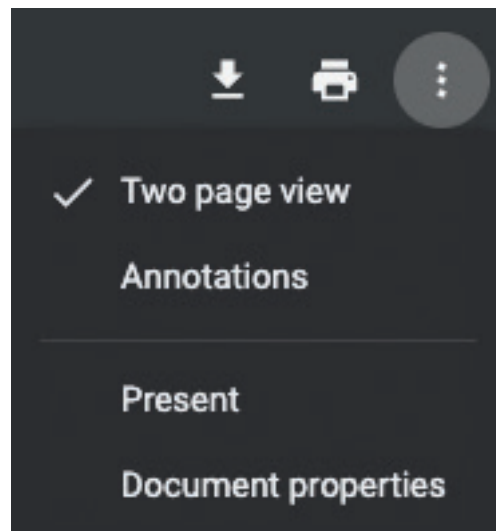


## Welcome to the digital edition of Glass Magazine!

To view the issue in a two-page format using Google Chrome,  
click the triple dots in the upper right corner and select  
“Two-page view” from the drop-down menu.





# GLASS

MAGAZINE®

THE GLASS AND GLAZING AUTHORITY  
MARCH 2024

GLASSMAGAZINE.COM

GUIDE FOR  
CAREER FAIRS

ANNUAL  
ARCHITECT'S  
GUIDE

NEXT-LEVEL  
CURTAIN WALL

## Recruiting Young Talent

GLASS COMPANIES AND  
SCHOOLS ARE JOINING  
FORCES FOR WORKFORCE  
DEVELOPMENT

OFFICIAL PUBLICATION

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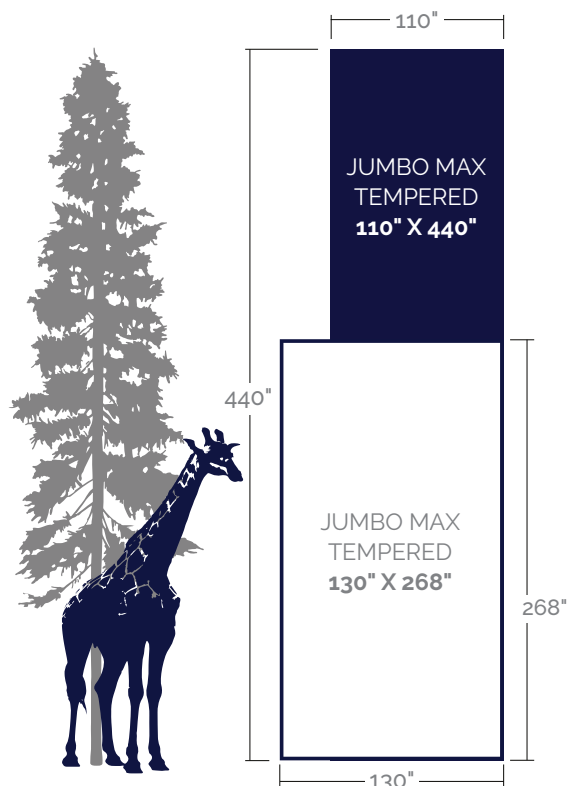
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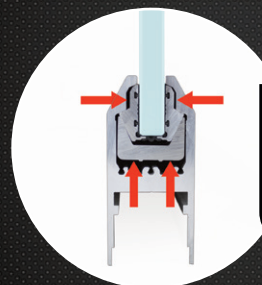
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The Moody Center on the University of Texas at Austin campus boasts a sweeping 360-degree curtainwall design featuring Solarban 70 glass from Vitro Architectural Glass. Photo by Tom Kessler.

56



## FEATURES

### 40. Recruiting Young Talent in the Glass Industry

Glass companies and schools are working together for workforce development

BY RACHEL VITELLO

### 48. Career Fairs Offer Recruitment Opportunities

High school career fairs are a great way for companies to talk with students about opportunities

BY TARA LUKASIK

### 56. Architect's Guide to Glass Sustainability

A closer look at embodied carbon, performance considerations, retrofits and recyclability

BY KATY DEVLIN

## INSIGHTS

### 26. Performance

Taking Aim at Sustainability with Commercial Vinyl

BY JOE ERB

### 30. Glazier Bulletin

Next-Level Curtain Wall Performance Solutions

BY STEPHEN AKI

### 34. Trendhunter

Considering Fenestration Finishes

BY TAMMY SCHROEDER

## DEPARTMENTS

8. Editor's Notes

10. From the NGA

14. Glass Informational Bulletin

16. News to Know

36. Q&A: Viracon

66. Product Solution: Roto North America

67. Industry Products

70. Suppliers Guide

84. Reader Response Center

86. Here's an Idea

**ON THE COVER:** Students and parents meet with companies across the construction industry to learn more about the opportunities that skilled trades can provide during the 2023 Trades Night event held at Ferris High School in Spokane, Washington. Photo by Tara Lukasik.





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Top Industry Metrics to Watch, on demand through the Thirsty Thursday series

## GLASSBLOG



### TECH ADOPTION

#### Reassessing 2023

By Chris Kammer, A+W Software North America



### LEGISLATION

#### Demystifying BABA

By Mary Avery, Tubelite

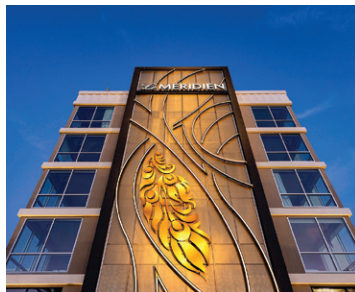


### FORECAST

#### ABI and Other Insights

By Max Perilstein, Sole Source Consultants

## PROJECT SHOWCASE



Featured in Glass Magazine Weekly and on [GlassMagazine.com](https://www.glassmagazine.com). To submit projects or case studies, write Norah Dick, [ndick@glass.org](mailto:ndick@glass.org). The four-star Le Méridien Pasadena Arcadia hotel in California combines modernist features with Art Deco elements in its design. The facade of the building incorporates Pulp Studio's Chromavision Gold glass elements that glow at night while reducing solar heat gain.

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## Tackling the Industry's Biggest Challenge: Labor



**KATY DEVLIN**  
Content Director  
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kdevlin@glass.org

Glass industry business owners have much to worry about today: economic uncertainty, inflation and interest rates, supply chain interruptions, and more, on top of any number of day-to-day concerns. However, one persistent challenge is only getting worse: labor.

The overall construction and manufacturing industries face a chronic shortage of labor. The construction industry will need half a million workers on top of the normal hiring rate to keep up with labor demand in 2024, and again in 2025, according to a model from the Associated Builders and Contractors. Manufacturing faces similar challenges. A study by Deloitte and the National Association of Manufacturing reports that the ongoing shortage of skilled labor could lead to 2.1 million unfilled jobs by 2030.

"We hear every year, in every survey and at every conference, that labor is the number one challenge for fabricators, glaziers and full-service glass companies. It is the biggest pain point for the glass industry," says Jenni Chase, vice president of workforce development for the National Glass Association, Glass Magazine's publisher.

To reflect this leading concern, the NGA revised its organizational goals to include Workforce Development, alongside the existing goals of Promote, Educate and Advocate.

"As the industry's association, it's our responsibility to help connect potential employees with glass companies," says Chase. However, the industry faces unique challenges. "Unlike the other trades, there is a lack of awareness among high school students and the public about what a glazier does. They know what an electrician does. They know what a plumber does. But not glaziers. We not only have to recruit people to the industry but we must educate them on what it is and the opportunities it offers."

Reaching high schoolers is a particular priority,

“

LABOR IS THE NUMBER ONE CHALLENGE FOR FABRICATORS, GLAZIERS AND FULL-SERVICE GLASS COMPANIES. IT IS THE BIGGEST PAIN POINT FOR THE GLASS INDUSTRY.

”

Chase says. "We talked to companies, and they have identified high school students as the primary target audience. They are open-minded and they have the biggest opportunity for a long-term career. They can become very valuable to the company and the industry for 30 years or more," she says.

But how do companies get in front of high school students? As part of its new workforce development initiative, NGA has developed a downloadable toolkit for companies: "A Guide to Recruiting at High School Career Fairs." The kit is also running, in full, in this edition of Glass Magazine on pages 48-55. This how-to guide is available in the NGA store, along with stickers and postcards designed to attract student attention to the trade. Additionally, hear how two industry companies are reaching high schoolers in the feature on pages 40-46.

The industry's labor shortage is widespread and daunting. It's up to all of us to spread the word that the glass industry is a place for fulfilling lifelong careers. ■



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## YOUR ASSOCIATION AT WORK

NEED-TO-KNOW INFORMATION  
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### NGA PLANS THIRD ANNUAL GLASS & GLAZING ADVOCACY DAYS

This year's Glass & Glazing Advocacy Days event will be held May 14-15 in Washington, D.C. Based on last year's success, the National Glass Association will again host members, stakeholders from government agencies and congressional members to discuss top policy priorities and to showcase how the industry contributes to the economy, the workforce and human health.

An opportunity to gain the attention of agency officials and congressional members, Glass & Glazing Advocacy Days

showcases industry businesses and the value of the U.S. architectural glass industry. NGA volunteers and staff will meet in organized small groups with members of Congress. Policy priorities at the 2024 event are energy efficiency/sustainability, bird-friendly glazing, school security and workforce development.

"Our members understand the value of glass and glazing to enhance spaces where we live, play, learn, work and heal. We host Glass & Glazing Advocacy Days to help our legislators understand that

value as well," says Nicole Harris, NGA president and CEO. "We look forward to hosting this event for the third year to capitalize on the momentum we've started, continuing to spread NGA's message about the solutions our industry provides." ■



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NGA and ASTM International co-published a comprehensive resource encompassing the most widely used and referenced standards developed for the glass and glazing

industry. The compilation is built for everyone in the building envelope industry to have one resource offering standard test methods, guides and specifications that govern the industry.

The content includes glass and glazing, building seals and sealants, environmental acoustics, fenestration products, plus two new standards for forced-entry resistant systems. ■

### UPDATED GTP ON HEAT-TREATED GLASS SURFACES



Download now

With the increase in the use of tempered and heat-strengthened glass to meet thermal and wind load design requirements, NGA volunteers have updated Glass Technical

Paper FB02-02 Heat-Treated Glass Surfaces are Different. The document discusses why industry cleaning procedures must be followed to avoid glass damage. It is available to download for free in the NGA Store. ■

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Research shows that windows providing natural daylight and a view to the outside benefit occupants.

- Schools—students score 7%-30% higher in math and reading and have lower absenteeism.
- Workplaces—20% increase in employee performance, 39 additional work hours per year, decreased sick days.
- Healthcare—22% less pain medication in post spinal surgery patients; reduced length of mental health hospital stays by 2.6 days.
- Economy—increased real estate values and rent.

## DYNAMIC GLAZING

The ability to modulate optical properties allows the building envelope to adapt to environmental conditions and improves occupant comfort and energy performance by capturing daylight while controlling glare and solar heat gain.





