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MAGAZINE

THE GLASS AND GLAZING AUTHORITY • APRIL 2024

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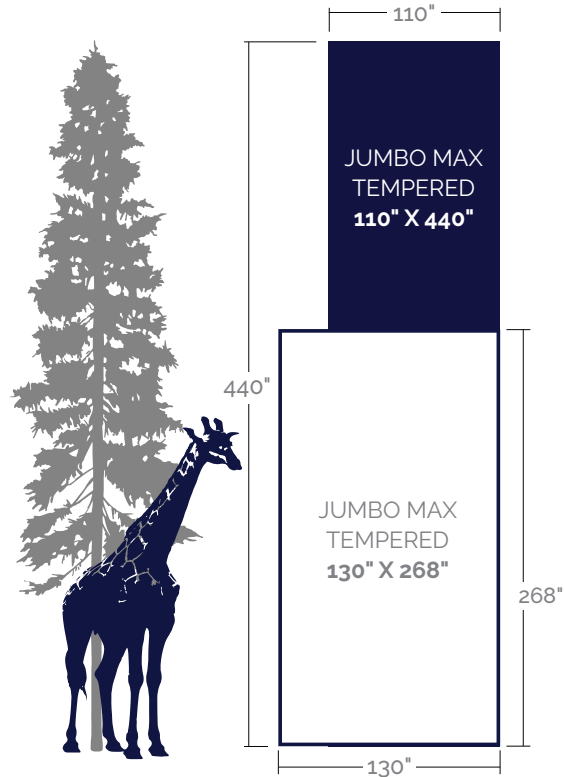


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Top Glass Fabricator project Morrow High School in Morrow, Georgia. Learn more about this project and other stand-out jobs from this year's Top Glass Fabricators, beginning on page 42. Photo by Jonathan Hillyer.

42



FEATURES

42. 2024 Top Glass Fabricators

Leading fabricators withstand the fallout from inflation and a changing economic landscape

BY NORAH DICK

- 44. The List
- 60. Products
- 62. Investment
- 64. Sales and Challenges

INSIGHTS

28. Legal

Governmental Contracting Lessons
BY MATT JOHNSON

34. Trendhunter

Shaping Interiors with Channel Glass
BY DEVIN BOWMAN

DEPARTMENTS

- 8. Editor's Notes
- 10. From the NGA
- 14. Glass Advocate
- 17. Glass Informational Bulletin
- 20. News to Know
- 37. Great Glazing: Pulp Studio
- 38. Q&A: Kalwall
- 66. Product Solution: CRL
- 67. Industry Products
- 70. Suppliers Guide
- 84. Reader Response Center
- 86. Here's An Idea

ON THE COVER: Employees from Top Glass Fabricator company Cristacurva handle glass on the factory floor. Check out the full report beginning on page 42.



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ANNUAL REPORT

NGA celebrates 2023 as a year of new initiatives, resources and commitments

RESOURCES

Access priority legislative one-pagers for 2024 Glass & Glazing Advocacy Days

WEBINAR

2024 Market Factors to Watch, on demand through the Thirsty Thursday series

GLASSBLOG



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PROJECT SHOWCASE



frosted glass panels features a 1-5/16-inch-thick walking surface.

Featured in Glass Magazine Weekly and on GlassMagazine.com. To submit projects or case studies, write Norah Dick, ndick@glass.org. Pictured: Sightline Commercial Solutions custom engineered a unique glass bridge for New Orleans's Audubon Aquarium to create a better viewing experience for visitors. The 735-square-foot glass bridge made of triple-laminated

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We Need to Talk about Opioid Addiction



KATY DEVLIN
Content Director
Editor-In-Chief
kdevlin@glass.org

Seventy percent of workplaces have been affected by the opioid crisis, according to estimates from the National Safety Council. In other words, most people reading this column have experienced or are experiencing opioid addiction in their companies, whether they know it or not. No company—and to bring this issue even closer to home, no family—is immune to the ongoing and worsening opioid crisis in the United States. We need to be talking about it.

This urgent call to action was highlighted during the 2024 Building Envelope Contractors Conference, held March 3-5 in Nashville and hosted by the National Glass Association. During the session “Straight Talk: Addiction Treatment & Recovery,” Cal Beyer, strategic partner with SAFE Project, and David Argus, operations director of the Contract Division for Karas & Karas Glass, presented some arresting and daunting statistics about the extent of the problem in construction. Consider the following:

162 OVERDOSE DEATHS PER 100,000 WORKERS

The construction and extraction industry faces the worst rate of overdose deaths, with 162 deaths per 100,000 workers per year, according to 2020 data (the most recent available) from the Centers for Disease Control and Prevention. By comparison, the industry with the second-highest overdose death rate per 100,000 workers is food service, with 118, and the average for all industries is 42.

“It’s time for us to stop being afraid of this topic. To recognize that people are hurting. Addiction is usually the result of unresolved stress, anxiety and other stress in our lives,” says Beyer.

19% OF CONSTRUCTION WORKERS HAVE SUD

Nearly one in five construction workers, or 19%, has substance use disorder. This compares to 8.5% of adults in the total population, according to data from the National Survey on Drug Use conducted by the Substance Abuse and Mental Health Administration.

“This impacts quality, productivity, risk and safety,” says Beyer. “Most organizations have

“

NO COMPANY—AND TO BRING THIS ISSUE EVEN CLOSER TO HOME, NO FAMILY—IS IMMUNE TO THE ONGOING AND WORSENING OPIOID CRISIS IN THE UNITED STATES. WE NEED TO BE TALKING ABOUT IT.

”

been impacted. I’ve worked with hundreds of construction companies nationwide, and they have all been impacted.”

34.1% OF CONSTRUCTION WORKERS HAVE AN MSD

Many opioid addictions begin with prescriptions for painkillers following injuries or surgeries, particularly MSD, or musculoskeletal disorders. MSDs are pervasive in construction—in fact, more than one in three workers suffer from some form of MSD.

“This is a gateway to opioids,” says Beyer. “The best addiction treatment, suicide prevention and overdose prevention strategy is to continue to focus on injury prevention.”

The first step in addressing opioid addiction in your workplace is acknowledging it and talking about it. “We need to stop being afraid of this topic,” says Beyer. “This impacts your workforce, your people, your families and your business performance.”

There is much more to this story, and to the steps companies can take to create a safe space for workers to talk about their struggles and find success in recovery. The NGA and Glass Magazine will continue to focus on this topic. For now, talk to your people, talk to your family and let’s all start chipping away at the stigma of addiction. ■



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YOUR ASSOCIATION AT WORK

NEED-TO-KNOW INFORMATION FROM THE NGA

COLLABORATION, CODES AND STANDARDS, AND BEST PRACTICES LEAD CONVERSATIONS AT NGA GLASS CONFERENCE: ISLE OF PALMS | CHARLESTON

Industry technical leaders at the NGA Glass Conference: Isle of Palms | Charleston in Isle of Palms, South Carolina, focused on new codes and standards updates related to glass and glazing, U.S. Department of Energy and Environmental Protection Agency collaborations, the unique and unanticipated demands placed on spandrel glass and glazing from increasingly stringent energy efficient initiatives, laminating best practices and new fabrication instrumentation, retrofitting building stock with high-performance windows, and more. The four-day conference was held Feb. 5-8 and hosted by the National Glass Association, and include meetings of the NGA Advocacy, Fabricating and Forming Committees.

Volunteer appreciation

The conference included a Volunteer Celebration Dinner where the NGA recognized industry volunteers who offer their time and expertise to the betterment of the industry through participation in NGA committees and task groups.

The NGA presented its 2024 Volunteer

of the Year Award to Aaron Thompson, principal research engineer, Viracon, who serves as chair of the NGA Fabricating Committee and has been involved in NGA activities for more than 15 years. "This organization wouldn't be what it is without all of your help," said Thompson while accepting his award. "You are what makes the industry great. Please keep coming. Please keep volunteering and doing your best work here. Being passionate."

NGA members David Evans, Guardian Glass; Tim McGee, Glass Coatings and Concepts; and Bill Sullivan, Brin Glass, were also recognized for their longtime participation and volunteerism.

Committee updates

The Advocacy Committee provided updates on NGA's upcoming Advocacy Days in Washington, D.C.; school safety and federal bird-friendly legislation; recycling architectural glass; and more.

The Fabricating Committee included

updates on the wide range of activities from its various segments: Decorative, Energy, Fire-rated Glazing, Insulating, Laminating, Mirror, Protective Glazing, Recycling/Sustainability and Tempering. For example, attendees heard presentations on thermal bridging, bird-friendly glazing and glass for Europe, and updates on daylighting benefits and school security.

The Forming Committee gave updates on several sustainability initiatives such as federal Buy Clean initiatives and the Inflation Reduction Act, flat glass standards and resources, and task group updates.

