



SageGlass®

DARE TO BE DYNAMIC

PRESS BRIEFING

For all press inquiries contact:

Mallory Horshaw
Brownstein Group for SageGlass
267.238.4139
SageGlass@BrownsteinGroup.com



SAINT-GOBAIN



About SageGlass

SageGlass®

SageGlass® is the pioneer of the world's smartest electrochromic glass and is transforming the indoor experience for people by connecting the built and natural environments. Electronically tintable SageGlass, a product of Saint-Gobain, dynamically optimizes daylight and manages temperature – all while maintaining unobstructed views of the outdoors. With SageGlass, building occupants can comfortably experience the biophilic benefits of the outdoors, including stress reduction, enhanced creativity and an improved sense of well-being. Unlike conventional sun controls such as mechanical window shades or blinds.

SageGlass allows architects to elegantly solve solar control challenges without sacrificing aesthetics and design. As a wholly owned subsidiary of Saint-Gobain, SageGlass is backed by 350 years of building science expertise that only the world leader in sustainable environments can provide. Ready to look again? Visit www.SageGlass.com, [@Sage_Glass](https://www.facebook.com/SageGlass), [Facebook.com/SageGlass](https://www.facebook.com/SageGlass).

About Saint-Gobain



Saint-Gobain is the world leader in sustainable environments – designing, manufacturing and distributing materials and solutions which are key ingredients in the wellbeing of each of us and the future of all. They can be found everywhere in our living places and our daily life: in buildings, transportation, infrastructure and in many industrial applications. They provide comfort, performance and safety while addressing the challenges of sustainable construction, resource efficiency and climate change.

Saint-Gobain has designed and manufactured high-performance building materials all over the world. From the Hall of Mirrors at Versailles and the glass pyramid at the Louvre, to The Statue of Liberty and The World Trade Center, and even components that allow the Mars Rover Curiosity to seek out life on another planet, Saint-Gobain has been a part of the fabric of human history, advancement and improvement.



OPEN UP YOUR WORLD

SageGlass eliminates the need for blinds and shades, so you can experience the unobstructed beauty of the outdoors and enjoy windows the way they're meant to be enjoyed.



Traditional

SageGlass

BENEFITS

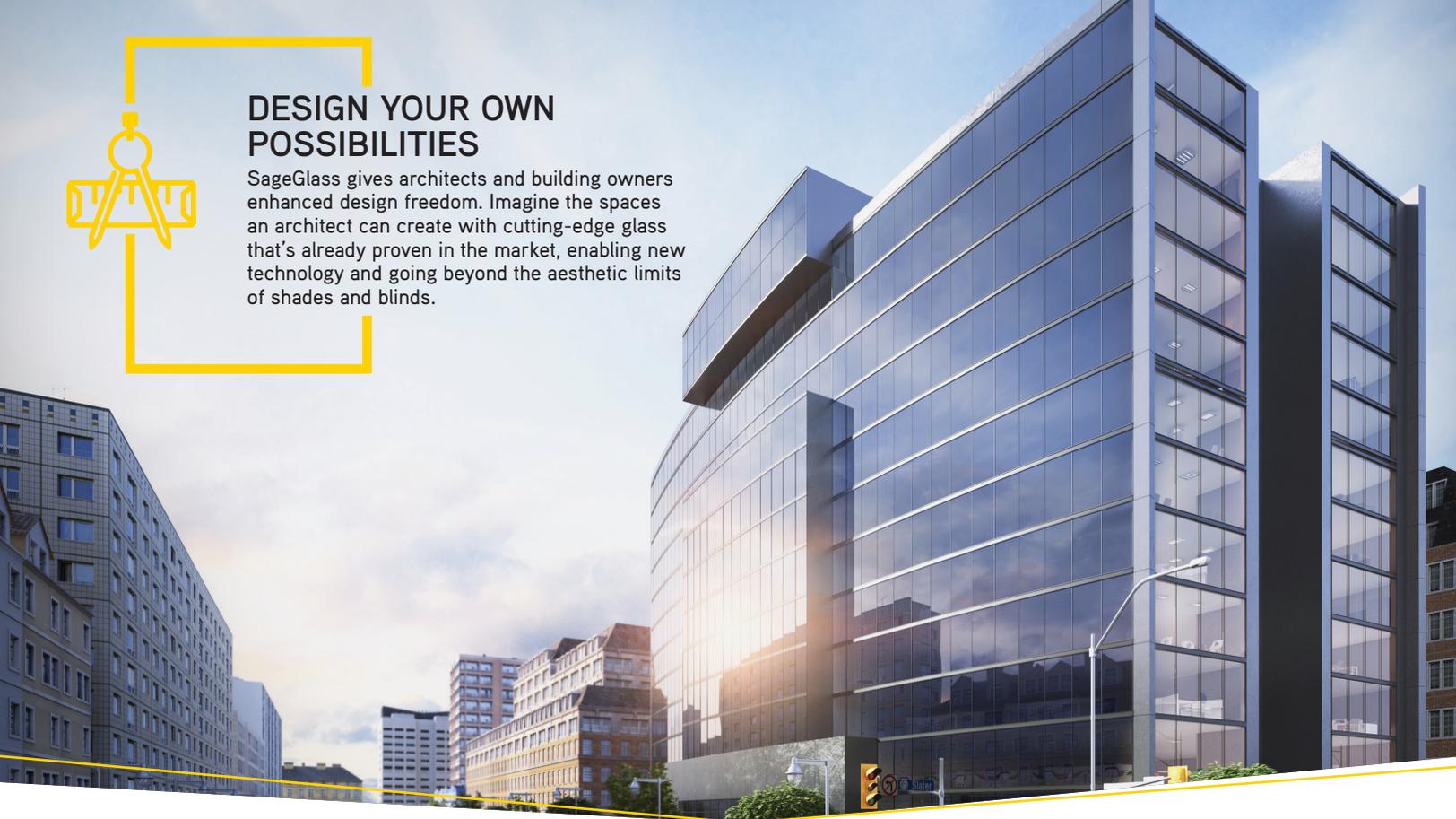
SageGlass represents nothing less than a fundamental shift in the way we experience buildings—the ultimate connector between our built and natural environments. Come discover the benefits of tintable electrochromic glass.