# The most-clicked news stories on GlassMagazine.com, brought to you by **GLASS MAGAZINE WEEKLY \***

## **Miter Brands to Acquire PGT Innovations**

Miter Brands will acquire PGT Innovations, according to a company release. The transaction will be financed in part by an equity investment from KochEquity Development LLC, the principal investment and acquisition arm of Koch Industries Inc., and a current investor in Miter.

PGTI also announced that it has ended its merger agreement with Masonite International Corp., originally announced in December 2023. This termination follows the Masonite board of directors' decision not to submit a revised offer to acquire PGTI, after being notified that the PGTI board had determined that a revised proposal from Miter Brands submitted on January 12 was a "superior proposal."

Miter's transaction with PGTI is expected to close by mid-year 2024, subject to PGTI shareholder approval, regulatory approval and customary closing conditions. The definitive merger agreement for Miter to acquire all outstanding shares of PGTI is at a price of \$42 per share in cash, or an enterprise value of approximately \$3.1 billion.

The purchase price represents a premium of 60% over PGTI's unaffected closing share price on Oct. 9, 2023, the last trading day prior to the public disclosure of a proposal for the acquisition of PGTI. The merger agreement has been unanimously approved by the boards of directors of both companies.

## **Pilkington UK Hosts Europe's First Carbon Capture Trial in Flat Glass Industry**

Pilkington United Kingdom Ltd., part of the NSG Group, announced the successful launch of Europe's first carbon capture trial in the flat glass industry, alongside partners C-Capture and Glass Futures. The carbon capture trial is successfully underway in St. Helens, UK, at Pilkington UK's glass manufacturing site, part of NSG Group.

Project success will see C-Capture and its project partners well placed for deployment of commercial-scale carbon capture facilities across the three industries by 2030, which could capture millions of tons of carbon dioxide per year.

## **Ironbridge Acquires Gardner Glass Products**

Ironbridge acquired a controlling interest in U.S.-based Gardner Glass Products. Ironbridge also acquired Walker Glass Co. in 2022.

Founded in 1962, Gardner Glass Products started as a mirror manufacturer. Over the years, Gardner expanded its product offering to include a variety of decorative glass products under its Dreamwalls brand. Today, Gardner Glass Products/Dreamwalls is a leading U.S. decorative glass and mirror manufacturer for commercial interiors. Gardner operates manufacturing facilities in North Carolina and Texas, and a distribution location in Indiana.

Although both companies will continue to operate as independent

entities, senior management in both organizations see growth opportunities under the Ironbridge umbrella.

## **Agnora Acquires West Coast Glass Products**

Agnora acquired West Coast Insulated Glass Products. West Coast Insulated Glass is a premium residential glass fabricator based in Cerritos, California.

With this move, Agnora welcomes new customers as it expands its market presence and aims to provide more innovative glass solutions. The combined expertise of Agnora and West Coast Insulated Glass Products aims to pave the way for expanded product offerings and improved service delivery, making it a one-stop-shop for whole-home solutions.

## **Guardian Glass Introduces Lower- Carbon Float Glass**

Guardian Glass introduced a lower-carbon float glass to the European market. The new float glass, Guardian Nexa, can also be used as a base glass or laminated glass for Guardian high-performance products, including the Guardian SunGuard and the Guardian ClimaGuard ranges of coated glass products.

Guardian Nexa glass can be used in a range of building facade applications to help reduce the embodied carbon of the built environment. When compared to Guardian's standard float glass production, the benefits of Guardian Nexa include reduced embodied carbon, higher cullet content from both internal and external sources, no compromise

A photograph of a modern hospital corridor. The walls are made of glass, revealing the interior of several rooms. Each room contains a hospital bed, medical equipment, and a blue accent wall. The corridor is brightly lit with circular ceiling lights. In the foreground, a light-colored wooden bench is visible. The text "Reimagine switchable glass." is overlaid in the bottom left corner.

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## NEWS TO KNOW

on performance and aesthetics, and environmental stewardship.

### CiTEX Holding GmbH Acquires Pixargus

CiTEX Holding GmbH acquired Pixargus GmbH, based in Würselen, Germany.

The technically specialized company has offered inline quality control for extrusion products for 20 years, using image processing technology to detect and document flaws and material changes as part of automated surface inspection and geometry measurement of profiles, hoses, pipes, cables and sheets made of plastic, metal, paper and fiber composites, primarily for medium-sized customers in Europe.

The acquisition hopes to underline CiTEX Holding's commitment to consolidating its position as a leading provider of sensor and measurement technology and advanced digitalization solutions worldwide, through its subsidiary iNOEX GmbH, and to distinguishing itself as a leading provider in the global plastics extrusion market.

### Glaston and Hegla Form Partnership in the Asia-Pacific Region

Glaston Group and Hegla entered into an exclusive partnership covering the majority of the Asia-Pacific region, with a goal of strengthening the offering of both companies for the benefit of customers. With the complementary product offering, both companies hope to meet glass fabricators' growing demand for automation and integration providing comprehensive solutions, faster response and services to customers thanks to the broader network in the region.

Hegla's sales and distribution activities in the area will draw upon the resources and network of Glaston Group. The partnership covers the whole region except for Japan, South Korea and China.

### Sisecam Finalizes Partnership Agreement with Icron

Sisecam Investment B.V., a wholly owned subsidiary of Sisecam, purchased shares



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in the Turkish technology company Icron.

Some 3% of Icron's total shares were purchased by Sisecam Investment B.V. for \$3 million. Simultaneously with the share purchase, it was also decided to increase Icron's total capital by \$5 million, with participation solely by Sisecam Investment B.V. As a result of this capital increase, Sisecam Investment

B.V.'s stake in Icron will rise to 15.66%.

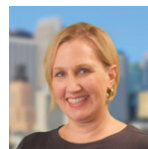
Sisecam's goal with this partnership, its first investment in software technologies, is to grow in tandem with Icron. Icron is expected to contribute to Sisecam's operational and financial performance with its already established digital infrastructure and its approach that meets today's evolving technological needs.

## Great Lakes Lifting and Glazier Nation Partner

Great Lakes Lifting and Glazier Nation will collaborate to provide comprehensive support to glazing contractors. The two companies will offer a combination of skilled labor, equipment and technical support, to revolutionize the way contractors tackle their projects.

Key highlights of the Great Lakes Lifting and Glazier Nation partnership include a unified source for skilled labor and quality glazing equipment, simplifying the contractor's procurement process, technical support and service from the experienced Great Lakes team to ensure equipment efficiency and safety, access to a wide range of specialized equipment tailored to the unique needs of glazing contractors, and a commitment to advancing the glazing industry by providing innovative solutions and expertise.

## PEOPLE



Koeckeritz

### Brin Glass Co.

appointed *Priscilla Koeckeritz* as president. This change follows Bill Sullivan's seven-year tenure as president and

CEO. Sullivan will continue to serve as CEO and chairman of Brin Glass Co. in 2024, with Koeckeritz slated to step into the CEO role within two years.

Koeckeritz joined Brin as chief operating officer in 2022 after serving as a fractional chief marketing officer since 2021. Prior to joining Brin, Koeckeritz spent 25 years in the Twin Cities business community working in start-ups and consulting with small businesses.

Koeckeritz's appointment marks a historic moment as the first female president in the company's 100-plus-year history and only the seventh president in the history of the Brin Glass family of companies.

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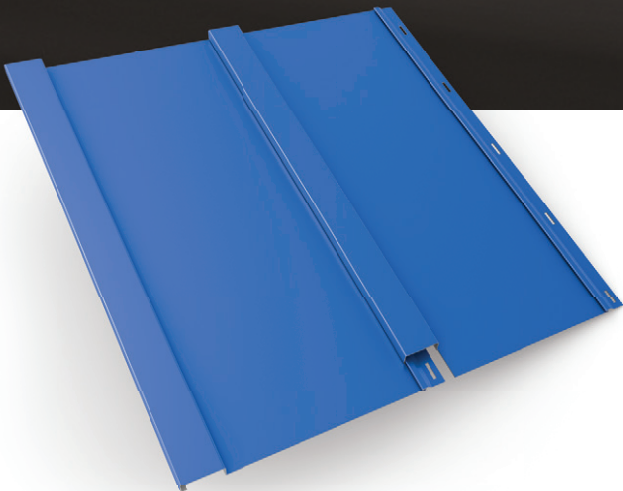
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Klein

**ODL Inc.** promoted *Dave Klein* to president and CEO.

Klein has been part of the ODL team for the past eight years, initially joining as chief operating officer. He was promoted to the role of president and COO in 2020. Throughout his tenure, Klein has exhibited an ability to build and lead high-performing teams, driving strategic initiatives that have contributed to the company's growth, according to officials.



Lamb

**Virginia Glass and Mirror**, headquartered in Martinsville, named *Larry Lamb* as the new president and CEO. Lamb will replace outgoing president and CEO John Korff, as he transitions to a new role on the board of directors for the companies.

Lamb previously served as vice president of manufacturing for LFFlex where he was responsible for plants in Louisville, Kentucky, and High Point, North Carolina. Previous to LFFlex, Lamb was a general manager at ProAmpac, overseeing operations at four manufacturing sites.



Zech

**Alpen High Performance Products** announced a new CEO, *Andrew Zech*, formerly the chief operating officer of Nuveen Green

Capital. Former CEO Brad Begin, who purchased the company in 2006, is transitioning to his role as chairman of the board.

Zech specializes in scaling high-growth companies, advises several sustainability-focused startup companies and currently sits on the board of Alpen HPP.



Donohue

*Morgan Donohue* was named the new owner of **Erdman Automation**.

Donohue has worked alongside Erdman for over 25 years from the very beginnings at the Erdman farm, to the 215,000-plus-square-foot facility in Princeton. He holds numerous patents for the machines Erdman produces. As Donohue is already the current president of Erdman Automaton, customers and partners can expect a seamless transition.



Faure

**Cyncly** announced the appointment of *Julien Faure* as its chief product officer. In his capacity as CPO, Faure will support Cyncly's product management, strategy and design efforts as the company continues to grow its customer base and solution portfolio.


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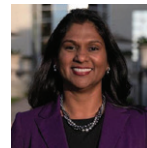
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Jokhu-Sowell

**Urmilla Jokhu-Sowell**, MSCE, PE, vice president of advocacy and technical services, **National Glass Association**, has

started her three-year term on the ASTM International board of directors.

As a vice president of NGA, Jokhu-Sowell is part of the largest trade organization of its kind in North America. She joined ASTM International in 2007, serves as the secretary for the glass and glass products committee (C14) and the second vice-chair for performance of buildings committee (Eo6) and is the subcommittee chair for C14.01 and Eo6.52.



Kuchinick

**Consolidated Glass Corp.** appointed **Chuck Kuchinick** as the new national sales manager of laminated glass products.