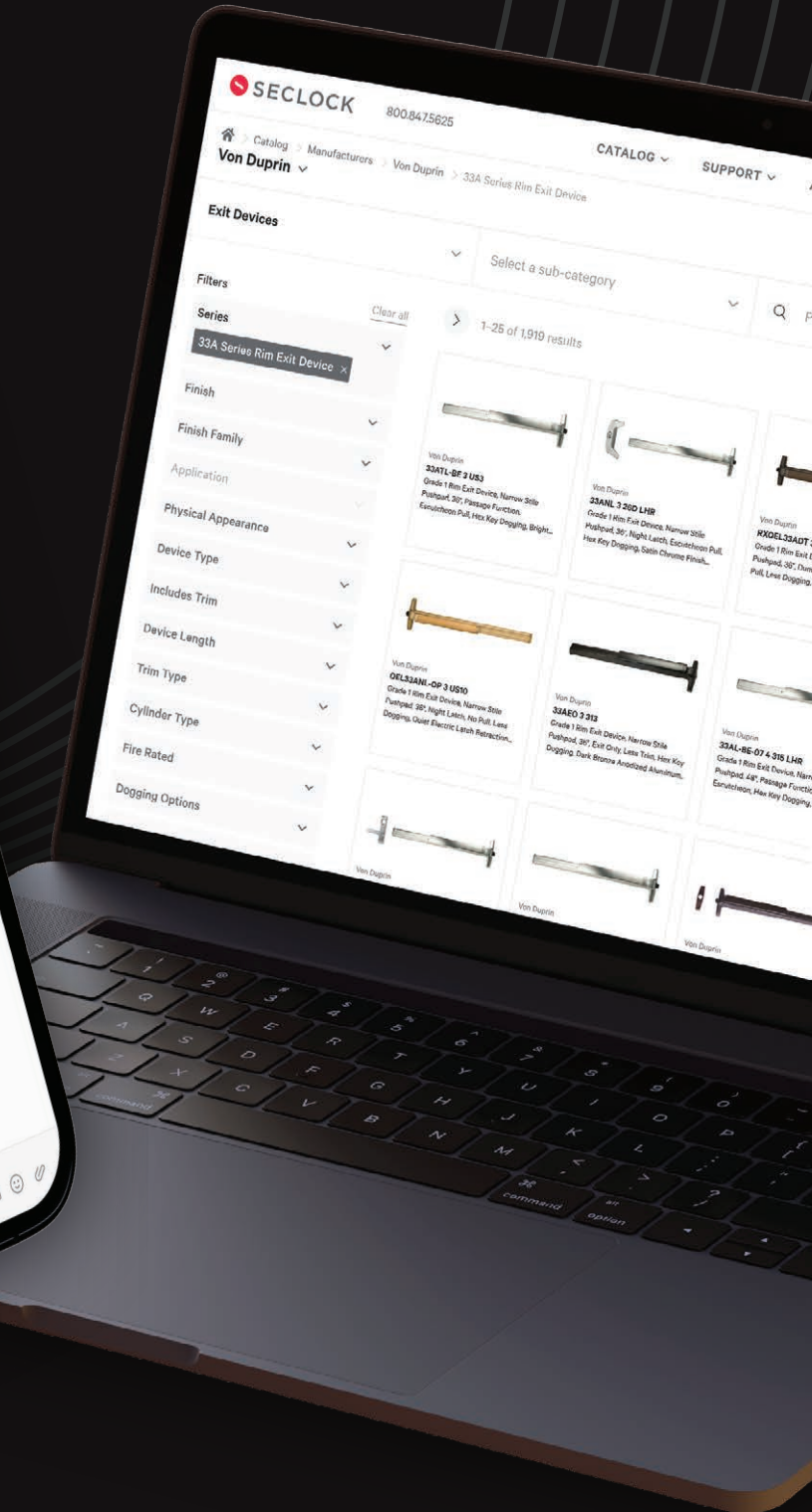
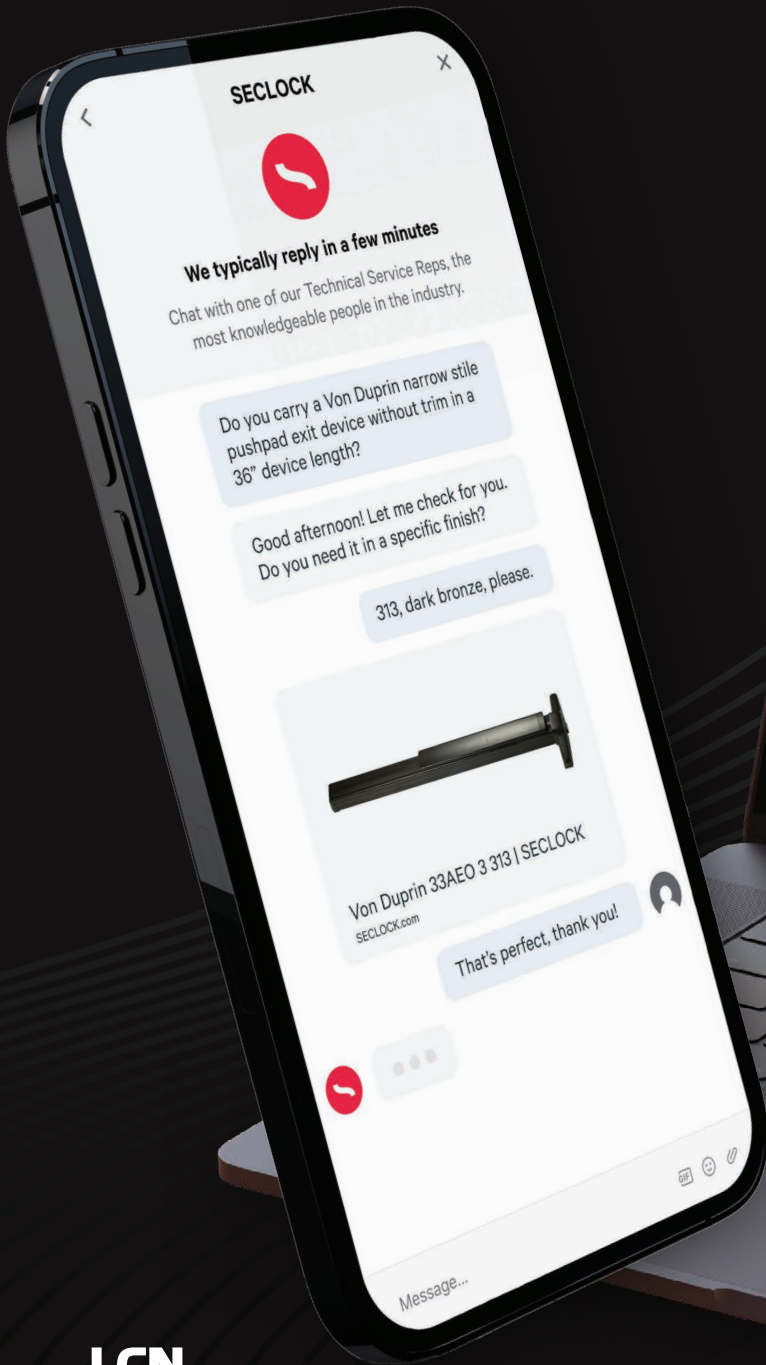
The Installing Committee met in March at the BEC Conference in Nashville, Tennessee. ■



View the highlights

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YOUR ASSOCIATION AT WORK

NGA PRESENTS 2023 ANNUAL REPORT

The National Glass Association is the authority and resource for its members and the industry to grow successful businesses and to champion the benefits of glazing and glass building products. In this past year, it started, and continued, several initiatives to fulfill its strategic goals and serve the membership.

“This annual report captures highlights of those positive impacts from the past year,” says Nicole Harris, NGA president and CEO. “You will see the ways NGA continues to help members and

the industry grow and succeed, organized by our four strategic goals: Advocate, Educate, Workforce Development and Promote.” ■



Read the report

UPDATED GTPS AVAILABLE

The NGA Fabricating Committee updated three Glass Technical Papers in January. NGA’s GTPs are free to download in NGA’s online store at glass.org/store.



FB53-17 Benefits of Decorative Glass in Daylighting Applications



FB25-09 Performance Criteria for Glazing Subjected to Seismic Events



FB56-18 Heat Soak Testing

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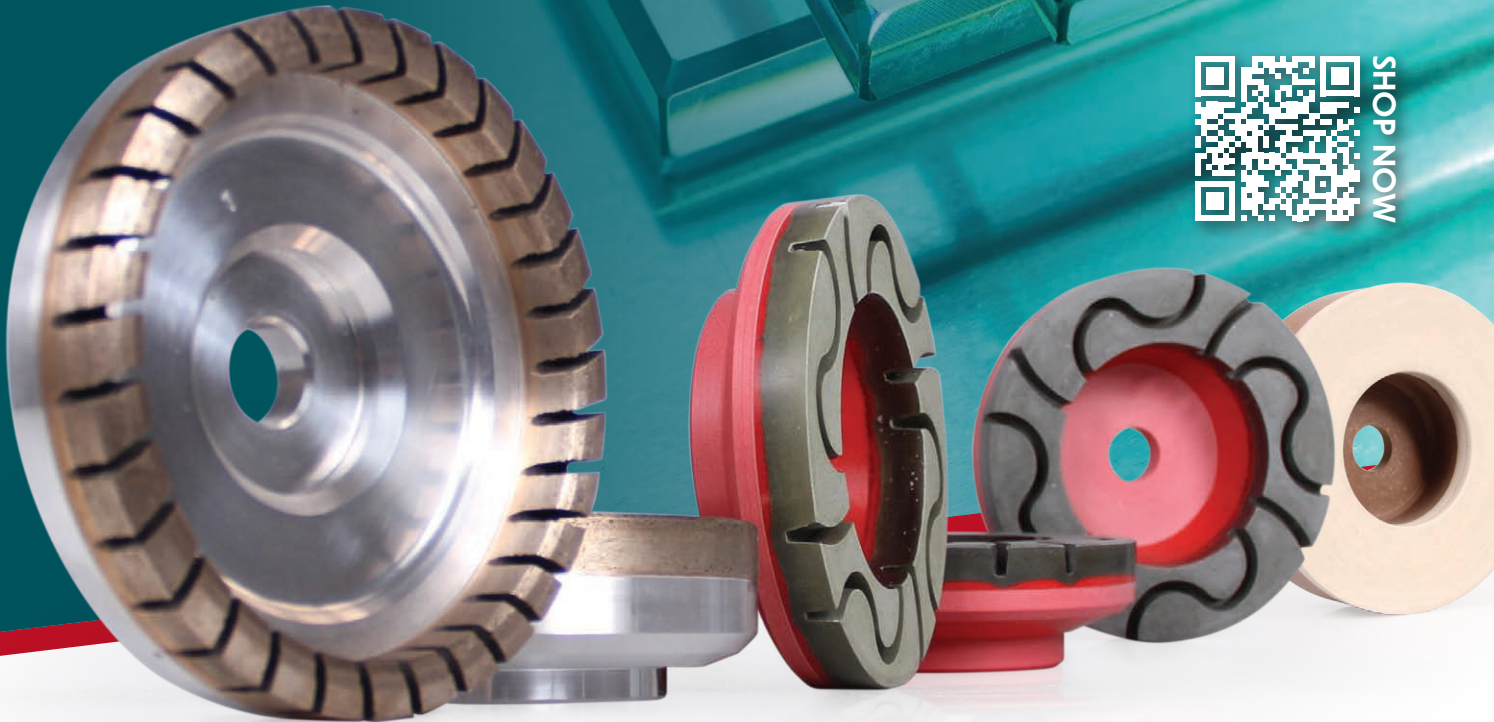
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GLASS ADVOCATE

THE FUTURE OF AI IN THE GLASS INDUSTRY

STAYING AHEAD IN TECHNOLOGY ADOPTION IS CRUCIAL FOR OPTIMIZING THE PERFORMANCE OF AI-DRIVEN SOLUTIONS **BY RON CROWL**



Artificial intelligence is a field of computer science that develops intelligent machines capable of tasks requiring human-like intelligence. It includes capabilities like learning, perception, problem-solving and reasoning.

