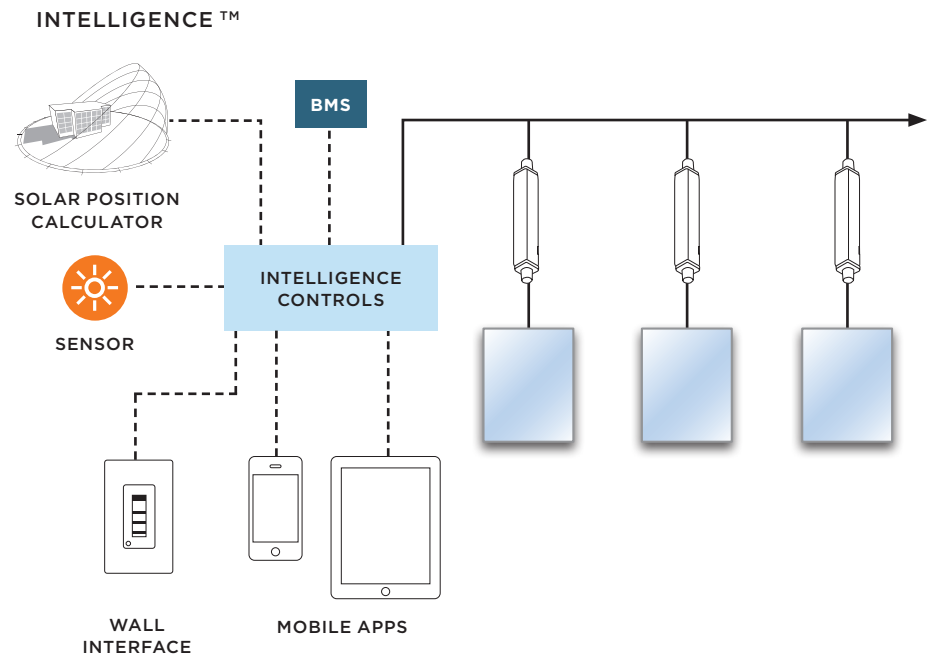
View Dynamic Glass offers control packages tailored to your specific application requirements.

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

## USER INTERFACE

Mobile app (iOS, Android)

Wall interfaces *optional*



- Other sizes, colors, and thicknesses available based on specification.
- An IGU installed 2,500 ft above sea level will include 100% air and an open capillary tube installed on the corner closest to the pigtail running down several inches through the secondary seal.
- The inner ply of a tinted laminated lite is colored.
- View Dynamic Glass transitions from the long edges of the glass inward to the center. Transition speed varies by the size.
- Any tempered lite with a base dimension > 84" will exhibit vertical roll wave distortion rather than 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.
- The overall thickness of the IGU may vary within the glass thickness tolerance stated in ASTM C1036 and the air space thickness tolerance stated in ASTM E2190.
- Dynamic coating meets or exceeds specifications for scratches, pinholes, and defects stated in ASTM C1376.

# Guaranteed performance specifications

IGU PERFORMANCE TABLE

TINT LEVEL	TRANSMITTANCE (%)			REFLECTANCE (%)			U-VALUE (BTU/HR. FT <sup>2</sup> F)	SOLAR HEAT GAIN COEFFICIENT
	VISIBLE	UV	SOLAR	VISIBLE OUT	VISIBLE IN	SOLAR OUT		
TINT 1	58	4	34	15	18	15	0.29	0.41
TINT 2	40	3	21	12	17	12	0.29	0.28
TINT 3	6	1	2	9	16	11	0.29	0.11
TINT 4	1	0	1	10	17	12	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 7.4 software.