- Health and well-being are inextricably linked to nature, and our connection to the outdoors is part of our biological inheritance, yet all too often we live alienated from nature. In fact, average Americans spends 93% of their lives indoors – that equates to just one half day each week spent outside. Alienation from nature does not need to be an inevitable consequence of modern life. SageGlass provides architects the opportunity to address this problem by deliberately designing an occupant-centric built environment that offers an unobstructed connection to the natural environment.
- The relationship between nature, human biology and the design of the built environment hinges on having a connection to the outdoors. SageGlass is the connector between the built and natural environments.
- Unlike blinds, shades and films, electrochromic glass allows building occupants to experience the biophilic benefits of the outdoors, including stress reduction, enhanced creativity and clarity of thought and an improved sense of well-being.
- Maintaining a connection with the outdoors has a transformative physiological impact on the building occupant, but it can also have a transformative impact on building design. Allowing the architect to fully realize his or her vision without compensating aesthetics for solar control.
- Some of the best new buildings are those that challenge our ideas of conventional architecture – but don't challenge the environment. Building designs that embrace and respond to the local environment, as opposed to trying to thwart nature with mechanical systems, are seeing a 21st-century revival. SageGlass provides thermal and visual comfort, making use of advanced solar control technologies. By maintaining a connection to the outdoors and climate zone, SageGlass enhances occupant comfort with little need for energy-intensive HVAC systems.



DESIGN YOUR OWN POSSIBILITIES

SageGlass gives architects and building owners enhanced design freedom. Imagine the spaces an architect can create with cutting-edge glass that's already proven in the market, enabling new technology and going beyond the aesthetic limits of shades and blinds.



EXPERIENCE

SageGlass represents nothing less than a fundamental shift in the way we experience buildings – the ultimate connector between our built and natural environments.

- Electrochromic glass was pioneered by SageGlass in 1989, and its first building application followed in 2003 at Desert Regional Medical Center in California. Since then SageGlass has installed electrochromic glass in many projects and iconic buildings worldwide – including iconic buildings like the Mall of America in Bloomington, Minn., the Kimmel Center for the Performing Arts in Philadelphia, and the Museum of Science in Boston.
- SageGlass is relatively new product, but it's backed by 350 years of building science expertise that only Saint-Gobain, the world leader in sustainable environments, can provide. From the Hall of Mirrors at the Palace of Versailles and the glass pyramid at the Louvre, to the Statue of Liberty and The World Trade Center, Saint-Gobain has been a part of the fabric of human history, advancement and improvement for three-and-a-half centuries – and upholds that heritage through its family of companies, including SageGlass.