Kuchinick will be responsible for territory development through increased inclusion of CGC's laminated glass products in the emerging market. His presence hopes to help implement the expansion of CGC's laminated product portfolio, as well as service and support for existing customer accounts. Kuchinick has been in the glass fabrication industry for over 25 years.



Heymann

**Giroux Glass Inc.** promoted **Jeffrey Heymann** to vice president of sales and marketing.

Heymann started with Giroux in September 2023 as senior director of major projects. With over 35 years of experience in the exterior façade industry, Heymann brings a wealth of knowledge and expertise to this position. ■



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Let's celebrate the remarkable career of our esteemed Architectural Sales Manager, Barbara Russell, as she embarks on a new chapter following three decades of dedication to the Architectural Flat Glass industry.

Barbara has been a driving force behind our success at Glassfab, showcasing unmatched technical expertise, passion, and unwavering commitment to our customers and the industry at large. As we express our deepest appreciation for her accomplishments and invaluable leadership, we extend our warmest wishes for a fulfilling retirement journey ahead.

Here's to Barbara and her extraordinary contribution!





## PERFORMANCE

# TAKING AIM AT SUSTAINABILITY WITH COMMERCIAL VINYL

AS VINYL OPTIONS FOR COMMERCIAL GLASS AND GLAZING APPLICATIONS MATURE, THEY OFFER PERFORMANCE IN DEMANDING APPLICATIONS AND SUSTAINABILITY FOR ARCHITECTS  
BY JOE ERB



Architects are always tasked with balancing a range of different performance criteria when specifying materials and drawing up designs for new commercial structures. But in 2024 and beyond, there's one driver that may trump them all: sustainability.

There are a variety of reasons why. Building codes and standards continue to become more stringent when it comes to energy efficiency. Meanwhile, sustainable design choices are increasingly viewed as a simple social responsibility not unlike that of adequate fire protection or other essential components. And because 40% of energy in the United States is consumed by buildings, organizations like the American Institute of Architects are making strong commitments to reduce carbon dioxide emissions.

For architects, there are countless choices to be made when specifying materials for a new building, and all of them can contribute to the structure's overall sustainability profile. Those include, of course, choices about fenestration systems.

It's against this backdrop that commercial vinyl window systems have emerged as a reliable and more thermally efficient option when compared with many metallic systems. For punched opening applications, and even for some forward-thinking curtain wall applications, vinyl can bring elevated energy efficiency to an entire building—and in 2024, has proven itself to be 100% viable for the demands of commercial construction.

For architects looking to add another element to their arsenal of sustainable building options, it's worth investigating commercial vinyl options.

## Outstanding thermal efficiency for more sustainable buildings

Windows and fenestration are an essential component in any human-occupied structure. Be it professional or residential space, occupants require daylight and—where appropriate and when weather conditions are optimal—the option of free-flowing fresh air within the interior space.

That being said, heat that either escapes or enters through windows accounts for roughly 30% of the energy used to heat or cool that same building. That's a significant loss of energy, but the right window technologies can help drive that figure down significantly.

Vinyl and composite options offer opportunity here. The right designs can dramatically improve energy efficiency, structural performance and condensation resistance versus energy-challenged, metal-based frames and components that



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lose energy. There are ancillary benefits too, as these options have the potential to reduce sound transmission, helping to create quieter and more comfortable living and working spaces, especially in busy urban environments.

Paired with proven technology like high-performance, warm-edge spacer systems—which have demonstrated their ability to deliver efficiency gains in some of the most demanding applications in the world—architects can make a real impact with commercial vinyl in a variety of applications.

#### Long-term performance

It's important to remember that sustainability is about more than immediate-term efficiency gains. The entire life cycle of chosen components should be evaluated when specifying for sustainability. To wit, here's a quote from a recent AIA practice guide, "Design for Adaptability, Deconstruction, & Reuse":

*For all the heavy lifting a new building requires, our structures are often torn down before they reach the end of their useful life. It doesn't have to be this way. By being more intentional about the flexibility of a structure, buildings can hold neighborhoods together, encourage social equity, and contribute to community resilience for extended periods of time.*

For these reasons, it's increasingly important to consider the long-term durability and longevity of any building component. Because even if your window systems may deliver efficiency gains, those can easily be cancelled out in terms of overall environmental impact if those systems fail in the short term; they'll just end up in a landfill that much sooner.

When evaluating vinyl or composite options, consult with your suppliers and partners on how their systems with-

stand the test of time. For example, do they meet the right weathering requirements for trustworthy performance in wide-ranging North American climates? Do they demonstrate the necessary structural characteristics to match the expected performance of a comparable metallic option? And if you're opting for nonstandard color options, will those technologies provide long-lasting vividness and weather resistance?

As sustainability becomes ever more important in the architectural and commercial construction spaces, these are some of the things that are worth thinking over. Vinyl and composite technologies are here to stay in the commercial world—immediate efficiency and thermal performance gains must be matched by anticipated longevity for a true, sustainable solution. ■

Joe Erb is national account manager for Quanex Building Products.

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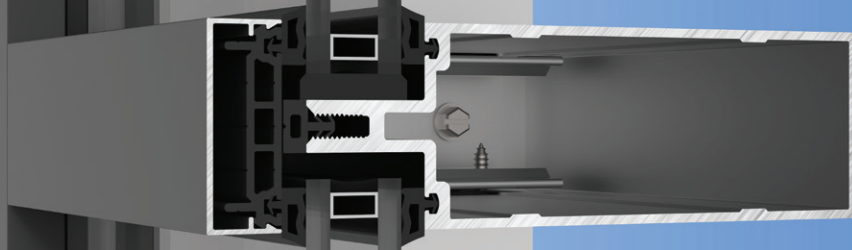
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**ABOVE:** Outside glazed pressure wall system with polyamide pressure plates. Photo by YKK AP America. **LEFT:** Toronto's Harris Square mixed-use high-rise project earned LEED Gold and used a polyamide insulation profile in the fenestration system to meet high thermal performance criteria. Photo by Quest Window Systems

## NEXT-LEVEL CURTAIN WALL PERFORMANCE SOLUTIONS

HIGH-PERFORMANCE FENESTRATION SYSTEMS INCLUDE LOW-CONDUCTIVITY PRESSURE PLATE SYSTEMS TO HELP MEET ENERGY CODE NEEDS

BY STEPHEN AKI



Fenestration products play an important role in commercial buildings, beyond providing good aesthetics. Daylighting, thermal comfort and air infiltration can be positively impacted by high-quality, high-performance curtain wall systems.

However, poor system performance can reduce thermal comfort and increase the costs to cool or heat a building by transferring all energy directly to the inside or outside, depending on the season.

Commercial building codes are continuing their progress toward increasing the thermal efficiency of the façade. Additionally, the International Energy Conservation Code and ASHRAE 90.1 Energy Standard for Sites and Buildings are now pushing to achieve net-zero energy by 2030-31. Building codes constantly lower the prescriptive values for fenestration U-factor with the 2024 IECC lowering U-factor for fixed fenestration to 0.25 British thermal unit per hour per square foot per degree Fahrenheit (Btu/hr\*ft<sup>2</sup>\*°F) in climate zone 8, 0.34 Btu/hr\*ft<sup>2</sup>\*°F in zones 4 and 5, and 0.38 Btu/hr\*ft<sup>2</sup>\*°F in zone 3.



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Lower prescriptive U-factors encourage fenestration manufacturers to explore new solutions that can give them a competitive edge and increase system performance. Traditionally, manufacturers incorporated high-performance glass technology to meet stringent energy requirements, but glass changes can be expensive. Moving from a double-pane system to a triple-glazed increases the costs and complexity of a system. Glass is also only one part of the entire system, and a simple change to the frame could help elevate a poor or mediocre performing product into a high-performance system.

Typical curtain wall systems utilize aluminum pressure plates, which have a very high thermal conductance and can affect condensation values. Replacing aluminum pressure plates with polyamide pressure plates can greatly increase the performance of a system as polyamide is 500 times more

insulating than aluminum. Additionally, polyamide pressure plates can increase condensation resistance, which allows for higher humidity levels and more comfort in buildings. Some tested products have achieved approximately 24% better U-factor and 20% higher condensation resistance values when replacing aluminum pressure plates with polyamide pressure plates.

Fiberglass pressure plates also offer an alternative material to help increase thermal performance of a system. Fiberglass offers rigid products with tight tolerances and can be swapped with little change to original system. Custom fiberglass pressure plate shapes also can be created to fit a specific system requirement. However, fiberglass profiles can be more difficult to machine and fabricate because special saws and ventilators to ensure manufacturers do not have negative reactions to the cut fiber typically are required. In con-

trast, polyamide pressure plates do not require any special fabrication or safety equipment for processing and custom shapes are available.

High-performance fenestration systems can be achieved utilizing a variety of verified materials, glass and spacers to help manufacturers meet the energy code needs of tomorrow. ■

Stephen Aki works for Technoform North America, helping designers develop sustainable, energy-efficient, high-performance systems. He can be reached at [stephen.aki@technoform.com](mailto:stephen.aki@technoform.com) or 971/832-0502.

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## CONSIDERING FENESTRATION FINISHES

DESIGN-DRIVEN, HIGH-PERFORMANCE PAINT AND COATING SOLUTIONS FOR ALUMINUM ARCHITECTURAL PRODUCTS **BY TAMMY SCHROEDER**



**W**hen considering finishes for fenestration and architectural building products, many architects start by selecting a color to convey the desired appearance for their client's building projects. High-performance paint and coating solutions offer the greatest aesthetic flexibility along with proven durability and a long service life.

### Color considerations

Current architectural color trends include calming, comfortable, cozy shades intended to soothe and inspire a sense of peace and well-being. These warmer, less saturated hues lean toward blue-gray, golden beige and peachy pink complemented by earthy browns tinged with red and purple. Specialty architectural coatings can further enhance the visual and tactile effects of the finished appearance, such as textured terra cotta and wood grain painted finishes.

To achieve the chosen finish color, architects use the assigned paint code provided by either the coatings system manufacturer or the finishing applicator. When color is critical, architects review a physical sample to confirm client approval.

The same color can look different in changing light or when placed next to other colors and materials. With fenestration, the glass selection will have the most influence on how the framing members' finish is perceived. Architects should pair these samples together for optimal results. Exterior surfaces of finished fenestration are best reviewed outdoors under natural light and the finished interior surfaces are best reviewed indoors using a combination of natural and electrical illumination.

### Paint performance

Extruded aluminum framing is the most specified material for fenestration assemblies on commercial buildings. For more than 50 years, polyvinylidene fluoride, or PVDF, resin systems have demonstrated consistent, reliable performance for aluminum-framed fenestration.