Unlike rules-based systems, AI systems analyze complex data to make decisions and learn from experiences, continually improving performance. AI introduces efficiencies and capabilities and can potentially change business operations and customer interactions.

AI is already finding applications to enhance human capabilities, automate tasks and extract insights from vast data, thus reshaping our technological frontiers.

Embracing and preparing for rapid development

The future of AI is defined by rapid evolution, rendering medium-term predictions less significant than businesses' need to stay agile and remain open to ongoing change. At Cyncly, our approach to developing and deploying AI is founded on three core principles that guide our activities, ensuring that the solutions

we offer meet industry standards and align with our organizational values and customer needs.

01. Data-informed development

Our AI development is deeply rooted in leveraging comprehensive industry data. This approach ensures that our AI solutions are technologically advanced and tailored to the specific demands and nuances of the markets we serve.

02. Ethical application

We are committed to the ethical and responsible utilization of AI. This means prioritizing our AI solutions' safety, security and integrity, and ensuring they are used to benefit our users without compromising ethical standards.

03. Practical solutions

We focus on creating AI applications that provide practical and tangible benefits to our customers. We design our AI tools to directly address the challenges and opportunities within our industries, enhancing the efficiency and effectiveness of our customers' operations.

Staying current with the latest technology is crucial for optimizing the performance of AI-driven solutions. This includes regularly updating software to ensure compatibility with new AI features and embracing digital business processes with project data stored consistently.

Strategic technology planning

We advise our customers to engage in strategic technology planning. This involves not just reactive updates but proactively anticipating and preparing for technological trends. By staying ahead in technology adoption, businesses can ensure they are always ready to leverage the latest AI innovations to their advantage.

In Cyncly's Kitchen, Bathroom and Furniture retail solutions group, AI is transforming design processes by swiftly creating initial designs from user inputs, speeding up project stages, facilitating design iteration, and enhancing customization. Moreover, AI renders more precise and realistic visualizations, enabling Cyncly customers to offer personalized, quality services while protecting their margins, and improving client understanding and satisfaction as well as operational efficiency. Cyncly's AI tools meet diverse consumer needs, driving innovation and quality in design.

Vision for AI in the glass industry

Cyncly's commitment to integrating AI in the glass industry is spearheaded by the recent establishment of the AI Innovation Center, a hub for developing AI functionalities across our product portfolio in concert with our industry experts and product development teams, focusing on enhancing efficiency and decision-making. Two potential near-term AI applications are:



©Michael Moran/OTTO



PROJECT SHOWCASE

Lincoln Center's David Geffen Hall

New York, NY

The new Lincoln Center David Geffen Hall, designed by Diamond Schmitt and Tod Williams/Billie Tsien Architects, was decades in the works but completed ahead of schedule and under budget since the pandemic forced the closure of the Avery Fisher Hall.

The first priority was to improve and revitalize the acoustics inside the main theater, to make sure it was the best-in-class acoustic experience for the New York Philharmonic. What resulted is a completely new theater inside the building, not just a renovation, creating an intimate and inclusive experience for the audience.

Everything in the building, from door handles to floorboards to railings, feels reassuringly solid. Pulp Studio fabricated over 8,700 square feet of flat and curved, laminated glass railings, using an acid etch glass to meet the design aesthetic and provide an enhanced level of privacy. The bent glass was chemically strengthened for increased surface protection and Pulp Studio's proprietary Precision Edge[®] technology was used on all the flat glass for a refined and professional look.

Social/Public Spaces: Tod Williams Billie Tsien Architects / Concert Hall: Diamond Schmitt
Photos: Michael Moran Glass: Lafayette Metal & Glass Company - Hauppauge, NY
Owner Rep: CMDC Consulting, LLC / Acoustics: a-ku-stiks/ Theatre: Fisher Dachs Associates
Mechanical/Electrical: Kohler Ronan, LLC

GLASS ADVOCATE

1. Auto-replacing purchase orders for stock replenishment. In this potential use case, AI takes over the critical task of stock management. By automating purchase orders, the system ensures that stock levels are maintained efficiently, without the need for manual intervention.

This AI functionality is designed to analyze stock levels, predict future requirements based on usage patterns, and automatically place orders to replenish stock. This streamlines inventory management and reduces the risk of human error, ensuring that the supply

chain is uninterrupted and responsive to demand fluctuations.

2. Intelligent monitoring of production throughput. Another key area where AI is set to make a significant impact is in monitoring and optimizing the throughput of each machine and workstation in the glass manufacturing process.

The AI system learns from operational behavior and adapts to the complexities of the manufacturing process. It can predict bottlenecks, suggest optimal workflows, and ensure that each component of the manufacturing line is

operating at peak efficiency.

This application of AI promises to enhance productivity and reduce downtime by intelligently managing the capacity and throughput of manufacturing resources.

The future is here, and AI powers it. To embrace the transformative potential of AI, you need to be ready. We are. Are you? ■

Ron Crawl is general manager, window, door and glass, at Cynclly, and the current board chair of the National Glass Association.



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GLASS INFORMATIONAL BULLETIN

DESIGNING WITH CAST AND HEAT-FORMED DECORATIVE GLASS

Heat-formed decorative glass

Heat-formed glass, sometimes referred to as heat-sculpted glass, is a category of decorative glass in which the pattern or design is incorporated through softening or melting of the glass using high heat. Once the final form is achieved, the glass is cooled. Heat-formed glass is available in various designs and different colors, thicknesses and textures ranging from standard to custom. These products can be used in many interior and exterior applications and are often used in public art installations.

Textured decorative glass diffracts and reflects light. The depth and shape of the textures created change the way light enters the building, allowing daylight into a space while managing glare and direct sunlight.

Safety glazing

Safety glazing may be required in certain circumstances, such as shower enclosures, interior partitions and doors. In these cases, the decorative glass can be



The National Glass Association is an approved AIA Provider and, thanks to the involvement of its volunteer members, has nine approved industry-consensus presentations available. Members may use these presentations when contacting architects and other interested parties. More architect resources are at [glass.org/aia-continuing-education](https://www.glass.org/aia-continuing-education). This Glass Informational Bulletin is an excerpt from one of the presentations.



GLASS INFORMATIONAL BULLETIN

BENT GLASS CAN BE MADE INTO MANY SIMPLE OR COMPLEX SHAPES; BUT MANUFACTURERS WILL HAVE A MINIMUM AND MAXIMUM RADIUS THAT THEY CAN PRODUCE.

laminated or include a surface-applied safety film tested and certified to safety glazing standards.

Slumped glass

Slumped or “kiln-formed” glass is produced by placing float glass into a kiln over a mold having the desired shape or pattern and heating to the temperature where the glass softens and “slumps” to the form of the mold. The formed glass is then annealed and can be further processed or fabricated. Each glass panel is produced individually, allowing each piece to be unique or for an artistic pattern to be carried through the entire installation. When specifying slumped glass, be aware that variation can occur in the pattern and thickness of the glass, and deep texture may limit the ability to heat treat the glass.

Cast glass

Cast glass is made by either pouring or blowing molten glass into a mold. As the glass goes through a long, slow cooling process, it hardens and takes the shape and texture of the mold. Typical applications for cast glass are glass block, glass tile, lighting and fixtures, sink bowls, architectural accents and public art installations. Cast glass allows for artistic expression in very small batches.

Fused glass

Fused glass is created by melting in a kiln and fusing together two or more

types and colors of glass. Not all glass types can be successfully fused. Each type and color of glass has a “coefficient of expansion,” which is the amount and rate at which the glass expands as it is heated and contracts as it cools. To fuse glass, each piece should have a similar coefficient of expansion to avoid cracking during the heating or cooling process. When specifying fused glass in an installation, ensure that the glass can be manufactured in the sizes you require. Fused glass is typically made in smaller sizes than more traditional architectural glass. Sometimes, the opening may need to be divided into sections to accommodate smaller glass lites. Some designs with large variations in thickness may not be able to be heat treated.

Bent/curved glass

Bent or curved glass is flat glass that has been formed into a curved shape or profile using high heat and a mold or frame. It is used for both functional and decorative purposes and can be heat treated, further fabricated into laminated or insulating glazing units, and may incorporate a variety of other decorative features. Bent glass can be used in applications such as railings and balustrades, windows, furniture, revolving entrances, shower and bath enclosures, display cases, and architectural facades.

There are a few issues to consider

when specifying bent or curved glass. Bent glass can be made into many simple or complex shapes; however, all manufacturers will have a minimum and maximum radius that they can produce. Also, due to the heating process, there may be some optical distortion in bent glass, but modern technology has reduced this significantly.

Rolled cast glass

Also known as patterned, textured or obscure glass, rolled cast glass has been imprinted with a texture or pattern at high temperatures while still in a molten or malleable state. Unlike slumped or kiln-cast glass, patterned glass is made directly from a mix of raw materials rather than already manufactured glass. It is offered in large sheet sizes in various patterns, and can be cut and fabricated. Most patterns are directional, meaning the pattern runs in one direction. When considering sheet size, the direction of the pattern should also be considered. Some patterned glass can be heat-treated or laminated.

Channel glass

Channel glass is a structural glass system that creates light-transmitting walls for interior or exterior applications such as curtain walls, storefronts and rain screens. A series of U-shaped cast glass channels is installed into a perimeter frame that allows glass openings to be formed into arcs, serpentine walls, and columns or tower designs. To specify a channel glass system, select the appropriate framing system, select the desired glass texture combination and determine the glass performance requirements such as wind load, thermal and safety requirements. ■

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Oldcastle BuildingEnvelope Acquires Midwest Glass Fabricators

Oldcastle BuildingEnvelope Inc. completed the acquisition of Midwest Glass Fabricators Inc. Founded by the Iaquinto family in 1989, Midwest Glass is a glass fabricator headquartered in Highland, Michigan, and specializes in manufacturing commercial and consumer architectural glass products.

“Midwest Glass has built an impressive business rooted in exceptional product quality, reliability and customer service,” says Bruno Biasiotta, CEO of OBE. “Our customers and partners will benefit from the combined expertise of OBE and Midwest Glass through a broader portfolio of products, expanded geographic coverage, and access to OBE’s industry-leading tools and services. We are thrilled to welcome Midwest Glass and its dedicated employees to the OBE family. This acquisition further demonstrates OBE’s proven track record of successfully partnering with family-owned businesses and providing them with strategic capital and resources required to pursue future growth opportunities.”