SageGlass has provided electrochromic glass to over 700 projects worldwide.

From office spaces to universities, energy-efficient smart glass can complement the style of any building. See how SageGlass has worked to bring beautiful, dynamic smart glass solutions across a variety of industries.



HIGHER EDUCATION



HEALTHCARE



COMMERCIAL OFFICES



CULTURAL INSTITUTIONS



HIGHER EDUCATION

From Frost School of Music at the University of Miami in Florida to Chabot College in California, SageGlass has allowed higher education facilities to increase natural light with no glare and little or no HVAC needed – the result is a more comfortable space that is conducive to cognitive thinking thanks to unobstructed views of the outdoors.

The application of SageGlass in higher education is especially valuable when you consider the impact natural light has on learning. In fact, research suggests that students progressed through curricula 20%–26% faster when learning in daylight environments.



HEALTHCARE

When it comes to healthcare, the therapeutic benefits of natural light also translate to economic benefits. In 2010, the United States spent \$40 billion on healthcare construction. If biophilic design strategies, including access to daylight and views of nature, are considered during the construction phase, the facility stands to cut operational costs that compound over the span of a hospital's life cycle. Breaking down the impact of daylight and views of nature into economic terms yields a significant cost reduction to the patient and the hospital at large.

Studies have linked faster recovery rates for patients, decreased dependency on medication, reduced staff and family stress and improved emotional wellness to natural daylighting and views of nature. SageGlass helps optimize the therapeutic benefits of natural light while controlling the sun.



COMMERCIAL OFFICES

Offering employers a workspace that connects employees to the natural environment is not just a luxury, but a sound economic investment in health and productivity, based on well-researched neurological and physiological evidence. A study at the University of Oregon found that 10% of employee absences could be attributed to architectural elements that did not connect with nature, and that a person's view was the primary predictor of absenteeism.

Corporate offices spend, on average, over 100 times the amount of money on people as on energy costs in the workplace. Using 2009 values, the cost per square foot of a given corporate office space is overwhelmingly devoted to salary; 90% of costs per square foot are funneled toward salary, while only 9% is paid toward rent and mortgage, and 1% represents energy costs. If the productivity per square foot can be increased by increasing daylight and views of the outdoors, employers can begin to understand how a connection to the outdoors boosts the bottom line.

The main causes for deficient workplace productivity include absenteeism, loss of focus, negative mood and poor health. The built environment, though not always the cause of these stressors, when well-designed with daylight and views of the outdoors, can relieve these undesirable symptoms.

The four strongest requirements that, if neglected, can trigger worker productivity problems can all be solved with daylight and a connection to the outdoors:

1. Need for change (varying temperature, air, light, etc.)
2. Ability to act on the environment and see the effects
3. Meaningful stimuli (stagnant atmospheres cause an onset of chronic stress)
4. View to the outside world



CULTURAL INSTITUTIONS

From the Kimmel Center for the Performing Arts in Philadelphia to the Museum of Science in Boston, SageGlass has allowed some of the country's best cultural institutions to deliver a better visitor experience that includes views of the outdoors, while also protecting historic collectables from the sun's damaging rays.

Preserving the visitor experience is top of mind for today's owners and curators, but just as important is the need to unlock additional revenue streams.

By using SageGlass, the Kimmel Center transformed a previously unusable rooftop garden terrace into a comfortable social space with breathtaking cityscape views. The temperature used to climb to 100+ degrees prior to SageGlass being installed; now the space is as comfortable as it is elegant, making it an in-demand wedding venue.

Many of the best museums and cultural institutions also have breathtaking views of the surrounding urban landscape, but those views are often obstructed in favor of controlling sun glare; as a result, the visitor experience suffers. Nearly all solar control options available that could address this problem would result in compromises to building performance and/or the visitor experience, with the exception of SageGlass, which solves sun glare, saves energy, reduces dependency on HVAC systems, preserves the view of the outdoors and most importantly – improves the visitor experience.