The advantages of these high-performance aluminum coatings are:

- Vast array of color choices
- Fast and cost-effective for small-batch and custom colors
- Color and gloss retention (UV resistance)
- Resistance to abrasion, humidity, salt spray, chalking and chemicals
- Structural integrity of the

aluminum is protected and maintained

- Field touch-up and repainting capabilities

The Fenestration and Glazing Industry Alliance publishes three industry standard specifications for architectural coatings on aluminum extrusions. Finishes that are manufactured and applied to meet AAMA 2605-22, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) provide the highest performance. Finishes that meet AAMA 2605 include 70% PVDF resin-based coatings, which deliver durability and longevity. The rigorous testing of these coatings includes more than 4,000 hours of accelerated exposure to salt spray.

### Specification simplified

Sometimes, a paint manufacturer's brand name is mistaken for a specification. For example, Kynar and Kynar 500 are registered trademarked brands of Arkema. Other examples include:

- AkzoNobel—Trinar
- PPG—Duranar
- Sherwin-Williams—Fluoropon
- Solvay/Syensqo—Hylar

To ensure the highest performance architectural coatings for aluminum fenestration and other building products, specify 70% PVDF resin-based coatings that meet AAMA 2605. ■

---

Tammy Schroeder is the director of marketing for Linetec, Tubelite and Alumicor brands. With more than 20 years of experience in the finishing industry, she serves as an industry educator on high-quality, high-performance architectural products, finishing and services. She can be reached at [tammy.schroeder@apog.com](mailto:tammy.schroeder@apog.com).

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## AT THE FOREFRONT OF TRANSFORMATIVE SOLUTIONS

CREATIVE THINKING, ADOPTION OF INNOVATIVE TECHNOLOGIES AND PROCESSES, AND A COMMITMENT TO QUALITY AND SUSTAINABILITY SET VIRACON APART AND POSITION IT FOR LONG-TERM SUCCESS **BY TARA LUKASIK**

**F**rom the Sphere in Las Vegas and the Rainier Square Tower in Washington to the Mercedes-Benz Stadium in Atlanta and One World Trade Center in New York, Viracon glass and products can be found in some of the most beautiful and iconic structures. Maintaining a competitive edge in the glass fabrication industry requires a combination of creative thinking and the adoption of innovative technologies and processes. This not only sets a company apart from competitors but also positions it for long-term success in a dynamic market.

Throughout its 50-plus-year history, Viracon has developed and introduced industry-leading technologies that deliver a diverse range of aesthetic and performance options for building owners and architects as they design their distinctive buildings. Viracon continuously develops value-added insulating glass features along with high-performance architectural glass coatings. In 2021, it introduced Viracon PLUS™, a strategic partnership program designed to foster innovative architectural glass technology and bring those new technologies to market faster. Last year, it unveiled a first-of-its-kind glass Viracon Identification Number system for insulating glass units.

I recently sat down with Garret Henson, vice president of sales and marketing, and Jessi Mages, strategic product sales manager, to discuss Viracon's approach to distinguishing themselves in the industry through innovative technology, extensive customization options, and a commitment to quality and sustainability.

**How has Viracon evolved over the years, and what sets it apart from other glass fabricators?**

**Garret Henson:** Viracon's selection of innovative architectural glazing options, combined with technical expertise and dependable service levels, differentiate us from other glass fabricators. From aesthetics to strict environmental and energy specifications, to critical budget and delivery requirements, our input

makes a difference and helps make our clients' visions a reality.

### **How does Viracon position itself in the market compared to other glass fabricators?**

**GH:** We distinguish ourselves in the industry through innovative technology, extensive customization options, and a commitment to quality and sustainability. We invest in state-of-the-art manufacturing processes and technologies to produce high-performance glass products with precision and efficiency. We understand the diverse needs of architects and builders and offer a range of customization options, including various coatings, print patterns and insulating glass compositions so clients can tailor our products to their specific project requirements.

We also incorporate sustainable practices into our manufacturing processes wherever possible, aligning with the growing demand for eco-friendly building materials and presenting an attractive choice for environmentally conscious projects.

### **With your focus on sustainability, do you have any plans to expand into solar?**

**Jessi Mages:** Yes, solar is coming! With in our Viracon PLUS™ product family, we focus on the voice of our customers, upcoming legislation and niche issues. The process to become a partner inside this segment is stringent and takes time as we search for the best solutions and partners to bring products to market.

### **In line with forecasts, are you seeing a surge in demand for safety and security-oriented glass solutions from your customers?**

**JM:** Demand is on the rise, and our products can meet codes from hurricane to forced entry/ballistic resistant, to cyber security and beyond. Specifically, our CyberShield® with Pilkington

DataStop™ product is engineered to reduce the transmission of radio frequency electromagnetic radiation to prevent eavesdropping.

### **Are we finally going to start seeing electrochromic glass in more projects?**

**JM:** Yes, smart glass has been getting a lot of attention lately. It has taken 20-plus years for smart glass to commercialize. Our partnership with Halio is entering its third year and allows us to directly source the electrochromic device and then laminate it into a glass unit. Both companies do what they do best, which minimizes risk in the market and offers the best smart glass option. And the Inflation Reduction Act, specifically the Investment Tax Credit, is helping drive additional consideration from our customers and developers for smart glass.

### **In the trend toward larger, oversized glass, what measures or investments have you undertaken?**

**GH:** Larger format IGUs have become part of our daily vernacular. Our project cycle time is traditionally longer than most, which can give us a head start on emerging large glass trends and allow us to make early investments within our manufacturing operations and client services capabilities to make sure we are ready to meet customer's oversized glass needs.

### **What future glass fabrication trends or developments can we expect?**

**GH:** The glass industry will see continued advancements in technology, including glazing solutions that can enhance protection, amplify R values, create energy and further natural light optimization. And as sustainability becomes a more critical factor in construction and design, glass fabricators are expected to focus on eco-friendly practices and materials.

### **Launching and scaling new technologies within the commercial architectural space is difficult and loaded with challenges. How does Viracon establish confidence in, and de-risk their customers from, emerging technologies?**

**GH:** Through multiple strategies. Before introducing new technologies or products, Viracon conducts extensive testing and validation to ensure that they meet industry standards, comply with regulations and perform reliably. Ensuring that new technologies comply with industry standards and regulations is a fundamental de-risking strategy.

Viracon also collaborates with key clients on case studies before a widespread technology launch, allowing us to gather feedback, identify potential challenges and make necessary adjustments. Viracon's collaborative partnerships with industry experts and technology providers offer additional expertise, resources and validation.

Providing flexible implementation options allows our customers to adopt new technologies gradually or customize solutions based on their specific needs, reducing the perceived risk associated with large-scale technological changes.

And finally, providing a clear, long-term roadmap for future technology development reassures customers of our commitment to ongoing innovation and support. Sharing our long-term vision helps our customers understand how emerging technologies will evolve and remain relevant over time.

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# RECRUITING

# YOUNG TALE

# IN THE

# GLASS

# INDUSTRY

OUTDOOR EQUIPMENT ON DISPLAY AT A RECENT TRADES NIGHT EVENT HOSTED BY THE ASSOCIATED BUILDERS AND CONTRACTORS—INLAND PACIFIC CHAPTER. TRADES NIGHT PHOTOS BY RICHARD CHAN | RIVER ROCK IMAGES, COURTESY OF ABC—IPC.

HOW GLASS COMPANIES AND  
SCHOOLS ARE WORKING TOGETHER  
FOR WORKFORCE DEVELOPMENT

NT



BY RACHEL VITELLO  
ADDITIONAL REPORTING  
FROM TARA LUKASIK

W

orkforce development, including recruiting and retaining young people, is increasingly important to the glass, construction and manufacturing industries as finding and keeping labor continues to be a top challenge for companies. In 2024, the construction industry as a whole will need to bring in an estimated 501,000 new workers on top of normal hiring to meet industry demand, according to data from the Associated Builders and Contractors.

Recruiting the next generation requires individual companies—and entire industries—to reach future workers directly. Career fairs at schools or organizing facility tours with students are two ways to engage with students and discuss a career in the trades with them.

In Washington state, two organizations are working to connect with next generation workers through events targeted toward students interested in learning more about this career path.

This article will explore two separate events. The ABC Inland Pacific Chapter held a Trades Night event in October 2023 in Washington, which was a career fair for students and their families interested in working in the trades. Likewise, NGA member company Allegion/TGP hosted a tour of its facility in Washington for high school students and their teachers as part of Manufacturing Day to show them what a day in the life of the trades looks like.





# TRADES NIGHT

In an effort to introduce skilled trades to students in elementary, middle and high school, the ABC IPC Trades Night event, held Oct. 12, 2023, at Ferris High School in Spokane, Washington, brought together more than 40 employers, educators and training partners to offer students and parents a look at construction trades-related jobs and opportunities.

This event, which was held in conjunction with the local business community and the Spokane School District, was an opportunity to show students of all ages and backgrounds that manufacturing and construction industries have many opportunities for a fulfilling career, stable pay and a work-life balance, among the many other positives of those industries.

Sarah Cottam, president and CEO of ABC IPC, says that participating in events like Trades Night can be a great way for companies to interact with the up-and-coming workforce.

“You get back what you put in. The more interactive your hands-on component is and the more involved you are with attendees the better the experience will be for everyone,” says Cottam. “People want to learn and a lot of the children within our community are unaware of the options they have for their future. You could be their future; make sure it shines.”

To ensure your company has a successful experience at a career fair, Cottam says it helps to display and demonstrate the equipment your company uses, like physically drive a roller, operate a crane or spray insulation foam. For indoor vendors, demonstrations like installing a window, using casting kits from a concrete company, or drilling things together with some type of prize for their hard work is a great way to get the students involved and interested. Cottam says “the options are endless, and so is the fun.”



**LEFT:** A STUDENT VISITS A TABLE AT TRADES NIGHT IN SPOKANE. **RIGHT:** A STUDENT LEARNS HOW TO SPRAY INSULATION FOAM AT TRADES NIGHT.

AllStar Glass Vice President Jodi Martinez is also on the workforce development committee for ABC IPC. Martinez says companies interested in participating in a career fair should attend one or two events first, just to observe, then volunteer. This will help you make sure the event is something you want to be associated with. While there, get a feel for the audience and the organization of the event, visit other company vendors and get ideas of good displays and bad displays. Ask for help and/or advice from other companies and organizations who have participated in these events. Martinez says that showing up is half the battle, so being prepared for it in advance will help with your success as a vendor.

“Consider participating in these events even if you are not currently hiring at your company. We should all be actively recruiting for future glaziers no matter what company they work for. We need to promote how awesome our beloved glass and

glazing industry is and events like Trades Night are the ideal place to do that,” says Martinez. “The outreach, connecting and ‘planting glass seeds’ happens organically once you are there at the event, in the classroom, attending the meeting, or volunteering for committees. You have to start somewhere right? Start small, but start.”

From the school’s perspective, Ferris High School Principal Andrew Lewis says career fairs help students see that pursuing the trades is a career choice, rather than something you do if you have no other options. These events help students see that people in the trades are professionals and very skilled.

“Ferris strongly believes that our students are best equipped to choose a pathway that fits their skills and interests when they are informed of many options. So, we work to inform our students of as many options as possible. Trades Night helps students see the many diverse opportunities in the trades fields,” says Lewis.