VIEW DYNAMIC GLASS – Standard options (other configurations available on request)									
<b>Type</b>	Dual pane / Triple pane								
<b>Shape</b>	Squares, rectangles Right-angled trapezoids and triangles								
<b>Dimensions</b>	Maximum 72" x 120" (1,828mm x 3,048mm) Minimum 14" x 14" (356mm x 356mm) Maximum overall thickness 2" (52mm)								
<b>Outboard lite</b>	<table border="0"> <tr> <td>Thickness</td> <td>¼" (6mm)</td> </tr> <tr> <td>Strength</td> <td>Tempered, heat-strengthened</td> </tr> <tr> <td>Color</td> <td>Clear</td> </tr> <tr> <td>Coating</td> <td>Dynamic coating on #2 surface</td> </tr> </table>	Thickness	¼" (6mm)	Strength	Tempered, heat-strengthened	Color	Clear	Coating	Dynamic coating on #2 surface
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<b>Inboard laminate</b>	<table border="0"> <tr> <td>Thickness</td> <td>6mm / 5mm / 4mm for each pane in laminate</td> </tr> <tr> <td>Strength</td> <td>Tempered, Heat Strengthened, Annealed</td> </tr> <tr> <td>Interlayer</td> <td>Clear / 0.06" PVB / Clear Clear / 0.09" PVB / Clear Clear / 0.09" SGP / Clear</td> </tr> </table>	Thickness	6mm / 5mm / 4mm for each pane in laminate	Strength	Tempered, Heat Strengthened, Annealed	Interlayer	Clear / 0.06" PVB / Clear Clear / 0.09" PVB / Clear Clear / 0.09" SGP / Clear		
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Interlayer	Clear / 0.06" PVB / Clear Clear / 0.09" PVB / Clear Clear / 0.09" SGP / Clear								
<b>Spacer materials and thickness</b>	Foam Super Spacer® T-Spacer™ (black) ½", ⅝" (12.7mm, 15.9mm)								
<b>Gas fill</b>	>90% Argon, <10% Air 100% Air*								
<b>Seal</b>	<table border="0"> <tr> <td>Primary</td> <td>PIB</td> </tr> <tr> <td>Secondary</td> <td>Silicone</td> </tr> </table>	Primary	PIB	Secondary	Silicone				
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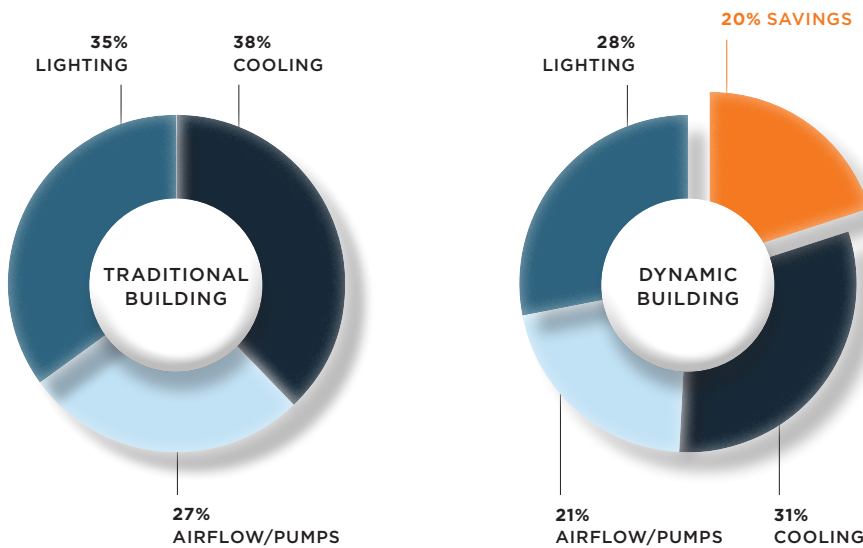
# Dramatic energy savings for workplace



## Compare high-rise workplace

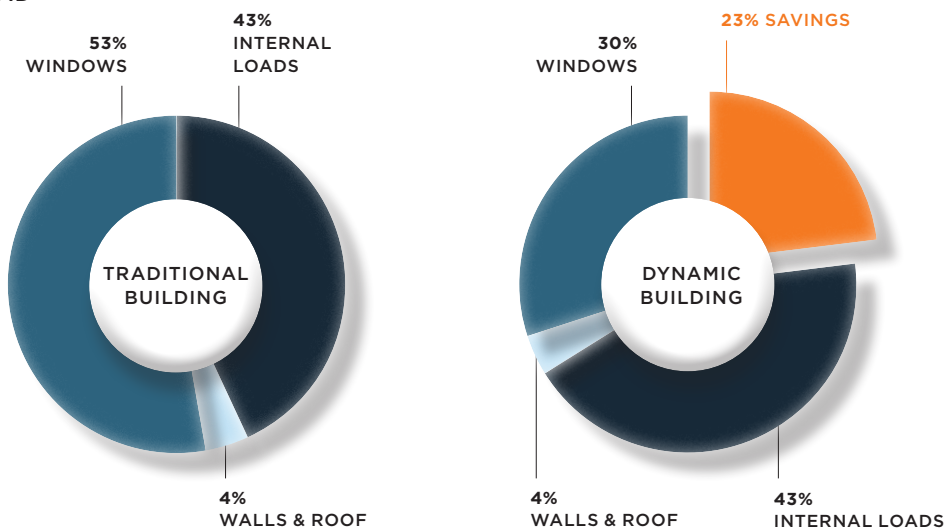
- 20 stories, 400K sq ft
- 50% window to wall
- Unitized curtain wall
- Central plant VAV
- Traditional: Low-e glass with laminated inboard lite
- Dimmable light
- Manual shades on traditional building