“Joining OBE is a transformational milestone for Midwest Glass. This partnership will provide growth opportunities for our employees and enhance our ability to continue serving our loyal customer base built over three decades,” says Pat Iaquinto, co-founder of Midwest Glass.

Lockmasters Acquires JLM Wholesale

Lockmasters, a supplier of security solutions, has acquired JLM Wholesale.

The combined companies and

complementary cultures will provide its customer base with access to an enhanced suite of security products with many benefits. Benefits are expected to include a greater portfolio of products and services, products and tools using Lockmasters’ customer-centric manufacturing and design expertise, expanded inventory, personalized technical support, and training and education.

JLM says that customers’ contacts and the way it does business will remain unchanged as part of this transaction.

St. Cloud Window Now under New Ownership

St. Cloud Window, a manufacturer of commercial aluminum fenestration products, announced a change in ownership, headed by a team of entrepreneurs and executives with experience in the construction and manufacturing sectors.

“Our decision to acquire St. Cloud Window was motivated by its longstanding reputation for manufacturing superior architectural fenestration products and unwavering commitment to customer satisfaction. While there will be new additions to the top-level management team, the standards of meticulous operations and exceptional customer service will remain unchanged,” says owner and CEO Paul Harry.

Apogee Enterprises Consolidates Segments, Moves Some Operations

Apogee Enterprises Inc. officials say they are planning actions to further streamline business operations, enable a more efficient cost model and better position the company for profitable

growth, referred to as Project Fortify.

The new initiative involves several strategic actions related to the Architectural Framing Systems, or AFS, segment. These include eliminating certain lower-margin product and service offerings, enabling the consolidation of AFS into a single operating entity; transferring production operations from the company’s facility in Walker, Michigan, to the company’s facilities in Monett, Missouri, and Wausau, Wisconsin; and simplifying the segment’s brand portfolio and commercial model to improve flexibility and better leverage the company’s capabilities and enhance customer service.

Additionally, the company will implement actions to optimize processes and streamline resources in its architectural services and corporate segments.

“The actions we are announcing progress our enterprise strategy and help position the company to build on what we’ve achieved over the past two years,” says CEO Ty Silberhorn. “Project Fortify will further improve our cost structure, enhance organizational efficiency and enable our team to focus on higher-growth, higher-margin opportunities.”

Industry Veterans Launch New Glazing Hardware Supplier, Aria Vetri

A team of industry veterans with over five decades of combined experience has launched Aria Vetri, a new provider of glazing hardware materials to the professional glass industry.

The new company assumed the North American operations of CASMA Italy, which has been operating in the U.S. as



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NEWS TO KNOW

DHD International Inc. CASMA is provider of European patch fittings, hydraulic hinges and closers, sliding door systems, and other related commercial hardware. With this addition, the company portfolio now includes shower hardware, commercial door rails, patch hardware and glazing supplies.

Aria will continue to operate out of the Baltimore warehouse, and staff will

continue to assist customers on their technical matters. Additionally, Aria is planning to expand its operation to the West Coast in late 2024.

Assa Abloy Closes Its Charlotte, North Carolina, Plant

According to local reporting, Assa Abloy will be closing a Charlotte, North Carolina, facility, resulting in the

elimination of 87 jobs.

The Assa Abloy Americas Residential Inc. affiliate submitted the notice to the North Carolina Commerce Department. It affects the Spectrum Brands facility at 15040 Choate Circle.

DOE Offers Funding for Secondary Glazing Systems

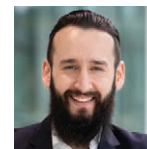
The U.S. Department of Energy launched the American-Made Building Envelope Innovation Prize—Secondary Glazing Systems, which will offer up to \$2 million to encourage production of high-performance, cost-effective secondary glazing systems to improve efficiency of commercial windows. Interested teams have until June 13 to provide design concept information for phase one of the program.

Saint-Gobain to Acquire Glass Service

Saint-Gobain has entered into a definitive agreement to acquire Glass Service A.S., a provider of digital solutions for glass furnaces, including advanced control systems and simulation software, which enables customers to reduce their energy consumption. Closing of the transaction is subject to antitrust approvals and is expected by the end of the first half of 2024.

Officials say the acquisition will complement Saint-Gobain’s range of digital services offering predictive, diagnostic and data-driven solutions to improve energy efficiency for its customers and reduce the carbon footprint of their products and processes.

PEOPLE



Diez

Vitro Architectural Glass promoted






Fernando Diez to vice president of marketing.

In this role, Diez will develop and implement

global marketing efforts and lead four multi-regional teams in North America, including Vitro’s Sample Program and Center for Architectural Design. In December 2022, Diez was promoted to

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NEWS TO KNOW

director of marketing, leading initiatives across the U.S., Canada and Latin America regions.



Perry

GED Integrated Solutions Inc.

appointed *Bill Perry* to spearhead machinery sales across the Western U.S. Having

worked for over two decades at GED in a variety of capacities, Perry most recently concentrated on broadening the market reach of the company’s software offerings. In addition to his ongoing role as the nationwide lead for software sales, Perry will now be responsible for boosting machinery sales in the Western region.

Glassfab Tempering Services Inc.

promoted *Greg Grothoff* to president, Southwest region. Grothoff began as vice president of strategic business development, where he exhibited



Grothoff

talent for building and nurturing business relationships, say officials. His role expanded to various strategic responsibilities within the company, including the launch of its aluminum storefront division.

Salem Fabrication Technologies has made two promotions. It promoted *Kent Kasem* to the position of Western regional sales director and *Micah Clodgo* to the position of Eastern regional sales director.

Kasem has six years of dedicated service with Salem Fabrication Supplies, coupled with 15 years of sales experience. He will cover the entire West Coast, Midwest and Canada.

Clodgo started with Salem back in 2006. As sales director, his territory covers the entire East Coast to



Kasem



Clodgo



Abney

Mississippi, Tennessee and north through Eastern Canada.

The company also added *Ben Abney* as Mid-Atlantic regional account manager. Entering the realm of field sales, Abney will leverage his wealth of knowledge and hands-on experience to cater to existing customers’ tooling, supplies, material handling and machinery needs while expanding Salem’s footprint across the Mid-Atlantic region, spanning from Maryland to South Carolina.

Unicel Architectural Corp. hired health care sales professional *Tomasina Leone* as regional sales manager for

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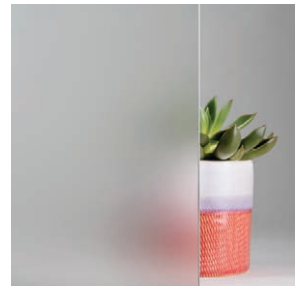




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Smith

YKK AP America Inc. promoted *Jennifer Smith* to architectural sales representative serving the Atlanta region. Smith will be responsible for building long-term customer relationships with commercial architects, glazing contractors and building project teams. Smith first joined YKK AP America in 2005. During her tenure, she has been successful in both estimating and customer service

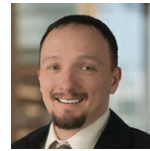
positions. Most recently, Smith served as senior customer service administrator for the Atlanta branch.



Brooks

Tubelite welcomed *Jessica “Jess” Brooks* as a client development manager covering Alabama and North Georgia. She works closely with glazing contractors and architectural teams to help them select and specify high-quality, aluminum-framed storefront, curtainwall, entrances, windows and daylight control systems.

Prior to joining Tubelite, Brooks served as a regional sales manager for Virginia Mirror Company and Virginia Glass Products, where she provided interior glazing, glass entrance and other glass products to retail, corporate and hospitality customers.



DuMont

A+W Software added *Korry DuMont* to its software team. DuMont assumes the role of customer service consultant, focusing on A+W Clarity customers. He brings IT knowledge, including of ERP and SQL server, say company officials, and will draw on years of experience in construction adjacent industries.

IN MEMORIAM



Little

Maurice “Newt” Newton Little passed away after a long battle with several health issues, according to his obituary. Little and his wife, Linda, founded **ACE Glass** in 1986. Their son, Courtney Little, purchased the business in 2008 and is now president and general counsel. His dedication to helping others in our industry was both foundational and inspirational. Little was always at the ready with a story and a smile. His son Courtney follows in his father’s footsteps, serving as a member of the current National Glass Association board of directors and is active in many NGA activities.



Albert

Stanley Myron Albert passed away at the age of 90. Albert was a longtime member of the glass industry, and founder of **S. Albert Glass**, a full-service glass company and contract glazier based in Beltsville, Maryland. The company is an NGA member company.

“He was such an important part of our lives and through his love, kindness, caring and always wanting what is best for his family that we loved him,” states Albert’s son, Michael, president of S. Albert and former NGA board member and two-term NGA board chair. “We will always wear the Albert name proudly.” ■

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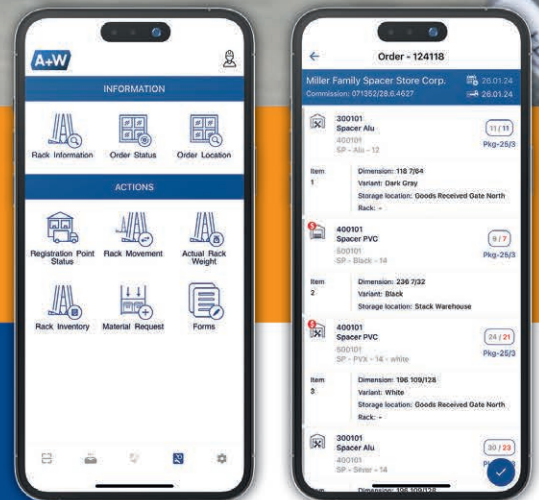
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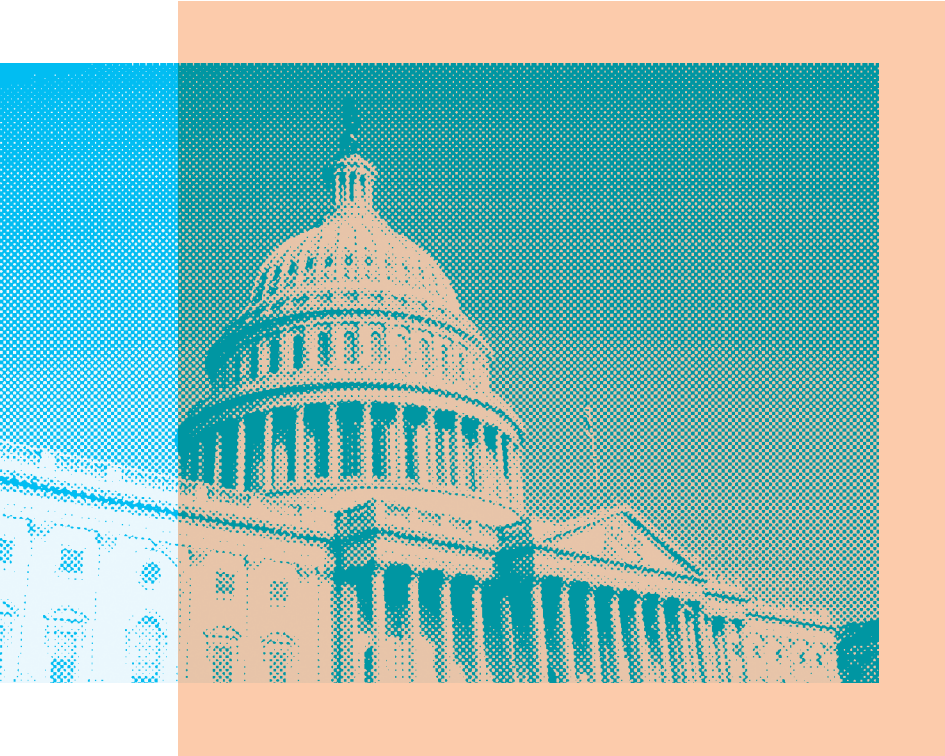