Lewis adds that students who express interest in the trades are often made aware of Ferris High’s Career and Technical Education programs both in-building and at the NewTech Skills Center with which Ferris partners. At the Skills Center, students can get an early start on building skills and working toward certifications while in high school.

“Expect to talk a lot and to teach ages from three to 30 about your trade and company. With it being held on a workday and mid-week, we all have to go to work in the morning, so expect to be tired, your feet will hurt and the next day is a sluggish start,” Cottam says. “But with that said, know that being an active part of raising awareness of the trades as well as showing our community that success looks different for everyone is so fulfilling. I promise it is well worth it.”





MOUNT SI HIGH SCHOOL STUDENTS TOUR TGP'S FACILITY.  
PHOTO COURTESY OF TGP.

## MANUFACTURING DAY

On Oct. 11, 2023, as part of MFG Day, Allegion/TGP hosted a tour of its facility for Mount Si High School students and their teachers in Snoqualmie, Washington. The Manufacturing Institute, an affiliate of the National Association of Manufacturers, organizes MFG Day, which aims to shine a spotlight on modern manufacturing careers by encouraging companies to host events for students, parents and teachers. Twenty-two students attended Allegion/TGP's event to get an inside look into a manufacturing facility.

Devin Bowman is Allegion/TGP's general manager and has been organizing TGP's MFG Day events for five years. He says participating in events like MFG Day is a very important way to give back to the community by providing an opportunity for

students to learn about different employment opportunities available to them post-graduation. It is also helpful because, as a company, you can benefit by attracting future team members who add value to your business and culture.

"I think those who participate in a Manufacturing Day event for the first time will be pleasantly surprised at how easy it is to host the event and that it is actually a lot of fun. The students who choose to participate are genuinely interested in learning about the opportunities at the business they visit. This is evident by the level of engagement demonstrated through thoughtful questions and active participation throughout the event," says Bowman.

"In regards to challenges, during the pandemic, we continued to host the event virtually, which





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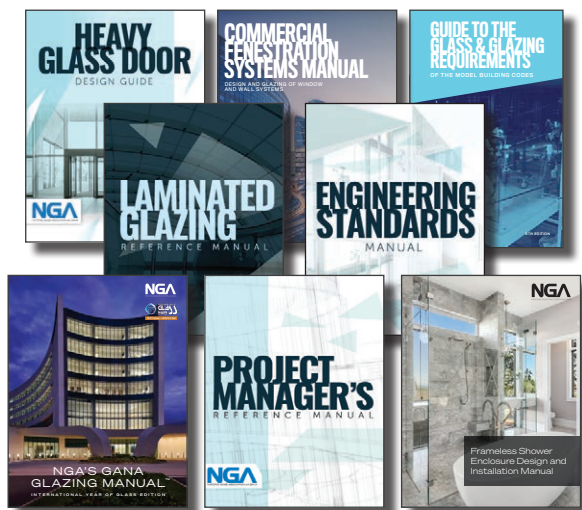


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while it was better than nothing, it did not provide the students the ability to walk through the production floor and view the products being produced first hand. Aside from that, the school administrators we work with to coordinate the event are extremely helpful and make the process easy.”

However, Bowman adds that organizing events of this nature does take a lot of time to put together due to conflicting schedules, so early planning is essential. Bowman typically starts planning in the summer, but waits to actually reach out to schools until school is in session. He also says that companies should not be discouraged if they don't hear back from school districts their first year participating, as it can take years to cultivate those relationships.

Hope Todd was a senior at Mount Si High School during another MFG Day tour of Allegion/TGP's facility in 2019. Now, she is an assembly team lead for the company.

“Attending MFG Day at TGP was a new experience for me. It was my senior year and I was still figuring out what I wanted to do as a career. When we arrived, we had some guest speakers from TGP that spoke about their careers here; they ranged from engineers, programmers, to supervisors and more,” says Todd. “Those individuals talked about how they got into the position and some of their work background. That showed us everyone takes different paths to careers. My path at TGP started that very day.”

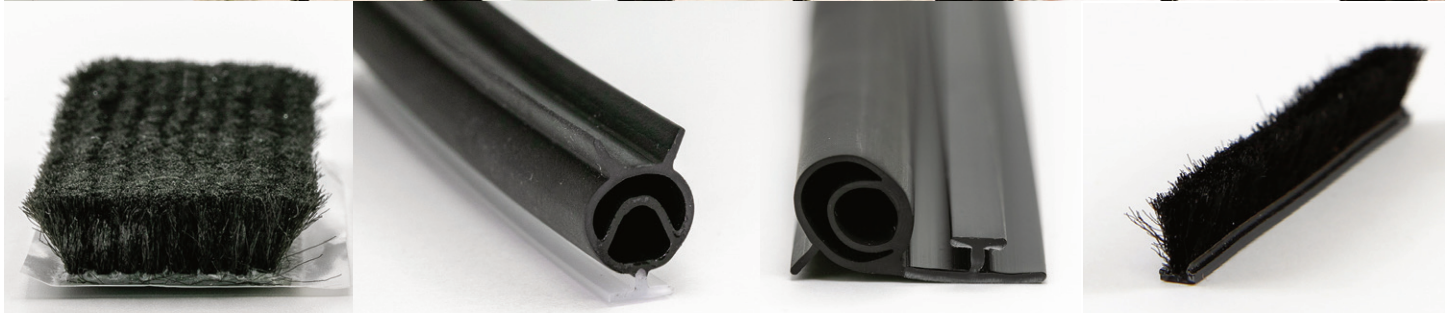
Todd went through the interview process and passed her welding test, starting her internship with TGP early due to the COVID-19 pandemic. After graduation, she went into a full-time welding position and after three years, her knowledge of TGP products allowed her to become an assembly team lead.

“My knowledge and understanding of manufacturing were very limited before MFG Day. I knew I wanted to do something with the trades, but didn't fully know what, as I was still trying to figure out what I wanted to do after my senior year,” adds Todd.

If you or your company are interested in participating in, or hosting, a Manufacturing Day event, visit the Manufacturing Institute's website for more information at [mfgday.com](https://mfgday.com). Educational resources, including workforce development and manufacturing careers advancement, can also be found at [glass.org](https://glass.org). ■

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A GUIDE TO

# RECRUITING

AT HIGH SCHOOL CAREER FAIRS





# CAREER FAIR BASICS

High school career fairs are a great way for companies to talk with students about post-graduation job opportunities. Depending on the school district, career fairs take place at schools during classroom hours or at community centers after-hours. Usually, each company has its own table to use for conversations and activities. The students who attend typically vary in age, providing opportunities to talk with seniors looking for employment shortly after graduation and younger kids who are considering a job in the trades but aren't sure what their options are.



## HOW TO FIND A CAREER FAIR

- Identify your local school district
- Do a Google search using the key words: high school student career fair, (your school district name), (your city)





# TABLE & BOOTH ESSENTIALS

A well-designed exhibit table or booth at a career fair can effectively showcase your company and attract potential candidates. Here are key elements to include:

- Tablecloth
- Giveaways (stickers, totes/drawstring backpacks, pens, notebooks, candy/snacks, etc.)
- Stand-up materials (banners, backdrops, posters or signage)
- Materials for a hands-on activity
- Business cards and informational material about your company

## Capture Student Information

Have business cards, brochures and postcards with company contact information on hand. In addition, provide a sign-in sheet for students to fill out with their name, personal email address, phone number and area of interest. Note, schools prohibit companies from contacting students via their school email address. Ask students if they prefer to be contacted via personal email or phone.



## USE TECHNOLOGY TO GRAB ATTENTION

If you have the resources, grab students' attention using technology.

Consider:

- Laptops or tablets to allow students to watch videos
- VR/AR experiences, including installation demonstrations or virtual project tours



# WAYS TO ENGAGE STUDENTS

## Activities

Career fairs bring together students, employers and industry experts and are your chance to show off your trade. Set up interesting and fun activities to help students learn what you do and inspire this next generation. Here are some activities to consider:

- Basic, interactive demos such as glass cutting
- Mockups that allow students to “install” glass
- Glass samples that students can handle and examine
- Games with prizes (prize wheel, guess how many jellybeans are in the jar, etc.)

*\*Make sure all activities and materials are approved by the event organizer*

## INSTALLATION MOCKUPS

NGA member company AllStar Glass, in Spokane Valley, Washington, created a mockup for its local Trades Night event that allowed students to handle and install glass components under team supervision. The company's fabrication department recently designed a new display that is easier to transport and fits through a standard door frame.





# WAYS TO ENGAGE STUDENTS

## Talking Points

Make a personal connection with students. Tell them why you love your job, how you got into the industry and why you've stayed. Keep it real. Be transparent.

Ask students what grade they are in. Remember, sophomores (10th graders) are just starting to think about whether they want to go to college or pursue a trade, while seniors may have already decided they want to go into the trades and are deciding which one to pursue.

Ask students if they are taking CTE (career technical education) classes at their school. If they are interested in becoming a glazier, for example, encourage them to take courses in the construction pathway.

## GLAZIERS ON THE JOB

For additional information on the glazing trade, in particular, students can visit [www.glass.org/become-glazier](http://www.glass.org/become-glazier), a new web page that shows glaziers on the job, explains what they do, and provides information on salary potential and job opportunities.



## BE FRIENDLY AND APPROACHABLE

Staff your table with outgoing people who are enthusiastic about their jobs and can strike up conversations easily, even if it means calling out to students to attract their attention. Remember, students may be shy.



# TIME AND COST CONSIDERATIONS

The amount of time and money you will need to invest will vary depending on the event organizer, event type and scale, location, and your individual setup. Factors to consider include:

## Costs

- | Table fee (oftentimes they are free, but costs can vary depending on the event)
- | Materials for hands-on activities
- | Branding and promotional materials
- | Travel (if the event is not local)
- | Compensation for personnel staffing the booth

## Time

- | Event preparation, including designing a hands-on activity, compiling promotional materials, and coordinating staff
- | Event duration, including the time required to set up and tear down the table
- | Event follow-up, including sorting through leads, contacting potential job candidates and evaluating the success of the event

*\*Make sure all activities and materials are approved by the event organizer.*



# FOLLOW-UP FOR PROSPECTIVE HIRES

Follow-up after a career fair is crucial to maintain and strengthen the connection established during the event. Students want to know you remember them personally, so send an individual thank you referencing something you remember specifically about them. The same is true of the school career counselors who organize the career fairs. Example emails might look like:

## To students

**Subject:** [Company Name] at XYZ Job/  
Career Fair Follow-Up

Hello (Student Name),

It was great connecting with you at the XYZ job/career fair! I wanted to send along some more information as I remember discussing \*insert personal memory from event if possible\*. Below you can find links to our website, available jobs and additional information. If you have a resume, feel free to email it to me and I would be happy to look it over. Any other questions are also welcome!

