



DEVIL'S DETAIL

INTRODUCTION

Electrochromic glass is a type of “smart glass” capable of altering its light transmittance and solar heat through the application of a small voltage. Saint-Gobain pioneered the world’s smartest dynamic glass with the development of SageGlass®. Electronically tintable SageGlass tints or clears automatically to optimize daylight levels while preventing heat and glare without the need for blinds or shades. SageGlass delivers superior comfort, enhances occupant well-being, and saves energy while preserving views. Part of Saint-Gobain, SageGlass is backed by more than 350 years of building science expertise. There have been 1,000+ installations of SageGlass in 27+ countries around the globe.



Left to right: SageGlass, SageGlass LightZone, SageGlass Harmony (all images © SageGlass)

DYNAMIC GLAZING PORTFOLIO

The SageGlass dynamic glazing portfolio includes the following:

SageGlass®

Augments personal comfort through intelligent management of daylight, heat, and glare while maintaining a connection to the outdoors that is not possible with traditional solar control solutions.

SageGlass LightZone®

Provides precise control of daylight, heat, and glare; enhances interior color rendering; augments personal comfort; and maintains a connection to the outdoors that is not possible with traditional solar control options.

SageGlass Harmony™

A unique glazing solution that provides precise daylight, heat, and glare management for optimum comfort while maintaining the most natural connection to the outdoors.



WHAT'S DIFFERENT?

The Glazing Contractor's Perspective

AGI member contractor National Glass & Metal Co., Inc. of Horsham Valley, Pa., has worked on three separate projects with SageGlass products, all for Children's Hospital of Philadelphia (CHOP). Senior Project Manager John Norwood brought 25 years of glazing experience to his leadership of all three projects. The glaziers working for National Glass & Metal required no additional training to install the product, but Norwood and others in management worked closely with SageGlass to understand installation. "They provided very detailed instructions and were very responsive to questions and any issues," Norwood explained.

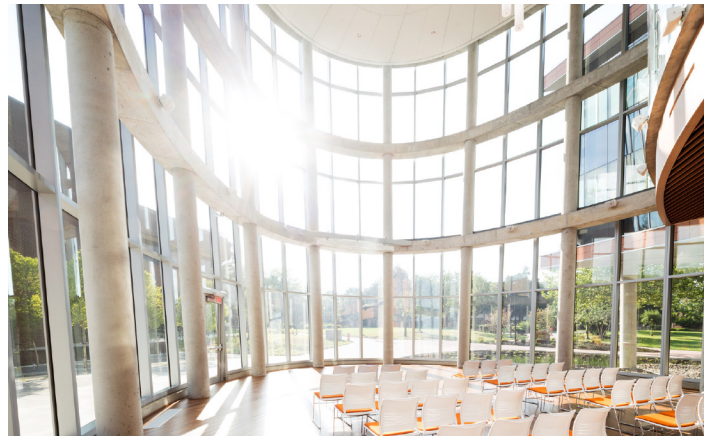
Accommodating the product's electrical wire, carefully sizing glass, and ensuring watertight integrity of the glazing system are all concerns. Norwood cautioned there is a necessary design phase related to the electrical components of SageGlass, and that glazing contractors and design professionals alike should be prepared for additional coordination with the electrical subcontractor. This design phase will identify placement of electrical wires in the glazing system, where switches will be located, and how the wires run from the glass, through the curtainwall framing, and into the building – all of which must be carefully considered.

"Architects must be very conscious of the framing system they are using to be sure there's enough room to run the electrical wire while having proper clearance between the frame and edge of the glass in order to hide the band," Norwood explained.

He added the SageGlass product team has been very good about providing details to ensure the wire whip is placed correctly on the unit. In fact, SageGlass will provide a project-specific wiring diagram once final glass sizes are identified, indicating precise lengths and locations for each wire. Norwood's experience with SageGlass has been positive, and National Glass & Metal will soon begin a fourth project at CHOP using the product.

COLLABORATION IS KEY

SageGlass offer owners and architects the ability to incorporate innovation into design and construction. Glazing contractors can contribute to that spirit of innovation by advising on issues of constructability and concerns in the field. AGI advises getting a glazing contractor involved in discussions early so that the entire team – and project – benefit from multi-disciplinary collaboration. Norwood said his team participated in informal design-assist for each of the three completed CHOP projects, collaborating with SageGlass representatives, the architect, and the electrical subcontractor, a process he described as helpful for all involved.



Traditional glazing with oppressive glare and heat gain.

WHY SAGEGLASS?

The Owner's Perspective

In a paper¹ presented at GlassCon Global 2018, a team from CHOP and SageGlass revealed its case for dynamic glazing in pediatric patient rooms. To evaluate the merits of dynamic glazing, CHOP performed a pilot test of SageGlass installed in patient rooms to determine if dynamic glazing "contributed to improved thermal and visual comfort and improved patient/family sense of control over their environment." Qualitative comfort surveys, observational conditions data, and radiant heat load data provided results.

CHOP staff and patients responded positively to the use of SageGlass, with 62 percent responding that environmental changes improved in the rooms with dynamic glass, and 85 percent revealing 'just right' or 'good' temperatures. The use of SageGlass also increased the amount of time patient room blinds were left open from 14 to 45 percent, providing additional daylight and views.