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GOVERNMENTAL CONTRACTING LESSONS

WHILE CHALLENGING, GOVERNMENTAL CONTRACTING CAN OFFER VALUE FOR GLAZING COMPANIES AND GLASS SUPPLIERS IN ALL MARKETS
BY MATT JOHNSON



Glass suppliers to the United States military have long known the challenges surrounding contracting for public entity supply. Each year, a new National Defense Authorization Act, or NDAA, approves policies and goals for supplying items to the military, and 2024 is no different. While the rules are specific to one kind of supply agreement, with a careful eye, the processes and goals can provide strategies for daily use at every level of the glazing industry.

Flexibility and scalability

The NDAA divides itself into sections that address different goals or processes. Section 809 directs a pilot program to implement an “anything-as-

a-service” computing model, which is directed at having computer hardware and software available on-demand to respond to the needs of a specific project, without large-term capital expenditures.

Glazing companies need flexibility and scalability as well. The specifications of a product, project or market segment can require capabilities that do not warrant a large capital cost to meet those needs. Outsourcing and temporary skilled-labor agreements can allow glaziers to compete in broader markets. Being prepared to address labor and material scaling on demand can provide opportunities and capabilities so that stretch projects are within reach.

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Supplier representations

Various sections of the NDAA prevent the Department of Defense from contracting with firms that provide services to certain adversarial countries and groups. Vendors and contracting parties must prepare country of origin disclosure and representations to meet this section. Violations or misrepresentations of those disclosures can result in contractual and criminal penalties.

Supplier representations are essential to glazing companies at multiple levels. Lifecycle and EPD representations prove crucial to LEED and contractual environmental goals. Material quality and compliance with ASTM methods for sealants, coatings, or strength can impact real-world product performance. Contracting strategies that ensure material compliance with representation, and address responsibility for failures, can provide crucial protections.

Specific temporary market conditions

Section 824 of the NDAA provides temporary measures to address the impact of inflation. This time-limited provision establishes a process to seek modification or reimbursement of costs due solely to economic inflation. Notably, however, there are no appropriations in the NDAA. So, while the process is spelled out, no monies are currently specified for that process.

From a project-contracting perspective, there are two takeaways from this section. Forward thinking at the time of contracting can anticipate particular market challenges, and setting out expected or process accommodations for those challenges can avoid later disputes. However, the absence of a remedy—here, money for the adjustment—makes the process less than ideal. Project modifications need a defined process and a meaningful remedy to have true value and protection.

Fixed-cost adjustment factors

Section 826 allows for the modification of a fixed-price contract. Where a contract price is set, the NDAA will allow certain Economic Price Adjustment terms—upward or downward—based on changes in price, labor or materials. These terms are intended to help address the inherent flexibility in those three market contingencies.

The ability to revisit a contract's value during performance can protect both the owner and the trade. Volatility in market conditions often can make the ultimate performance of an agreement disastrous for one side or the other. Contracting for general adjustments—as opposed to specific triggers like inflation—can provide protection where unanticipated costs effectively negate performance value.

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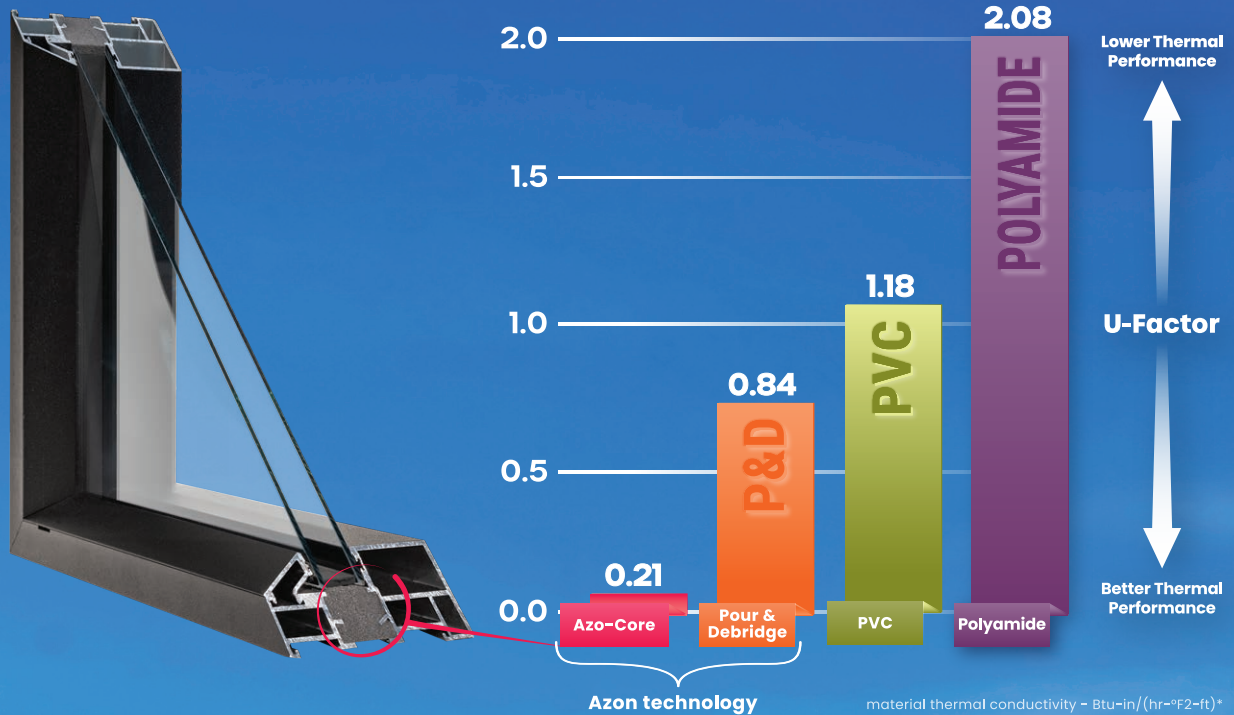
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Buy American Act

The term “Made in America” holds value and is essential in government contracting. Section 835 requires that manufactured articles in a major defense acquisition program meet domestic content requirements. With scaling, date-tiered obligations, the NDAA mandates that materials be made domestically—ultimately requiring that by Jan. 1, 2029, no less than 75% of the cost of a manufactured component must be within the U.S.

Knowing where materials are made can be challenging in the current economy. The effort to identify cost-component-based calculations is also challenging. It takes work to confirm these factors, document them, and prove compliance when challenged. This is true for “Made in America” or any market-facing representation about product compliance, performance or conditions. Early steps to develop

the evidence necessary to back up these representations can lead to confident contracting and allow more opportunities.

Loser pays

One item in the original 2024 NDAA draft that didn’t make it to the final enactment was a requirement that the loser of government bid contests pay the legal fees of both sides. In regular government contracting contests, each side is responsible for their own legal fees, which remains so in the current NDAA. The stated reasons for the condition’s removal were that the number of these challenges is relatively small and, ultimately, the term was not needed.

In trade contracting, however, prevailing party clauses and legal fee shifting are essential terms. Questions surrounding who pays in the event of a contest or claim can lead to bet-the-company decisions regarding litigation.

Addressing the scope of fee-shifting provisions at the time of contracting is a crucial risk management and mitigation task.

Governmental contracting can be challenging, and the NDAA’s requirements are varied and complex. Even so, the concepts and ideas reflected in these processes have applications well beyond public entity supply and can realize value for suppliers and trades in all markets. ■

Matt Johnson is a member of the Gary Law Group, a Portland-based firm specializing in legal and risk issues facing manufacturers of glazing products. He can be reached at matt@prgarylaw.com.

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SHAPING INTERIORS WITH CHANNEL GLASS

BLENDING AESTHETICS AND FUNCTIONALITY, CHANNEL GLASS IS AN ADAPTABLE AND DYNAMIC SOLUTION **BY DEVIN BOWMAN**



Outgrowing their purely aesthetic role, decorative glazing assemblies can now blend beauty and functionality in a wide range of designs. Of the many decorative glass options, channel glass has grown in popularity for its ability to create light-filled, sophisticated spaces rooted in elevating occupant experience.