Best,  
Full Name  
Phone  
Email

## To career fair contacts

**Subject:** [Company Name] at XYZ Job/  
Career Fair Follow-Up

Hello (Contact Name),

Thank you for the opportunity to attend the XYZ career fair; I appreciate the time and effort you put into connecting students with companies like ours and look forward to working together in the future. If there are other opportunities to speak to students about the glass and glazing industry and the careers it offers, whether it be classroom visits or events, please let me know. I have also attached some printable information and job postings that you may be able to share around the school or on social media.

Thank you again, and I look forward to staying in touch.

Best,

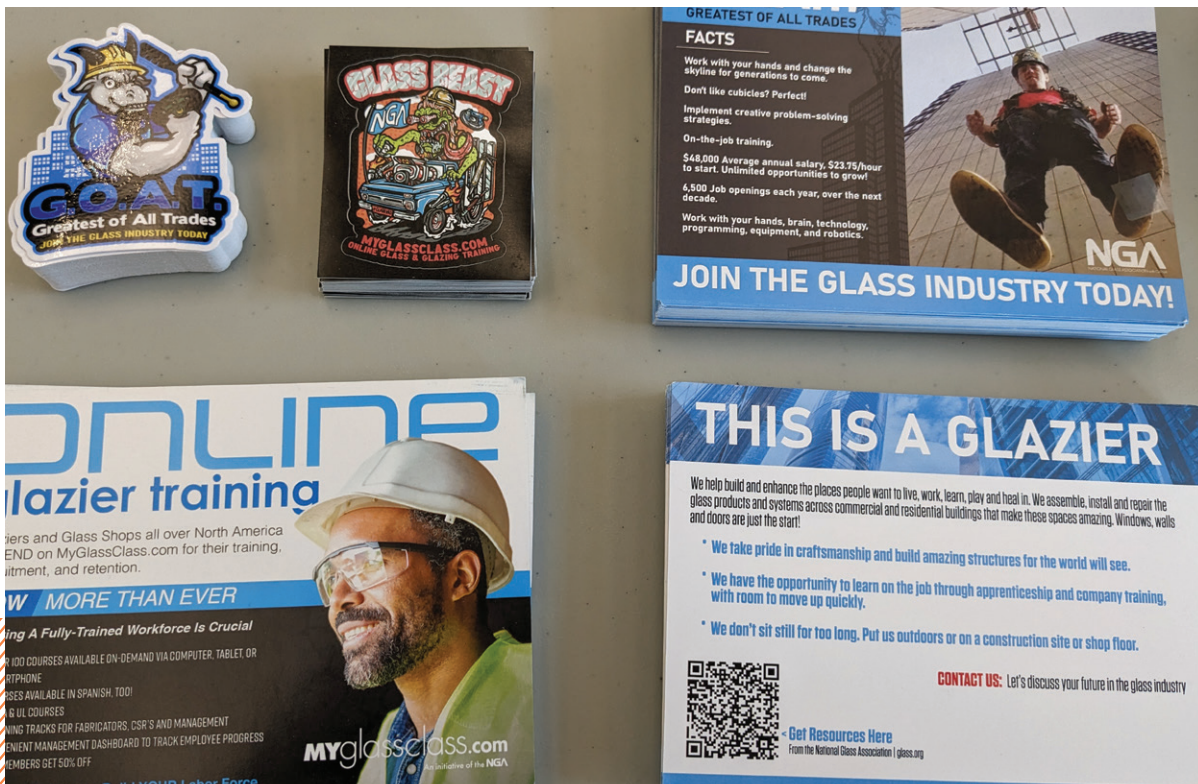
# RESOURCES & GIVEAWAYS



The National Glass Association remains committed to helping companies raise awareness of the glass and glazing industry, particularly among high school students and young people. Scan the QR code to visit the NGA store and download a digital copy of this guide, as well as purchase stickers, postcards and other giveaways that you can use at your next career fair.



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# GUIDE TO GLASS

A CLOSER LOOK AT EMBODIED CARBON,  
PERFORMANCE CONSIDERATIONS,  
RETROFITS AND RECYCLABILITY



Lick-Wilmerding High School in San Francisco, California, specified Solarban 70 glass to introduce more transparency and daylight. In 2022, the school earned an AIA COTE Top Ten Award for sustainable design excellence. Photo by Michael David Rose Photography.

Globally, the construction industry is responsible for 33% of energy consumption and about 40% of greenhouse gas emissions. So when it comes to addressing climate change by reducing energy consumption and carbon emissions, the building community “has an important job to do,” says Tom Culp, energy code consultant for the National Glass Association and owner of Birch Point Consulting.

The glass and glazing industry plays an essential role in the building community’s efforts to improve efficiency and reduce emissions, says Culp, who was speaking during the panel, “Blueprint for Collaboration: The path towards sustainable facades,” hosted by the NGA the week of the AIA A’23 conference in San Francisco. Culp and the other panelists identified three key areas of focus:

#### **1. Reduce embodied carbon.**

Embodied carbon in construction refers to greenhouse gas emissions caused during the lifecycle of a building product, including raw material extraction, transportation, manufacturing and installation. For the glass industry, the energy-intensive glass manufacturing process is the primary source of embodied carbon.

“Where does embodied carbon come from in glass manufacturing? It’s heat,” says panelist Chris Fronsoe, national architectural team manager, Vitro Architectural Glass. “It’s where raw material goes up to about 3,000 degrees Fahrenheit and gets melted down into liquid material, and later in the float process goes back to solid.” For the manufacture of an insulating glass unit, roughly 75% of embodied carbon is generated during the manufacture of the raw glass lites in the float process due to the energy-intensive nature of the traditional float manufacturing process, says Fronsoe.

BY KATY DEVLIN, WITH  
CONTRIBUTIONS FROM RACHEL  
VITELLO





The First United Bank in Moore, Oklahoma, was designed by Gensler to support the comfort and well-being of all occupants, all while being sustainable. A three-story and 12,000-square-foot steel-framed glass curtain wall wraps around the bank's mass timber structure. The high-performance SteelBuilt Curtainwall Infinity Structural Silicone Glazing System from Technical Glass Products creates uninhibited sightlines to facilitate community engagement. Photo courtesy of TGP.

Several glass manufacturers have begun to change their processes to lower emissions in manufacturing. Increasing the use of cullet (crushed glass recycled back into the supply chain) in the process reduces the heat required to melt the materials in the furnaces, says Fronsoe. Additionally, a few glass manufacturers, such as Vitro, are using oxy-fuel technology in production, which can reduce energy consumption in glass-melting furnaces by as much as 20% and cut greenhouse gas emissions in half, he says.

## 2. Improve operational carbon.

Operational carbon, on the other hand, refers to the emissions produced during

a building's lifespan. The glass industry has made "tremendous progress" in meeting increasingly stringent energy-efficiency requirements in the building codes, says Culp. "In the 20-plus years I've been working in energy codes, [the industry] has cut energy use of buildings built to [the ASHRAE 90.1 Standard] by half."

In terms of thermal performance, the industry offers dual, triple and even quad IGUs. Fabricators have begun using two low-emissivity coatings in the IGUs for increased performance. And the industry continues to invest in next-generation thermal performance solutions, such as vacuum insulating glass and thin-triple

**UPGRADING INSTALLED WINDOWS IMPROVES TOTAL BUILDING ENERGY PERFORMANCE BY UP TO 20%, IMPROVES COMFORT AND HEALTH FOR OCCUPANTS, AND REDUCES OPERATIONAL COSTS AND CARBON EMISSIONS.**

IGUs, which provide even better efficiency within a narrow profile.

The glass industry also offers solutions to manage solar heat gain, which impacts building operational carbon. Tinted glass and switchable glass products, such as electrochromics, can further improve operational carbon.

Finally, using renewables will be essential in helping buildings become carbon neutral, or net-zero. Rooftop solar or building-integrated photovoltaics, or BIPV, will help push operational carbon emissions even further. “Efficiency is one half of it, renewables are another,” says Culp.

### **3. Increase recycling and reuse.**

During the panel, Lisa Rammig, director, Eckersley O’Callaghan, offered insights on how the industry could “reshape the future of glass” through an increase in flat glass recycling and an emphasis on rebuilding facades on existing structures.

Only 6% of flat glass is recycled, according to 2017 estimates from Deloitte. If it is recycled, it is typically downcycled to glass bottles, insulation or road filler. “Glass is a material that is fully and eternally recyclable, so why do we recycle so little flat glass? We need to change the status quo [of glass recycling],” says Rammig.

Additionally, Rammig encourages refurbishment—bringing new life into existing buildings—rather than constantly building new ones. “Don’t build. Reuse,” she says. “We should think about how we should extend the lifetimes of the buildings we have.”

Panelist Sophie Penner, associate director, special projects at Enclos, agrees. New buildings should also be “designed for disassembly,” she says. This means there will be easier recovery of products and materials when a building is disassembled or renovated, meaning less construction, and thus less carbon, will be produced.

Glass Magazine’s 2024 All About Glass & Metals: Guide for Architects digs into these key considerations for glass sustainability. It adapts several NGA resources on sustainability developed by volunteer industry experts.

Part 01 offers a closer look at the payback of high-performance systems and retrofits. Part 02 addresses glass Environmental Product Declarations, a key product sustainability measurement. And Part 03 digs into the opportunities and challenges of glass recycling. All three resources, along with numerous others about the sustainability and performance potential of glass, are available in full in the NGA store at [glass.org/store](https://glass.org/store).

## **PART 01**

### **THE PAYBACK OF HIGH-PERFORMANCE WINDOWS AND RETROFITS**

Higher-performing façades mean higher-performing buildings, resulting in improvements in operational carbon. Some considerations about retrofits, the payback of high-performance systems and building resiliency:

#### **1. Window retrofit is key to decarbonization.**

Residential and commercial buildings are responsible for almost 40% of North America’s carbon dioxide emissions and energy usage. For example, existing buildings with inefficient windows account for about 70% of New York City emissions. Additionally, 80% of buildings that will exist in 2050 already exist today, meaning retrofits will be critical to improving operational carbon on a large scale in decades to come.

#### **2. High-performance windows are up to 80% more efficient than standard windows.**

New residential windows that qualify for the Energy Star Most Efficient designation are up to 40% more efficient than new standard windows. Upgrades in window technology in the last 20 years have significantly improved heat-loss performance for residential and commercial structures.

#### **3. New windows can pay back embodied carbon in less than a year.**

Glass is typically 2% to 5% of a



Part 01 is based on the NGA document, “High-Performance Windows Can Help Save the World,” available through the QR code.



building project's embodied carbon. Upgrading to a more efficient glazing system will initially add some additional embodied carbon. However, in both commercial and residential installations, operational energy/carbon savings from the more efficient windows will offset that initial increase in six to 20 months in a cold climate, and thereafter, provide additional annual carbon savings.

#### 4. Decarbonization efforts should include both embodied and operational carbon.

Existing legislation targeting embodied carbon does consider the long-term benefits that glazing materials provide by mitigating annual carbon impacts through ongoing operational cost savings. Upgrading installed windows improves total building energy performance by up to 20%, improves comfort and health for occupants, and reduces operational costs and carbon emissions.