By taming the sun's glare, SageGlass has also enabled the Museum of Science in Boston to utilize the indoor space and the connection to the river in new ways. A new exhibit opening in early 2016, Yawkey Gallery on the Charles River, will allow visitors to explore how nature and technology are intertwined along the Charles River Watershed in the lobby where the previous curtain wall would have made the exhibit impossible.



ENERGIZE THE EVERYDAY

SageGlass reduces glare and heat by giving you the perfect tint for the time of day, so you can take control of your comfort all day and live every moment more fully.



PRODUCT

SageGlass doesn't just improve buildings—it inspires a new way of thinking about glass. By creating a product that tints on demand and improves the human experience in a built environment, we've revolutionized the purpose and possibilities of glass.

- Perfected by over 500 U.S. patents and manufactured by a team of 160 American workers, SageGlass makes one product: the world's most intelligent, reliable electrochromic glass that is as dynamic as the people it surrounds.
- SageGlass believes it is time to transform the modern-day indoor living experience by connecting the built environment with the natural environment – all in the name of a better indoor experience for building occupants – and it starts with smarter windows.
- SageGlass controls sunlight to optimize daylight, outdoor views and comfort while preventing glare, fading and overheating. By letting sunlight in on cool days and blocking it on hot days, SageGlass dramatically reduces energy demand and the need for HVAC, while increasing occupant comfort and well-being.
- Guided by the need to connect the built and natural environments, but also create a comfortable indoor space, SageGlass puts IEQ on demand by allowing users to create up to three variable tint zones within a single pane of SageGlass. Custom-zoning strategies can even use dynamic control to track the sun as it moves across the sky so that occupants can always strike the ideal balance of comfort and daylighting.
- With integrated solar cells that provide self-contained power, the biophilic benefits of electrochromic glass can be achieved with no electrical wiring, making SageGlass ideal for retrofits and challenging applications like skylights, curtain walls and clerestory windows.
- We know glass to be one of the most beautiful architectural mediums to use, so we've advanced the core SageGlass product to be available without a center bus bar in any size glazing up to 5' x 10'. While the thin electrical conduit does provide faster tinting and tint uniformity, we know some designs demand the pure aesthetic elegance of glass without the bar.
- Control means nothing if you cannot rely on it, that's why SageGlass performs exactly as we say it will – when we say it takes seven minutes to achieve full tint, we mean it. It also has proven its mettle in testing across a range of harsh environmental conditions for more than 15 years, outperforming in durability tests by independent third-party organizations including the U.S. Department of Energy (DOE) and major industry glass companies.



LARGEST ELECTROCHROMIC GLAZING PLANT IN THE WORLD

The 324,000-square-foot High Volume Manufacturing (HVM) facility is capable of producing millions of square feet of dynamic glass annually, making it the largest electrochromic glazing plant in the world. The HVM facility features numerous state-of-the-art manufacturing technologies and product enhancements that have enabled SageGlass to set a new standard for electrochromic glazing and manufacture glass for hundreds of projects including commercial office buildings, schools and universities, and healthcare facilities.

The HVM facility is a model of green manufacturing. It achieved Gold certification under the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED®) rating system in June 2014. The SageGlass facility earned LEED points toward Gold certification for, among other features, its efficient use of water, limiting of light pollution, and attention to indoor environmental quality including abundant use of daylighting and access to outside views for employees.

LOCATION: 2 Sage Way, Faribault, MN 55021

EMPLOYEES: 236 and growing

OPENED: 2012

LEED: Gold-Certified in June 2014

A SHARED PERSPECTIVE

The SageGlass team is a group of thinkers, designers and innovators out to change the way people think about glass.



Alan McLenaghan PhD
CEO



John Van Dine
Founder & Vice Chairman



Jean-Christophe Giron
Vice President
R&D and Product
Development



Mark Jarrett
Finance Director



Francis O'Neill
North American
Sales Director



David Pender
Director of Operations



Derek Malmquist
Director of
Customer Experience



Charles Hayes
Vice President
Administration & HR Director



Lou Podbelsk, AIA, CSI
Vice President,
Architectural Solutions



Ryan Park
Global Marketing
Director

Visit SageGlass.com to view more of our team members

LEARN MORE ABOUT SAGEGLASS

Q: What is SageGlass?