### ENERGY USE



**20% ENERGY SAVINGS IN HVAC AND LIGHTING ELECTRICITY**

### PEAK LOAD



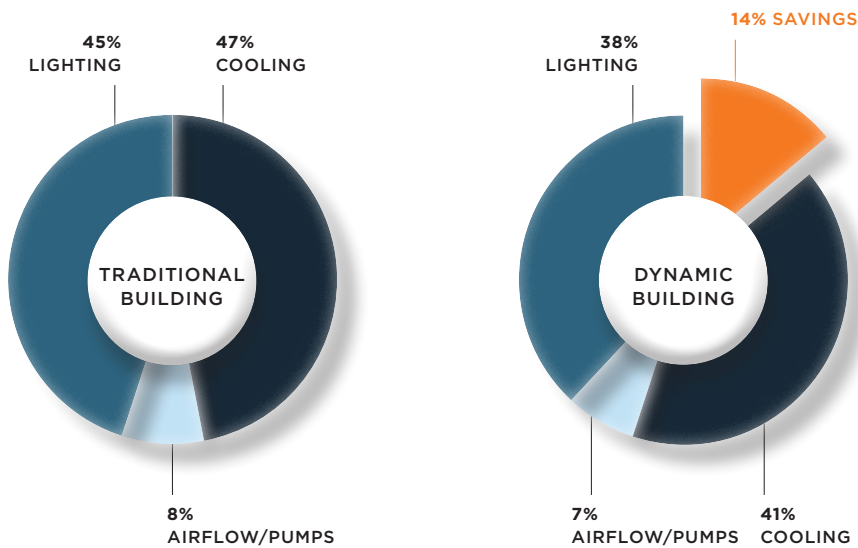
**23% LOWER PEAK COOLING LOAD**



## Compare low-rise office

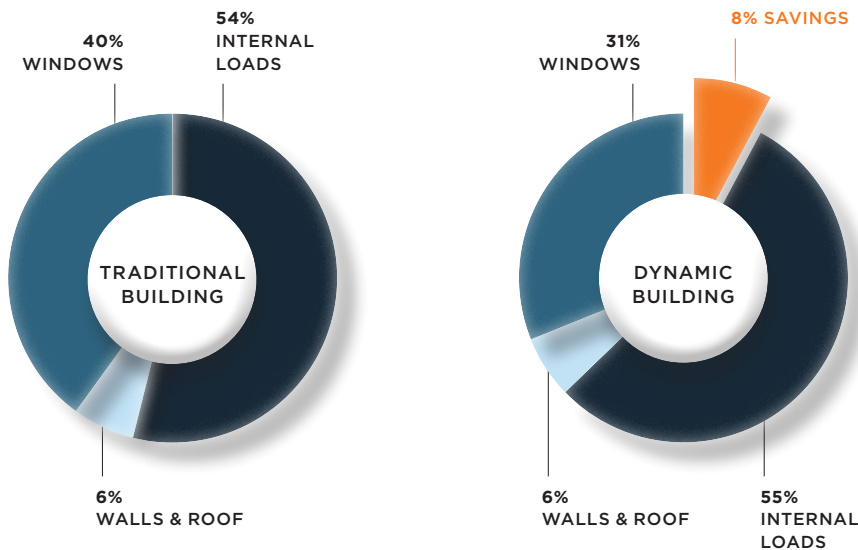
- 4 stories, 80K sq ft
- 40% window to wall punched-hole windows
- Packaged rooftop unit VAV
- Dynamic glass on E+W+S facades
- Traditional Low-e glass