#### 5. High-performance glass is used in on-site renewable energy products.

High-performance glass is a key component in the domestic supply of solar panels and BIPV. Increased use of on-site renewable energy is critical to achieving net-zero energy and carbon targets, and will also help improve grid resiliency and U.S. energy independence.

#### 6. High-performance windows improve building resiliency.

In the event of extended power disruption, high-performance windows enhance building resiliency and maintain habitable interior temperatures for longer periods of time. Improvements allow for the downsizing of replacement mechanical systems and more effective use of funding, while increasing building resiliency in extreme weather and blackouts.

#### 7. Retrofitting buildings with high-performance windows creates job opportunities for a skilled workforce.

Installation of high-performance window products supports skilled worker job creation along with urban renewal. At the local level, changes in building performance standards requiring improvements in existing buildings are taking off, but adoption among cities is scattered. Federal-level initiatives encouraging window and building envelope upgrades, as well as lighting and mechanical system updates, would create additional manufacturing demand and related jobs.

### PART 02

## GLASS EPDS AND CAUTION OVER COMPARISON

Environmental Product Declarations enable the assessment of the environmental impact of products and label them accordingly. They contain extensive and independently verified environmental data about a product, from raw material procurement to disposal. EPDs allow consumers or design professionals in the building and construction industry to make better-informed decisions about the environmental impacts of the building material products chosen for projects.

However, it has been observed in the marketplace that architectural, engineering and construction professionals are trying to compare EPD values, which is not encouraged, nor always appropriate, and could lead to misleading conclusions.

#### Flat glass EPD

It is important to understand how to properly read, interpret and utilize the data published in the industry-average

Flat Glass EPD, developed by the NGA. This is especially critical when attempting to compare this data to manufacturer-specific flat glass EPDs, as well as the EPDs of other materials and systems.

NGA and its member companies created the industry-average Flat Glass EPD to better understand their glass products' environmental performance from cradle-to-gate. The NGA EPD conforms to the NGA Product Category Rule for Flat Glass, published by NSF in September 2020, which describes the format and requirements for conducting life-cycle assessments and creating EPDs for flat glass products. The Flat Glass PCR requires that EPDs include the following disclaimer advising against comparisons:

"This EPD was not written to support comparative assertions. Even for similar products, differences in declared unit, use and end-of-life stage assumptions, and data quality may produce incomparable results. It is not recommended to compare EPDs with another organization, as there may be differences in methodology, assumptions, allocation methods, data quality such as variability in data sets, and results of variability in assessment software tools used."

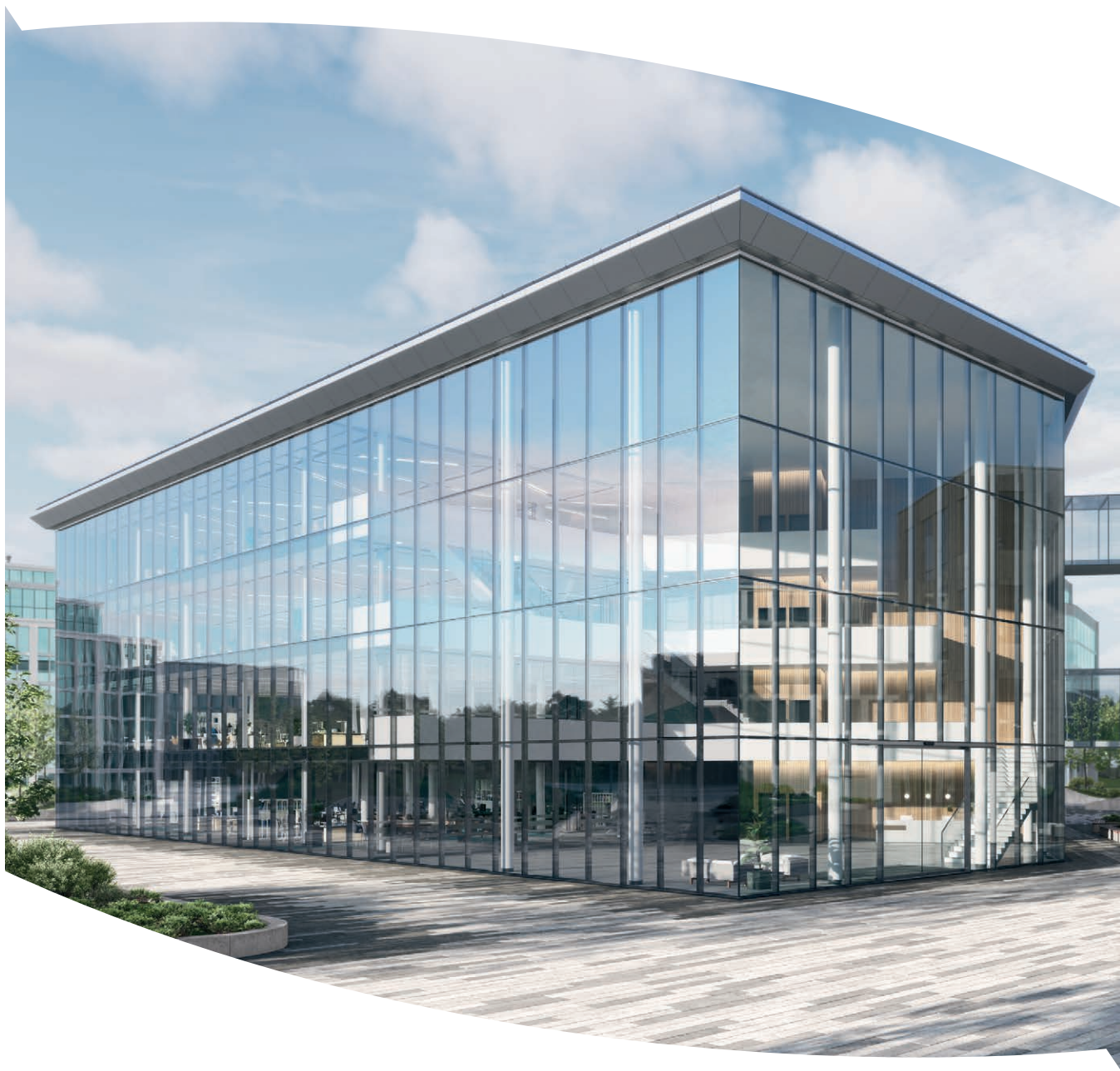
#### Caution against comparison

In general, EPDs may be used to inform and comply with the requirements of green building rating systems and legislative actions. The purpose of an EPD is to provide information on several environmental impacts of a product over the life cycle, either cradle-to-gate or cradle-to-grave.

EPDs typically rely on estimations of impacts, therefore the accuracy will differ for any particular product line and reported impact. EPDs are not meant to be comparative assertions and may not



Part 02 is based on the NGA Glass Technical Bulletin, "General EPD Education," available for download through the QR code.



# SunGuard® SNX70+. Enhanced neutrality,\* however you look at it.



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\*Within our North American SunGuard triple silver coatings portfolio. Images are artistic rendering intended to represent the reflected and transmitted color of the glass in real use conditions. Actual results may vary. The Guardian logo and SunGuard are trademarks of Guardian Industries, LLC and / or Guardian Glass LLC.

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The Moody Center on the University of Texas at Austin campus boasts a sweeping 360-degree curtainwall design featuring Solarban 70 glass from Vitro Architectural Glass. Photo by Tom Kessler.

be comparable or have limited comparability. According to clause 5.5 of ISO 21930:2017:

“Comparison of construction products using an EPD shall be carried out in the context of the construction works. Consequently, comparison of the environmental performance of construction products using the EPD shall consider all the relevant information modules over the full life cycle of the products within the construction works.”

This is reinforced in “Critical Issues When Comparing Whole Building & Building Product Environmental Performance” from the MIT Concrete Sustainability Hub:

“Only compare building products in the context of a whole building. With regards to building products, unless the thermal properties, such as thermal conductance and thermal diffusivity, and envelope permeability are exactly

the same, use of the products under comparison would cause different operational energy consumption.”

#### LEED v4.1

In acknowledgment of the challenges associated with comparing EPDs, LEED v4.1, option 2, attempts to address this by limiting comparisons to be made using an individual product EPD and demonstrating measurable improvements in different versions of that EPD. This is in contrast to LEED v4.0, which compared an EPD to an industry-average EPD. LEED v4.1 states:

“To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.”

#### Critical characteristics

EPDs are developed, particularly those per ISO 14025, with critical characteristics unique to that published document. Extreme caution should be used when comparing EPDs and the resulting global warming potentials. Significant differences may exist in some attributes, even for similar products. Comparing EPD values with differences in the characteristics below can yield large errors between the values and should be considered. When comparing EPDs, at a minimum, ensure the following are identical:

- The same Product Category Rule is used
- Declared unit (comparison of EPD results on a mass basis is insufficient; the technical performance of the product should be considered)
- System boundary (use and end-of-life stage assumptions)
- Data quality, such as variability in data sets and broad error margins in data
- EPD methodology and assumptions
- Allocation methods
- Variability in assessment software tools used
- Program manager (program operator)
- Data sources (GABI version, for example) on which assumptions are based
- Manufacturer-specific versus industry-wide
- Facility-specific versus multiple facilities
- Suppliers/supply chain
- Age of the EPD



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### ● ALL ABOUT GLASS & METALS: SUSTAINABILITY

#### PART 03

## GLASS RECYCLING OPPORTUNITIES AND CHALLENGES

Higher recycled material content is a key element for future decarbonization efforts for the glass industry.

Glass can be infinitely recycled in the flat glass and bottling operations, so continued reuse further supports the glass industry, supports a circular economy, and reduces waste and landfill. These benefits drive material choice decisions, for example, using glass containers instead of less recyclable materials such as single-use plastics.

Glass recycled materials can be used in various industries, from recycling back into the melt furnace to make new windows, glass containers, road grade, fiberglass, reflective highway paint, landscaping products, countertops and coastal restoration materials.

### Recycled glass is valuable

Recycled glass, or cullet, helps reduce the energy and emission burdens on glass manufacturing by:

- Reducing the need for raw material mining.
- Reducing trucking and related emissions, as making 1,000 tons of glass requires 1,000 tons of cullet or about 1,200 tons of raw material, or "batch."
- Reducing furnace emissions. Batch material and

firing fuels both off-gas during the glass-making process. Increased cullet usage significantly reduces the emissions from production.

- Reducing gas usage. Cullet is easier to melt than batch, so lower furnace fuel is required.
- Reducing global warming potential of glass, as less energy is needed to make glass when cullet is available.

### Recycling glass supports domestic supply and workforce

- Cullet should be considered a viable, reusable and sustainable domestic material supply chain.
- The glass recycling industry creates jobs and tax benefits.

### Glass recycling is challenging

Economics and glass quality requirements present challenges for glass recycling.