According to the paper, "Dynamic glazing provides an improvement in thermal and visual comfort and the general patient room environment as well as gives control to the patient/families over their environment . . . From the conditions data and from industry daylight and health studies, a correlation may be made that dynamic glazing in patient rooms may improve clinical outcomes for patients."

Read the complete paper online at: http://glassconglobal.com/proceedings-book-2018/gcg18_e-proceedings_book.pdf.

¹ Kiernan, J., Alcaraz, M., D'Annibale, S., Carney, D.E., McCarthy, R., Hynes, P., Creager, M. "A Case for Dynamic Glazing in Pediatric Patient Rooms," *GlassCon Global Conference Proceedings*. Chicago: September 5-7, 2018.



Dynamic SageGlass with the ability to change tint automatically.

SUSTAINABILITY

Sustainable buildings need to meet a number of requirements in order to be credentialed, but energy savings appears near the top of the lists. Dynamic glass can reduce building energy costs by 20 percent or more. Green labeling and certification programs such as LEED®, WELL, and BREEAM also provide credit for additional features and benefits supported by dynamic glass, such as daylight and access to outdoor views.

Sustainability goals are made more achievable by the use of dynamic glass - without the need to reduce or eliminate glazing. All SageGlass products enable more glass when modeling suggests reducing glass to meet energy code.

LEED POINTS WITH SAGEGLASS

SageGlass contributes to many of the requirements of LEEDv4 while offering benefits such the ability to optimize daylight, reduce glare, and manage heat – all while maintaining unobstructed views of the outdoors. Potential LEED v4 point total by using SageGlass averages 22-27 points

Potential LEED Points Per Category:

- Integrative Process (1)
- Optimize Energy Performance (3-8)
- Building Life-Cycle Impact Reduction (5)
- Building Product Disclosure & Optimization (2)
- Demand Response (2)
- Thermal Comfort (1)
- Daylight (3)
- Innovation (5)

Read the SageGlass [LEEDv4 Overview](#) for more details.



CASE STUDY: SCHEELS

Outdoor retailer SCHEELS has 27 stores in 12 states. Five recent stores incorporate SageGlass. The company and its architecture firm R.L. Engebretson use abundant glass to connect shoppers with the outdoors. However, at certain times of the day and year, excess glazing makes some stores too bright.

For the Johnstown, Colorado, megastore of 250,000 square feet, the company investigated numerous options to balance ample light with protection from heat gain and glare. Motorized shades didn't have the functionality they wanted, and it was cumbersome and costly to add a mechanical element that wasn't needed at all times. The design team decided dynamic SageGlass would be the best solution. The product comprises almost every piece of exterior glass on the building, including a grand atrium, large skylight, curtain walls, clerestories, and an east-facing employee break room. It is one of the largest installations of SageGlass in the U.S.

SCHEELS reported 73 percent less energy consumption and over \$487K in savings compared to other stores of similar size with traditional glass. The positive experience motivated SCHEELS to use the product on four additional stores, with over 20,000 square feet of SageGlass on vertical, horizontal, and sloped glazing.

Want to learn more about the SCHEELS experience? Read the [SCHEELS Project Case Study](#) and the data driven [SCHEELS Energy Savings Study](#).

WELL POINTS WITH SAGEGLASS

The WELL rating system specifically mentions dynamic glass as one of the two forms of dynamic facade to earn the daylighting/views credit (motorized blinds are the other).

SageGlass can contribute to a number of concepts within these four WELL categories:

- Air
- Light
- Comfort
- Mind

Within the WELL rating system, SageGlass provides the biggest impact to Circadian Lighting Design, Right to Light, Daylight Modeling, and Daylight Fenestration, all of which fall into the Light category.

Read the [SageGlass WELLv1 Overview](#) for more specific details.



DESIGN ASSIST SERVICES

SageGlass offers design assist services that can provide customers critical insights on their projects and how electrochromic glass can improve performance or support sustainability objectives.

SageGlass also has proprietary capabilities that integrate electrochromic glass into software tools such as Diva-for-Rhino, Grasshopper, and Radiance. The company is one of the few in the world that can use UC Berkley's Advanced Thermal Comfort model to simulate the thermal comfort impact of electrochromic glass.

SageGlass design assist services include:

- Single-location glare
- Comprehensive glare
- Daylight
- Energy
- Thermal comfort
- Visualizations and renderings
- Life-cycle cost analyses

Read more about [SageGlass Modeling Services](#).

Special thanks to Matthew Cleary, Territory Manager- Northeast for SageGlass and Saint-Gobain for information contained in this Devil's Detail. For additional product-related information, visit: www.sageglass.com or <https://www.saint-gobain-northamerica.com/living-laboratory/>.

Or contact matt.cleary@sageglass.com or (215) 840-9940.

About the Devil's Details

The AGI educational series illustrates and describes common glazing challenges as a means to communicate best practices for the design and construction industry, not as a sole source for design guidance. AGI recommends design professionals consult with an AGI contractor regarding specific project challenges. AGI contractor profiles may be accessed at www.theagi.org. To share a devilish detail of your own, contact info@theagi.org.