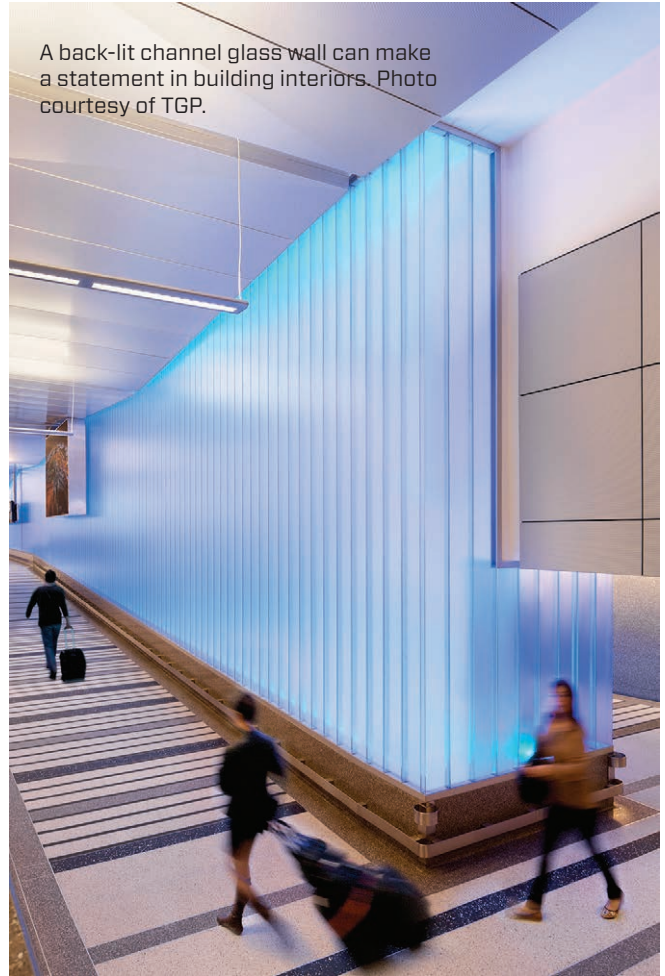
The linear, U-shaped, self-supporting cast glass channels are encased in an extruded metal perimeter frame, enabling single- and dual-glazed designs that cater to crucial aspects like daylighting, energy efficiency and privacy. By using channel glass, building teams can stay abreast of the latest design trends while also successfully balancing style and substance in contemporary interiors and exteriors.

Enhancing comfort

Channel glass diffuses generous amounts of soft, even, natural daylight for an elegant, modern look. Translucent cast glass channels prevent overly direct sunlight, as well as distracting shadows and heat buildup, while also mitigating glare. This, in turn, maximizes natural light while minimizing the need for blinds or windscreens, creating a cleaner aesthetic and enhancing the occupant experience.

Additionally, channel glass with low-emissivity and solar coating supports thermal efficiency. Linear glass segments can be installed to overlap and create an insulating dead-air-filled space between them. This arrangement has a relatively low solar heat gain coefficient, which can further be reduced by filling the air cavity with aerogel insulation. As the insulation is 90% air, the assembly remains translucent and continues to invite a high degree of natural light transfer.

A back-lit channel glass wall can make a statement in building interiors. Photo courtesy of TGP.



Eye-catching designs with dynamic configurations are possible with glass channels. Photo courtesy of TGP.

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Creating unique spaces

During the evening, channel glass can be backlit with strategically placed LED lights to accentuate a building’s features and provide subtle illumination. The system’s translucency allows for a glowing interior setup, used in well-lit corridors to improve usability and support wayfinding.

Additionally, unlike opaque materials, channel glass can highlight the silhouette of people walking on both sides. This benefit can be utilized to improve safety in educational settings and offices to create a safer, well-connected and functional building.

Balancing privacy

Just like lighting, balancing privacy and connectivity is crucial for shaping the user experience. With various color and texture options, channel glass facilitates design exploration while addressing privacy.

Channel glass variants offer several levels of translucency, obscuring direct vision while dispersing light. For instance, uncoated double-glazed applications offer a visible light transmittance of 70% to 75%, maximizing both natural light and visibility. In contrast, sandblasting channel glass enhances privacy while maintaining access to daylight, making it an ideal choice for areas such as bathrooms and office lounges. Additionally, channel glass assemblies can provide premium sound insulation with Sound Transmission Class ratings up to 44, contributing to a more comfortable user experience.

Sparking creativity

While supporting occupant experiences, channel glass can push creative boundaries with horizontal, vertical, raked and curved configurations. It can extend vertically up to 13 feet or horizontally up to 23 feet without additional framing

members. Channel glass can also be stacked over a floor plate to achieve greater glazing expanses. In addition to linear configurations, glass channels can achieve designs with radii as tight as 6.2 feet, enabling curved and serpentine wall partitions.

Translating design visions

The choice of glass in a building plays a pivotal role in shaping not just the ambiance but also the user experience. Within this realm, channel glass continues to be an adaptable and dynamic solution. It helps champion sophisticated and visually impactful spaces accentuated with diffused natural light, privacy, energy efficiency and acoustic requirements. ■

Devin Bowman is general manager of Technical Glass Products and AD Systems.

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THE BASICS

As the only public art program devoted to schools in the entire nation, Public Art for Public Schools, or PAPS, functions as a unit within the New York City School Construction Authority, overseeing the creation of site-specific projects for newly built schools. It also manages the preservation of nearly 2,000 existing artworks in the NYC Department of Education's collection throughout the five boroughs. PAPS' mission is to enrich students' learning environments by equipping schools with artwork to elevate, educate and inspire.

THE DESIGN

Artist Justin Kim created this playful mural for The Alley Pond School in Bayside, Queens, as a project for the PAPS initiative. The mural's glass surface depicts different individuals engaged in various activities such as reading books, playing the violin and shooting basketballs. The artwork serves as a constant reminder to the students that they are capable of pursuing whatever they want, anywhere in the world. The mural also showcases iconic city landmarks, including the historic Queensboro Bridge, which connects Manhattan and Queens. The bold contrast between the bright orange and vivid blue tones creates a lively and welcoming entryway for students, staff and visitors.

THE MATERIALS

For this project, Pulp Studio supplied seven panels of glass, using 9/16-inch D2G™ Custom Graphic Tempered Glass measuring 70-3/4-inches tall to illustrate the graphics. D2G is a direct-to-glass digitally printed image that uses ceramic inks fired onto the surface of the glass. The process for printing on glass is highly complex due to many factors uncommon in conventional printing like transparency or translucency, white ink and size, making it a difficult practice that requires extreme attention to detail. Throughout this process, Pulp exquisitely printed the unique, vibrant artwork onto each glass panel.

Learn more at pulpstudio.com, 310/815-4999. ■



Kalwall products appear across the U.S., from the Apple Campus headquarters in Cupertino, California, and the Wolfe Center for the Arts in Bowling Green, Ohio, to the New York Hall of Science in Queens, New York, and the Yale Sculpture Building in New Haven, Connecticut. Their products can be found in schools, museums, hospitals, churches, sports stadiums, airports and even the iconic NASA Vehicle Assembly Building at Kennedy Space Center in Florida.

SHINING A LIGHT ON INNOVATION

TRANSLUCENT DAYLIGHTING SOLUTIONS PROMOTE HUMAN-CENTERED DESIGN FOR HEALTHY AND SUSTAINABLE BUILDINGS **BY TARA LUKASIK**

Kalwall Corp., founded in 1955 by inventor Robert R. Keller Sr., stands as a beacon of innovation in the realm of translucent daylighting systems. For nearly 70 years, Kalwall has been at the forefront of providing museum-quality daylighting solutions that cater to diverse architectural projects. From wall and window systems to skylights and façades, Kalwall's offerings are designed to meet every need of a daylighting project, marrying functionality with aesthetic appeal.

At the heart of Kalwall's ethos lies a commitment to human-centered design. Guided by a mission to make the world a better place—one healthy, daylight building at a time—Kalwall emphasizes the profound impact of natural light on human well-being. With a focus on promoting sustainability, reducing carbon footprints, manufacturing safe and

resilient materials, and energy efficiency in an evolving climate, Kalwall's dedication to holistic design shines through in every facet of its operations.

The legacy of its founder echoes through Kalwall's journey. A lifelong inventor inspired by the marvels of flight, Keller's ingenuity led to the development of the iconic Kalwall insulated, light-transmitting technology, revolutionizing the architectural landscape worldwide. From the iconic U.S. Pavilion at the 1958 Brussels World's Fair to contemporary landmarks like the Apple Campus headquarters, Kalwall's footprint spans across diverse architectural marvels, testament to its enduring legacy of innovation and excellence. As Kalwall nears its 70th year celebration, its mission remains unwavering: to illuminate spaces with the transformative power of daylight, enriching lives and shaping a brighter future for generations to come.

I recently sat down with Samuel Keller, vice president of product development, and one of the five grandchildren of founder Robert R. Keller Sr. working at Kalwall, to discuss the company's approach to distinguishing themselves in the industry through innovative technology, extensive customization options, and a commitment to quality and sustainability.

How has Kalwall evolved over the years, and what sets it apart?

We pride ourselves on being the market leader in high-performance translucent daylighting. We can claim many industry firsts over the years, but our core competence is still essentially the same. Kalwall offers a versatile, mass-customizable, daylighting system that can be tailored to meet a wide variety of project needs. Everything we do is built to specifications because no two buildings are the same. In the end, I think what sets us apart is our reputation as an innovator, Kalwall's brand awareness among AEC professionals, and our track record of delivering product on time and on budget.

We have a broad reach, a network of trusted distributors and installers, and other strategic advantages that we have honed over time. That matters a lot but, even more so, we offer a useful and timely building technology that solves real problems and performs well over the long term. All buildings benefit from well-designed, naturally daylit spaces, but the ultimate Kalwall differentiator is the light quality our systems produce. We transmit full visible spectrum daylight and diffuse it completely for well-lit, glare-free, interior spaces.

The movement toward daylighting, energy efficiency and thermal performance are still leading architectural design. How are you addressing these trends?

Our 175CW translucent insulated glazing unit, or TIGU, is a new solu-

tion that makes it easier to design with Kalwall for façade applications. We live in a glass and aluminum-dominated world, and in many cases, designers have already specified their curtain wall or storefront system and they're evaluating glazing options separately. Kalwall 175CW is our effort to provide a high-performance, translucent glazing that integrates seamlessly into more of those framing systems. These 1-3/4-inch-deep TIGUs were developed to match triple-pane IGU thicknesses, compatible with most thermally improved curtain wall systems available.

What specific features or technologies differentiate it from existing products?

Our mission is to bring balanced, natural daylight into more buildings, and this new solution makes doing so much easier. While this kind of curtain wall integration option is new for us and for the designers and specifiers we work with, we can now offer the added convenience and suitability for more projects. There are so many projects where designers and specifiers are looking to mix and match glazing materials into the same framing system. With 175CW, coordination and integration are greatly simplified, making it virtually 'plug and play' for designers and installers. We want to make all our products easy to work with, and the offered advantages so compelling, that they are hard to ignore.

Can you describe the design and development process involved, any challenges?