- Freight costs typically drive recycling decisions. Long hauls of heavy products often make recycling a cost challenge.
- Sorting and cleaning of cullet for certain applications can be expensive. In contrast, landfill costs are generally inexpensive in the United States.
- Contamination from even trace amounts of certain elements like nickel and aluminum can dramatically impact glass quality. ■



Part 03 is based on the NGA document, "Window Recyclability: Circular Economy," available through the QR code.

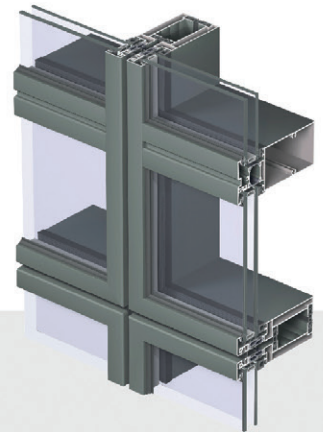


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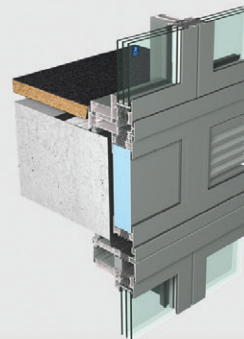
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Roto Patio Inowa is a premium hardware system that offers innovative technology, concealed design and unparalleled performance. The hardware has undergone rigorous testing against top-quality standards to ensure optimal performance. Additionally, the hardware

allows sliding doors to maintain a tight seal, even in severe weather conditions, thanks to the circumferential gasket and active locking points. The system also offers exceptional sound insulation and reliable burglary protection.

The innovative closing mechanism and specially engineered SoftClose and SoftOpen functions ensure smooth, effortless operation, while the sturdy rollers and integrated linear ball bearings reduce rolling friction and support additional weight, enabling large sliding elements to move effortlessly.

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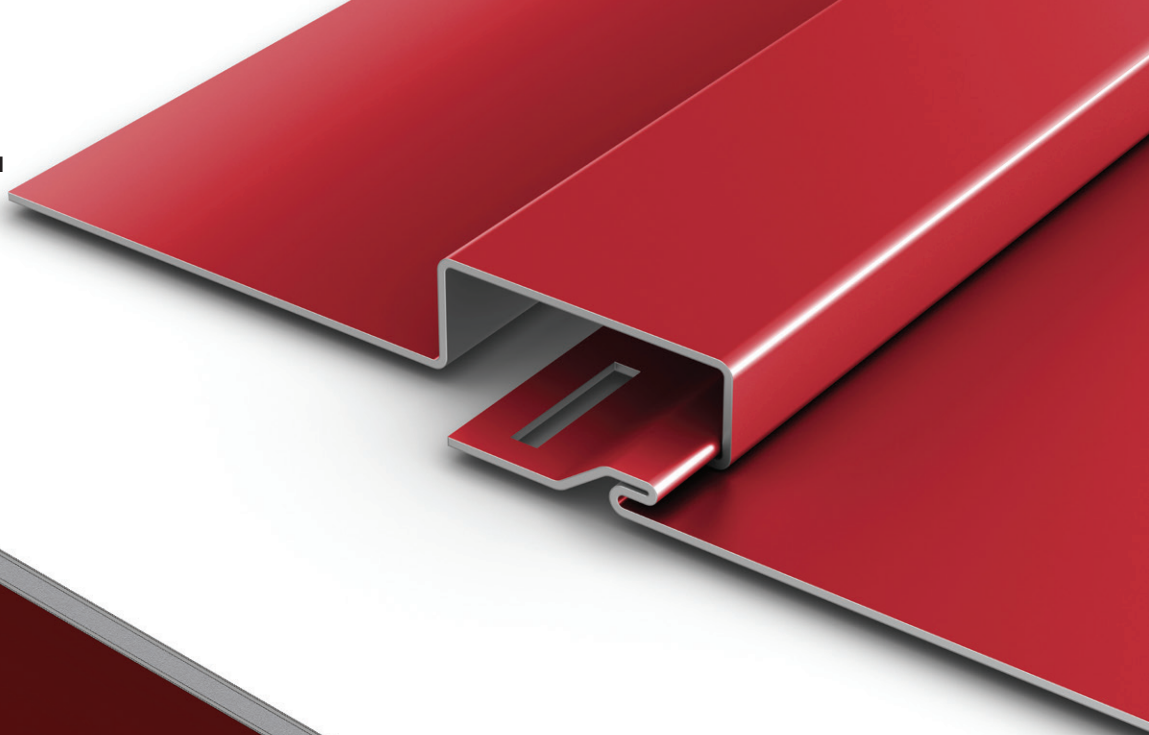
Patio Inowa is suitable for a wide range of applications, from windows to sliding patio doors. This versatility, along with well-crafted components, high-performance technology and a sleek appearance, makes this system ideal for the evolving demands of the sliding patio door market.

Visit [rotonorthamerica.com](http://rotonorthamerica.com) to learn more or call 860/526-4996. ■

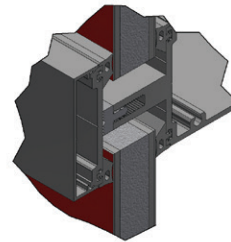
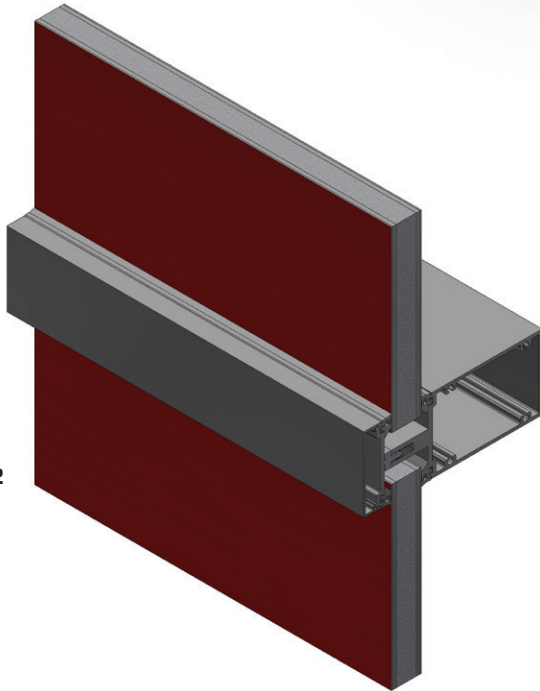
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01



02



### Mirror (not pictured)

Saint-Gobain's Miralite EasySafe is a shatterproof mirror that retains 98% of glass splinters in case of breakage. It is designed to provide peace of mind for building occupants and improve the safety of workers who process and install this anti-shatter mirror. Applications include decorative mirrors, sliding doors, bathrooms and children's rooms; professional settings, including offices, hotels, restaurants and shops; and high-risk environments such as sports halls and leisure centers.

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### 01. Wall panel system

The Board and Batten wall panel system by PAC-CLAD Petersen aims to expand the creative options for designers and specifiers of exterior cladding systems. This system uses concealed fasteners to maintain clean lines and provides a classic design aesthetic for residential and commercial applications. It is available in 24-gauge steel and 0.032 aluminum and can be installed only in vertical wall applications. The maximum lengths are 30 feet for steel and 22 feet for aluminum. Available panel widths include 12 and 16 inches.

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01



02



### 01. Awning window

Winco Window Co.'s 1150 awning window can now meet the operating force and motion guidelines to support the American Disabilities Act, making it one of the few aluminum window options to meet this requirement. It also meets the requirements set out by AAMA 513, which requires that operable windows have a force rating of less than 5 pounds, along with air, water, structural, operational and thermal cycling requirements.

314/725-8088 | WINCOWINDOW.COM

### 02. Sealant

The new MultiPro construction sealant from C.R. Laurence Co. is designed for both commercial and residential applications. MultiPro is available in 10-ounce and 20-ounce cartridges, in white, clear, black, bronze and gray. Benefits include durability, resistance to weathering and UV rays, extreme joint movement, time savings through simplified application, sealing capability on vertical and horizontal joints up to 2 inches wide, and being paintable.

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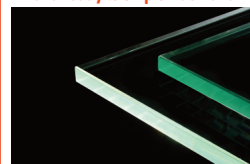
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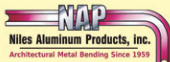
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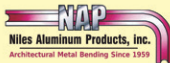
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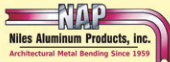
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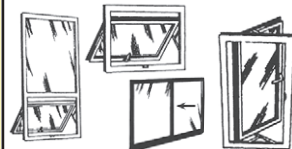
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From left: Richard Bright, Kristen Petillo, Cal Beyer, Bob Swanson

## DESTIGMATIZING MENTAL HEALTH DISCUSSIONS

BY NORAH DICK

Suicide is a complex and serious issue that disproportionately affects construction workers. To address this critical health crisis, 2023 GlassBuild America's Main Stage presented an educational panel on mental health awareness and suicide prevention. Hosted by Richard Bright, CEO of the American Subcontractors Association, the session welcomed Kristen Petillo, area director for the Georgia Chapter American Foundation for Suicide Prevention; Cal Beyer, national leader and consultant for workplace mental health and suicide prevention; and Bob Swanson, retired president of contracting firm Swanson & Youngdale Inc.

### The impact of suicide in construction

While data has historically been hard to gather, the existing statistics for deaths by suicide in construction are stark, says Beyer. Construction has the second-highest suicide rate among U.S. industries, second to mining. Beyer says since he started his career in 1995, he's seen overall construction fatalities decrease from 1,500 per year to 1,100.

### Recognizing and understanding risk factors

High rates of suicide in the industry can be traced to several complex risk factors, say panelists, some due to the nature of the work itself. Swanson, who is a suicide loss survivor and former contractor, talked about the

“demanding” nature of construction and how work conditions can worsen mental health, including the amount of travel involved and long working hours.

Petillo said that some of the warning signs that a person is experiencing a mental health crisis are social withdrawal, giving away possessions, and verbalizing hopelessness. Beyer said the affected person may say, “You’ll be better off without me,” or express feelings of being a burden to others.

### Changing construction culture to prevent suicide

Panelists encouraged construction business owners to change their company culture to aid suicide prevention. They stressed the importance of starting conversations with affected employees or colleagues when they see warning signs.

Petillo recommended reaching out and asking open-ended questions, such as “Are you okay?” and not “You’re good, right?” to give the person the freedom to respond. “They will be relieved that they are seen and can converse with you about their headspace,” she says. “It’s proven that having that conversation can save a life, so open that dialogue and ask that question.”

Destigmatizing suicides of coworkers is also critical to changing company culture, said panelists. “Don’t stigmatize the death further by treating it differently when you reveal the news to the rest of your staff,” says Swanson. “It’s the same [as other deaths]; it’s no different than if the person died of a heart attack.” ■



Read the full version, and find resources on workplace training, counseling, and other mental health and suicide prevention resources.

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