A: SageGlass is a leading electronically tintable glass for windows, skylights and curtain walls. It tints automatically or on demand to control sunlight, without shades or blinds, maintaining your connection to the outdoors and reducing energy consumption. The technical term is electrochromic glass or dynamic glass.

Q: What is SageGlass for?

A: SageGlass maximizes interior daylight, preserves views and keeps people connected to the outdoors, making them happier, healthier and smarter. SageGlass also saves energy by harnessing the sun's warming rays in winter and deflecting them on hot summer days.

Q: Is SageGlass better suited to some types of buildings?

A: SageGlass has been incorporated into a wide variety of commercial buildings and is a good fit for any project where controlling the sun is a challenge. Some of the leading types of projects where SageGlass has been used include commercial offices, schools and universities, healthcare facilities, cultural institutions, government facilities and skylights in a wide variety of buildings.

Q: Why should I consider electrochromic glass instead of conventional glass or solar control solutions?

A: Electrochromic glass such as SageGlass is energy-efficient and it removes the need for shading devices that can block our view of the outdoors and are less sustainable.

Buildings are arguably our country's greatest energy liability. They consume nearly 40 percent of our total energy and 68 percent of our electricity while emitting 38 percent of CO2 into the atmosphere annually. Energy lost through conventional windows accounts for approximately 30 percent of heating and cooling energy, according to the US Department of Energy.

Shades, blinds, louvers, fins or other mechanized sun control devices sever our connection to the outdoors and add to a building's environmental impact. Prior to SageGlass, there was no viable way to provide natural daylight and an outdoor view while simultaneously controlling glare, heat gain and energy use.

Q: Does SageGlass require power?

A: It takes less electricity to operate 2,000 square feet (186 square meters) of SageGlass than it does to power a single 60-watt light bulb.

Q: What is the largest available size of SageGlass?

A: The largest size is 5 feet by 10 feet (1524 mm x 3048 mm).

Q: How can I use SageGlass?

A: SageGlass has been incorporated into a wide variety of commercial, institutional and even selected residential buildings – anywhere you'd like to bring in daylight, keep people comfortable, and give them an uninterrupted outdoor view and connection to the outdoors. Because it conserves energy, SageGlass is ideal for sustainable buildings. It also prevents fading, which protects interior spaces. Here are some particularly good matches for SageGlass:

- Commercial office spaces
- Schools and universities
- Healthcare facilities
- Museums
- Libraries
- Religious facilities
- Aviation facilities
- Atriums, skylights, and overhead glazings

Q: Can I "set it and forget it?"

A: Yes, SageGlass can be tinted and cleared automatically, manually or integrated with a building automation system. But you always have the ability to manually override the automatic settings by a wall switch if so desired.

Q: Does SageGlass help protect my interior against sun damage?

A: Yes, when tinted, SageGlass blocks 99 percent of the solar radiation that causes damage to materials.

Q: What's not sustainable about traditional solar control products?

A: When you factor in all the materials, manufacturing, transportation, installation, maintenance and operational energy they consume, the carbon footprint is significant. That's a big concern if you're striving for a sustainable building. SageGlass is a green technology that can conserve energy and increase a building's value.

Q: Is SageGlass available in more than one color?

A: Yes, SageGlass is available in a variety of colors to complement your design or building.

FAQS

Q: Can you match SageGlass with other glass in my building?

A: Whether dynamic or traditional, two pieces of glass from different sources rarely match exactly. When glass from multiple sources is installed in separate areas of a building, which happens a lot, slight mismatches are often undetectable. When there is no separation on the building between the two types of glass, you can order SageGlass in a color that complements the adjacent glass.

Q: Does SageGlass products provide privacy?

A: SageGlass is not privacy glass. It provides some privacy since it transmits less than 1 percent of the visible light in its darkest state. When the glass is fully tinted on a sunny day, it's nearly impossible to see through the glass from the outside. But since SageGlass windows and skylights are intended to preserve outdoor views, they don't provide 100 percent privacy in any state.

Q: What shapes are available?

A: We offer rectangles, squares, parallelograms, trapezoids and triangles.

Q: Do SageGlass windows and skylights help me get LEED credits?

A: Yes, SageGlass can contribute to achieving points for your future LEED® project in up to 11 credit areas.

Q: Where has SageGlass been installed?