It was interesting. The product development challenge here was to take an inch of thickness out of our standard 2-3/4-inch Kalwall panel without losing a third of the properties we're known for. We worked hard to optimize both the glazing performance—visible light transmittance, U-factor and solar heat gain coefficient—and the strength-

to-weight of the product to perform well in a variety of four-sided capture, curtain wall systems. In the end, we achieved values that are very close to the thermal performance and solar control associated with our thicker 2-3/4-inch and 4-inch panels making the 175CW a glazing option for any low- to mid-rise building in North America.

Are there specific industry challenges that you believe deserve more attention?

Our main challenges are getting more people to consider translucency instead of, or alongside, transparent materials like vision glazing, and for more design professionals to understand the science of daylighting to deliver and manage natural light within buildings. Transparency is great for providing views and visual connection, but translucency is better for producing quality daylight.

What developments can we expect from Kalwall in terms of daylighting solutions?

We have several areas of ongoing R&D, and are developing more versions of TIGU products. We're also looking at building-integrated photovoltaics for power generation, daylight harvesting optimization with dynamic glazing technologies, and reducing embodied carbon and planning for end of life, among others.

The building envelope acts as a kind of second skin, and we increasingly spend our days inside, so there will continue to be more innovation that will further optimize building performance, minimize environmental impacts, and prioritize human-centered design solutions that support people living, working, learning and playing in the built environment every day. ■

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LINE. PHOTO BY ADAM
MITCHELL.

GLASS

TOP

FABRICATORS

LEADING FABRICATORS WITHSTAND THE
FALLOUT FROM INFLATION AND A
CHANGING ECONOMIC LANDSCAPE

BY NORAH DICK

Leading glass fabricators report a year of solid investment and innovation, as well as strong sales. Companies also report slower growth, likely due to construction-wide issues with inflation, project delays and resulting cost increases.

Merger and acquisition activity early in 2024 suggests that the construction landscape will continue to change and consolidate. In February, Oldcastle BuildingEnvelope acquired Midwest Glass Fabricators, headquartered in Highland, Michigan. In March, Trulite Glass & Aluminum Solutions finalized the acquisition and merger of American Insulated Glass. Additionally, Gardner Glass Products was acquired by a private equity firm, Ironbridge, which also owns Walker Glass Co.

44 . THE LIST
60 . PRODUCTS
62 . INVESTMENT
64 . SALES AND CHALLENGES

Challenges with raw glass sourcing did appear to ease in 2023, but hurdles remain, even for the country's top fabricators. "The cost of domestic float glass has increased significantly, and that poses pricing and competitive bid challenges," says Adam Shearer, president and partner, Imagic Glass. According to the U.S. Bureau of Labor Statistics, material pricing (measured through the Producer Price Index) for glass and glass products increased 4.6% during 2023, and was up 23% compared to pre-pandemic.

Though attendant challenges like supply chain seem to have eased, paused projects threaten a negative cascading effect on the industry. "Many projects have been delayed, which has an impact on supply chain management," says Carey Mobius, president and CEO, Garibaldi Glass Industries. "Staffing resources have been difficult to maintain, and as a result, there has been instability in overall manufacturing."

Find the industry ranking for Top Glass Fabricators on pages 44-58, which features leading glass fabricators that supply the North American market. To see more information on fabricator product types and locations, purchase the Fabricator Database at glass.org/store.

This report also features data and analysis compiled from survey responses contributed by most Top Glass Fabricators. To learn about fabricator products and design trends, see pages 60-61. To read about manufacturing innovation and capital investment, go to pages 62-63. Learn about how industry sales have grown, as well as the challenges restricting growth, on pages 64-65.

THE LIST



The 67 companies that comprise the 2024 Top Glass Fabricators ranking represent some of the foremost glass fabricators in this industry. Businesses that are part of this ranking must fabricate architectural glass, supply the North American market, and have gross sales that equal or exceed \$5 million. Do you feel your company belongs on the list? Contact Norah Dick, senior editor of Glass Magazine, at ndick@glass.org.

OVER 1 BILLION

01

Oldcastle BuildingEnvelope

obe.com
Dallas, TX
Plants: 85
Employees: 6,700

300-900 MILLION

02

Tecnoglass

tecnoglass.com
Miami, FL
Plants: 6
Employees: 9,000



See the projects and behind-the-scenes factory shots of leading fabricators.



The multi-award-winning Morrow High School designed by Perkins+Will showcases multiple glass applications fabricated by American Insulated Glass (acquired by Trulite in March 2024), including the SunGuard eXtraSelective SNX 51/23 specified for the building façade. Photo by Jonathan Hillyer.

100-300 MILLION

03

Trulite
trulite.com
Peachtree City, GA
Plants: 32
Employees: 2,200

04

Viracon Inc.
viracon.com
Owatonna, MN
Plants: 1
Employees: 1,500

05

PRL Glass Systems Inc.
prlglass.com
City of Industry, CA
Plants: 4
Employees: 600

06

Aldora Glass
aldoraglass.com
Coral Springs, FL
Plants: 7
Employees: 535

THE LIST



Modern glass designs contribute to the stunning lobby of the George H.W. Bush State Office Building, including a feature wall that pays tribute to the 41st President through historical images recreated on glass by GGI with their Alice Direct to Glass Printing. Photo by Color Kote.

50-100 MILLION

13

Tristar Glass Inc.
 tristarglass.com
 Catoosa, OK
 Plants: 3
 Employees: 235

14

Glassfab Tempering Services
 glassfabusa.com
 Tracy, CA
 Plants: 4
 Employees: 315

15

Press Glass Inc.
 pressglass.us
 Stoneville, NC
 Plants: 2
 Employees: 535

16

Grupo Tecnovidrio
 grupotecnovidrio.com
 Mexico City, Mexico
 Plants: 5
 Employees: 900

17

Dreamwalls by Gardner Glass
 dreamwalls.com
 North Wilkesboro, NC
 Plants: 2
 Employees: 300

07

Prelco Group
 prelco.ca
 Riviere-du-Loup, Quebec,
 Canada
 Plants: 6
 Employees: 627

09

American Insulated Glass**
 aiglass.com
 Conley, GA
 Plants: 7
 Employees: 500
**AIG was acquired by Trulite in March 2024

10/11

Vitrum Glass Group
 vitrum.ca
 Langley, British Columbia,
 Canada
 Plants: 2
 Employees: 400

08

Glasswerks LA
 glasswerks.com
 South Gate, CA
 Plants: 5
 Employees: 600

10/11

Basco Shower Door
 bascoshowerdoor.com
 Mason, OH
 Plants: 4
 Employees: 500

12

Hartung Glass Industries*
 hartung-glass.com
 Tukwila, WA
 Plants: 9
 Employees: 1,000

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THE LIST



Employees at the factory of Tvitec | Cricursa in Cubillos de Sil in León-Spain prepare to handle a glass lite over 29 feet in length. The suction cups on the glass handling equipment can move pieces weighing more than 5 tons. Photo courtesy of Roberto Arias, Tvitec | Cricursa.



18 _____ 21/22/23 _____

Safti First Fire Rated Glazing Solutions

safti.com
Brisbane, CA
Plants: 4
Employees: 250

McGrory Glass

mcgrory.com
Paulsboro, NJ
Plants: 3
Employees: 153

30-50 MILLION

19 _____

Garibaldi Glass Industries Inc.

garibaldiglass.com
Burnaby, British Columbia,
Canada
Plants: 1
Employees: 242

24 _____

**Isoclima Specialty Glass/
Global Security Glazing**

isoclimasg.com
Butler, PA
Plants: 2
Employees: 250

20 _____

Glaz-Tech Industries Inc.

glaztech.com
Tucson, AZ
Plants: 8
Employees: 260

25 _____

**AGC Interpane Architectural
Glass**

interpane.com
Plattling, Germany
Plants: 2
Employees: 500

21/22/23 _____

Blue Star Architectural Glass

bluestarglass.net
North Brunswick, NJ
Plants: 2
Employees: 145

26 _____

Tvitec | Cricursa

tvitecglass.com | cricursa.com
Cubillos del Sil, Spain
Plants: 9
Employees: 700

21/22/23 _____

**General Glass International
(GGI)**

generalglass.com
Secaucus, NJ
Plants: 1
Employees: 200

27 _____

Insulite Glass Co.

insuliteglass.com
Olathe, KS
Plants: 2
Employees: 185

THE LIST



Designer Jocelyn Chiappone of DIGS specified the custom glass color for the beachside Break Hotel Narragansett. Dillmeier Glass supplied the glass, and additional backpainted glass for each hotel room bathroom.

28 / 29

Custom Glass Products
customglassproductswi.com
Schofield, WI
Plants: 3
Employees: 220

28 / 29

Glass and Metal Craft
glassandmetalcraft.com
Wixom, MI
Plants: 2
Employees: 140

30

Dillmeier Glass Co.
dillmeierglass.com
Van Buren, AR
Plants: 1
Employees: 150

31

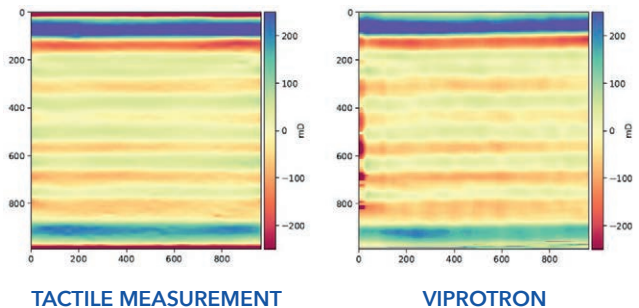
Midwest Glass Fabricators Inc.
mwgf.com
Highland, MI
Plants: 1
Employees: 195