### ENERGY USE



**14% ENERGY SAVINGS IN HVAC AND LIGHTING ELECTRICITY**

### PEAK LOAD



**8% LOWER PEAK COOLING LOAD**

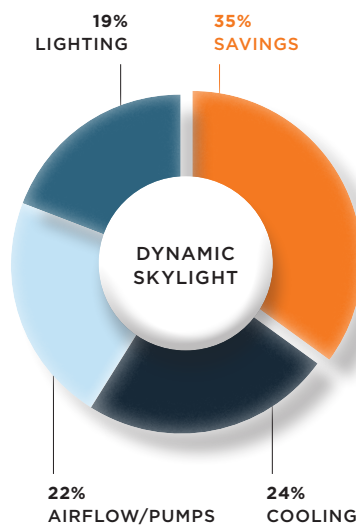
# Dramatic energy savings for skylights



## Compare skylights

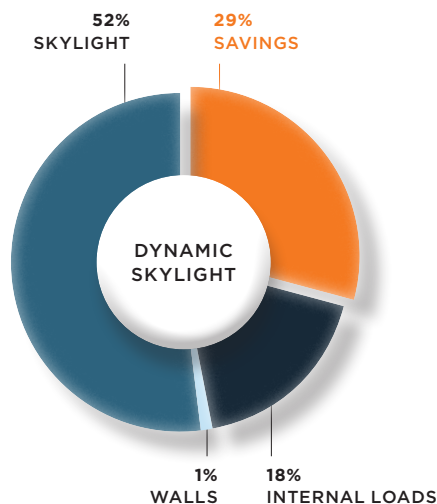
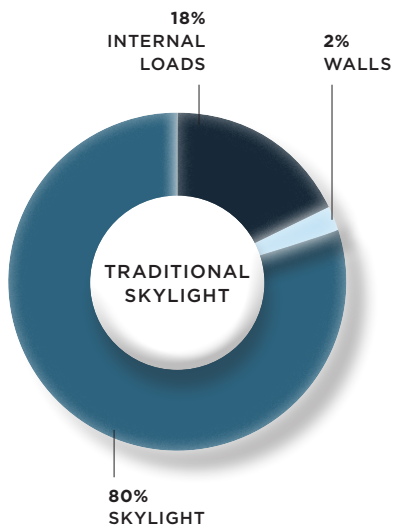
- 480 sq ft
- Single pitch skylight
- Traditional Low-e glass with laminated inboard lite

### ENERGY USE



**35% ENERGY SAVINGS IN HVAC AND LIGHTING ELECTRICITY**

### PEAK LOAD



**29% LOWER PEAK COOLING LOAD**

# Healthcare and 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 room<sup>1</sup>
- 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. Studies<sup>2</sup> 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.



<sup>1</sup> 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

<sup>2</sup> *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.

## EARN POINTS IN MULTIPLE CREDIT 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)

**UP TO 18 PTS**

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).



### INDOOR ENVIRONMENTAL QUALITY (thermal comfort)

**1 PT**

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

### INDOOR ENVIRONMENTAL QUALITY (daylight)

**3 PTS**

Occupants can enjoy natural light without suffering from glare.

### INDOOR ENVIRONMENTAL QUALITY (quality views)

**1 PT**

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.

### INDOOR ENVIRONMENTAL QUALITY (interior lighting)

**2 PTS**

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



### SUSTAINABLE SITES (light pollution reduction)

**1 PT**

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.



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

**2 PTS**

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



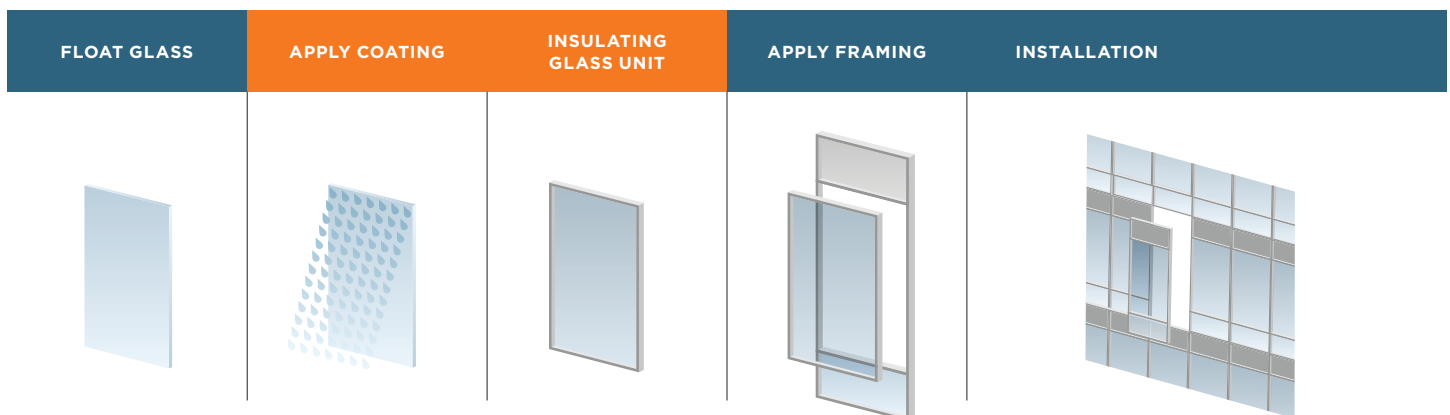
# A new standard for customer support

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

## CHANNEL INTEGRATION



### COMPREHENSIVE WARRANTY

View offers the industry leading standard with the IGU warrantied for 10 years, and the Balance of System (BoS) components warrantied for 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