A: We have completed over 700 installations since our first commercial project in a hospital in California in 2003. Our glass has been installed in healthcare facilities, offices, schools and homes. We have projects throughout the United States, Europe and elsewhere. See our portfolio for examples.

Q: Are SageGlass products considered "low-emissivity"?

A: Yes, the SageGlass coating has a low-e surface, so it provides all of the advantages of a spectrally selective low-e product (even in its clear, untinted state). Low-e coatings help keep heat in when it's cold outside, and keep it out when it's hot.

Q: What is the dynamic range of the glass?

A: SageGlass can be varied from 60 percent visible light transmission in its clear state down to 1 percent in its tinted state, with a solar heat gain coefficient that varies from 0.41 on the high end to 0.09 on the low end.

Q: Is there a warranty on SageGlass products?

A: We warranty the SageGlass IGU for up to 10 years depending on the building application; the electronics, electrochromic functionality and coatings carry a five-year warranty.

Q: How does SageGlass technology work?

A: We coat SageGlass panes with five layers of ceramic materials for a total thickness of less than 1/50th that of a human hair. When voltage is applied across the coatings, ions travel from one layer to another layer, prompting a reversible solid-state change that causes the coating to tint and absorb light. In other words, the glass gets darker. Reversing the polarity of the applied voltage causes the ions to migrate back to their original layer, untinting the glass.

Q: How is SageGlass manufactured?

A: We use a vacuum deposition process called "sputtering" to coat conventional float glass with layers of metal oxides. This is the same process used to make low-e and double low-e glass. The coated SageGlass pane is then paired with one or two more pieces of glass (clear, tinted or laminated) and one or two spacers to make a double-pane or triple-pane insulating glass unit (IGU). Our state-of-the-art manufacturing facility is located in Faribault, Minnesota.

Q: Are there intermediate tint levels?

A: Yes, with the SageGlass control system, you can select preset tint levels between the low and high ends of the glass's dynamic range (1 percent – 60 percent). You can also program the SageGlass control system to maintain a constant light level inside the space throughout the day. In this case, sensors integrated with the framing will tell the glass how to respond to changing light conditions outside.

Q: Can I control SageGlass wirelessly?

A: Yes, when you integrate it with a building automation system, SageGlass adopts that system's remote control capabilities.

Q: What control system options are available?

A: SageGlass comes with a standard panel-mounted control system. You can operate it via a simple wall switch, our automation system, or a building automation system that is controlling lighting, energy use, audiovisual equipment and security. When integrated with a building automation system, you can control SageGlass windows, skylights and curtain wall elements by inputs from timers, light sensors, motion sensors, lighting control, thermostats and more.

FAQS

Q: How fast does the tint level change?

A: An average-sized pane of SageGlass transitions across 90% of its dynamic range (from clear to tinted or from tinted to clear) in 7-12 minutes. The switching speed depends on a number of factors, including the ambient temperature and glass size: The warmer it is outside, the faster the glass transitions. Larger panes take longer than smaller panes to fully transition. Also, keep in mind that in day-to-day use the glass often changes in smaller increments (e.g., from one intermediate state to the next lighter or darker state) rather than from fully clear to fully tinted, so the transition takes less time.

Q: How does the cost of SageGlass compare with low-e insulated glass?

A: Total cost of ownership for SageGlass is generally equivalent or lower because in most installations, we eliminate the need for shading systems and the many associated costs. SageGlass also helps you reduce your energy costs (meaning smaller HVAC systems running less often). So while we may cost more when you compare us on a glass-to-glass basis, you're looking at apples versus oranges.

The most important thing is the people factor. We don't know how to quantify the many benefits of preserving the view and connection to the outdoors — which is the reason we put glass in buildings in the first place.

Q: Has SageGlass technology been independently tested? How durable is it?

A: SageGlass technology has undergone rigorous performance and durability testing by independent third parties, including the U.S. Department of Energy (DOE) and leaders in the glass fabricating and OEM skylight industry. SageGlass IGUs were the first products to pass the ASTM E-2141-06 (Standard Test Methods for Assessing the Durability of Absorptive Electrochromic Coatings on Sealed Insulating Glass Units). In fact, SageGlass technology survived over 100,000 cycles of accelerated environmental durability testing. That's twice the test standard and equivalent to switching a window nine times per day for 365 days/year over a 30-year lifetime, according to the DOE's National Renewable Energy Laboratory.