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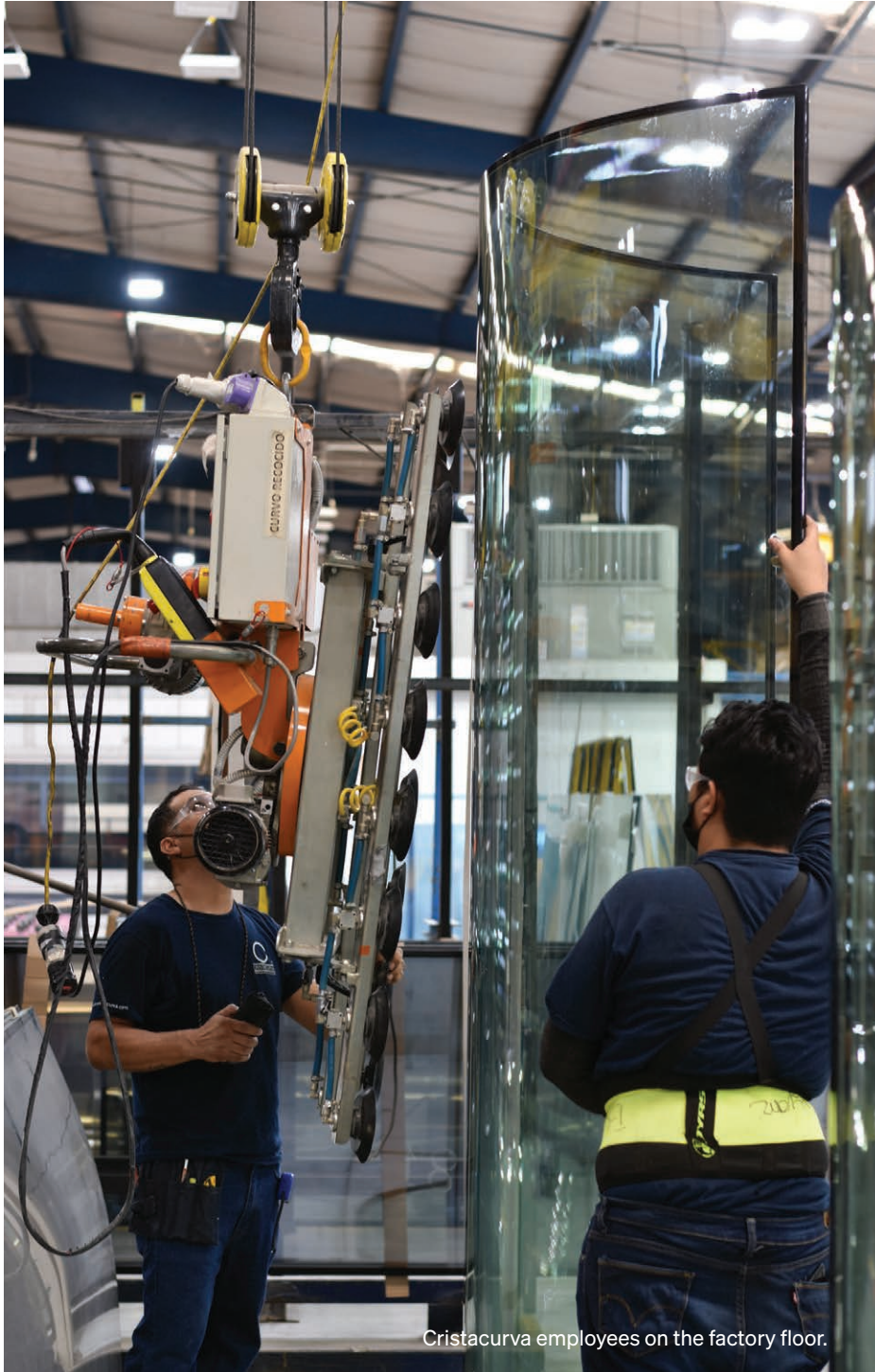
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www.viprotron.com

THE LIST



Cristacurva employees on the factory floor.

32 _____

Paragon Tempered Glass
paragontemperedglass.com
Antwerp, OH
Plants: 2
Employees: 175

33 _____

High Performance Glazing Inc.
hpglazing.com
Toronto, Ontario, Canada
Plants: 1
Employees: 52

34 _____

Splendor Glass
splendorglass.com
Holland, OH
Plants: 1
Employees: 110

35 _____

Action Bullet Resistant Inc.
actionbullet.com
West Islip, NY
Plants: 1
Employees: 62

36 _____

Laurier Architectural Inc.
laurier.net
Laurier Station, Quebec,
Canada
Plants: 1
Employees: 175



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Image © Kuraray



"Setting the standard for structural interlayers for over 25 years."

kuraray

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THE LIST



All Weather Windows Glass employees inspect glass after it has gone through high performance glass cleaning system.

10-30 MILLION

37 _____

Glass Enterprises Inc.

geiglass.com
Bensalem, PA
Plants: 2
Employees: 100

39 _____

Cristacurva

cristacurva.com
Houston, TX
Plants: 2
Employees: 250

41 _____

AGNORA

agnora.com
Collingwood, Ontario, Canada
Plants: 1
Employees: 84

43 _____

Southern Wholesale Glass

swgcareers.com
Americus, GA
Plants: 1
Employees: 100

38 _____

M3 Glass

m3glass.com
Irving, TX
Plants: 2
Employees: 110

40 _____

GlasPro Inc.

glas-pro.com
Santa Fe Springs, CA
Plants: 1
Employees: 100

42 _____

Ballistic Glass and Armor Solutions

ballisticglassandarmor.com
Addison, TX
Plants: 1
Employees: 25

44 _____

Northwestern Glass Fab

northwesternglassfab.com
Fridley, MN
Plants: 1
Employees: 200

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✓ full integration



✓ ease of use



✓ special applications



✓ automatic glass measurement



✓ increased productivity

THE LIST

Grup Tecnovidrio supplied jumbo sized insulating glass systems with silkscreen printing to this mixed-used development with office and retail space located in Mexico City, Polanco. Photo by GD Iván Toledano.



45 _____

Maryland Glass & Mirror
mdglass.net
Baltimore, MD
Plants: 1
Employees: 51

46 _____

Skyline Design
skydesign.com
Chicago, IL
Plants: 1
Employees: 85

47 _____

All Weather Windows Glass
awcommercialglass.com
Edmonton, Alberta, Canada
Plants: 1
Employees: 79

48 _____

Precision Glass Bending Corp.
e-bentglass.com
Greenwood, AR
Plants: 1
Employees: 75

49 _____

Eastern Glass Resources Inc.
eglassr.com
Harrison, NJ
Plants: 1
Employees: 75

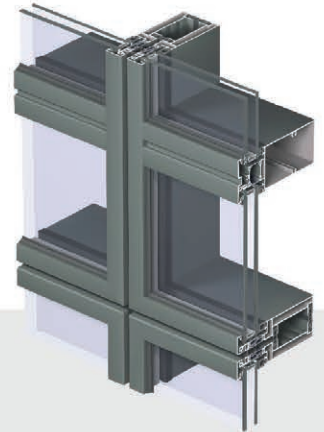


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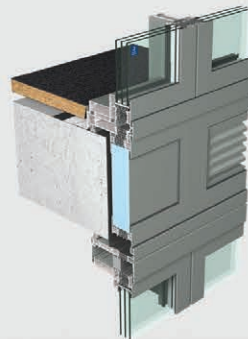
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+1(347) 625-0121
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THE LIST

50 _____
Kensington Glass Arts
 kensingtonglass.com
 Ijamsville, MD
 Plants: 2
 Employees: 90

55 _____
Lucky's Glass
 luckysglass.com
 Lawndale, CA
 Plants: 2
 Employees: 24

60 _____
Adriatic Glass & Mirrors Ltd.
 adriaticglass.com
 Concord, Ontario, Canada
 Plants: 1
 Employees: 52

65 _____
GlassTemp Inc.
 glasstemp.com
 Bellwood, IL
 Plants: 1
 Employees: 35

51 _____
Over the Mountain Glass
 otmglass.com
 Bessemer, AL
 Plants: 2
 Employees: 50

56 _____
RGT Glass America
 glassrgt.com
 Saddle Brook, NJ
 Plants: 1
 Employees: 32

61 _____
William Penn Performance Glass
 willpennglass.com
 York, PA
 Plants: 1
 Employees: 40

66 _____
Vitralum Glass Solutions Inc.
 vitralum.glass
 Altamonte Springs, FL
 Plants: 1
 Employees: 40

52 _____
InKan Ltd.
 inkan.ca
 Brampton, Ontario, Canada
 Plants: 2
 Employees: 70

57 _____
Elivate America Corp.
 elivateamerica.com
 Las Vegas, NV
 Plants: 1
 Employees: 15

62 _____
Northwest Glass & Mirror Inc.
 nw-glass.com
 Houston, TX
 Plants: 1
 Employees: 60

67 _____
Ardic Cam Sanayi AS
 ardiccam.com.tr
 Ankara, Turkey
 Plants: 2
 Employees: 320

53 _____
Bendheim*
 bendheim.com
 Wayne, NJ
 Plants: 1
 Employees: 85-90

58 _____
XYG North America
 xygna.com
 Hong Kong, China
 Plants: 11
 Employees: 16,000

63 _____
Dundy Glass & Mirror
 dundyglass.com
 Queens, NY
 Plants: 2
 Employees: 16



See the projects and behind-the-scenes factory shots of leading fabricators.

5-10 MILLION

54 _____
Tempco Glass Fabrication LLC
 tempcoglass.com
 Flushing, NY
 Plants: 1
 Employees: 60

59 _____
Imagic Glass Inc.
 imagicglass.com
 Toronto, Ontario, Canada
 Plants: 1
 Employees: 35

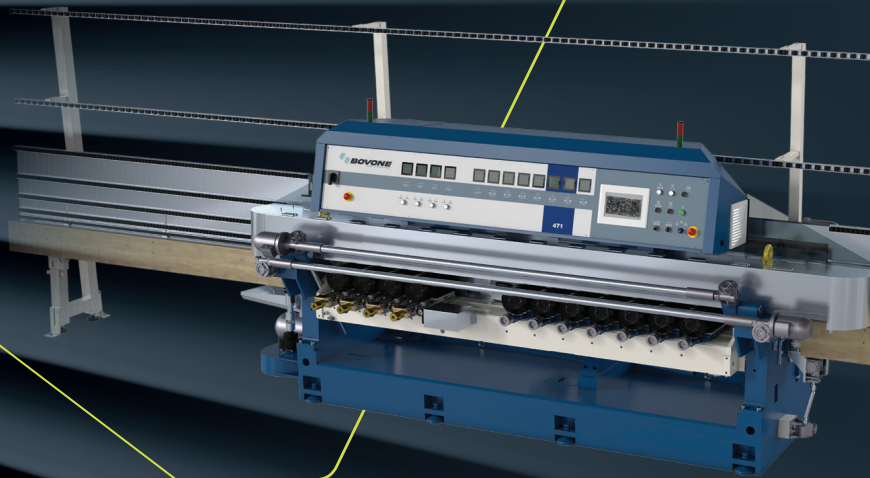
64 _____
Privacy Glass Solutions
 privacyglasssolutions.com
 Coral Springs, FL
 Plants: 1
 Employees: 48

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ASSISTANCE & SPARE PARTS

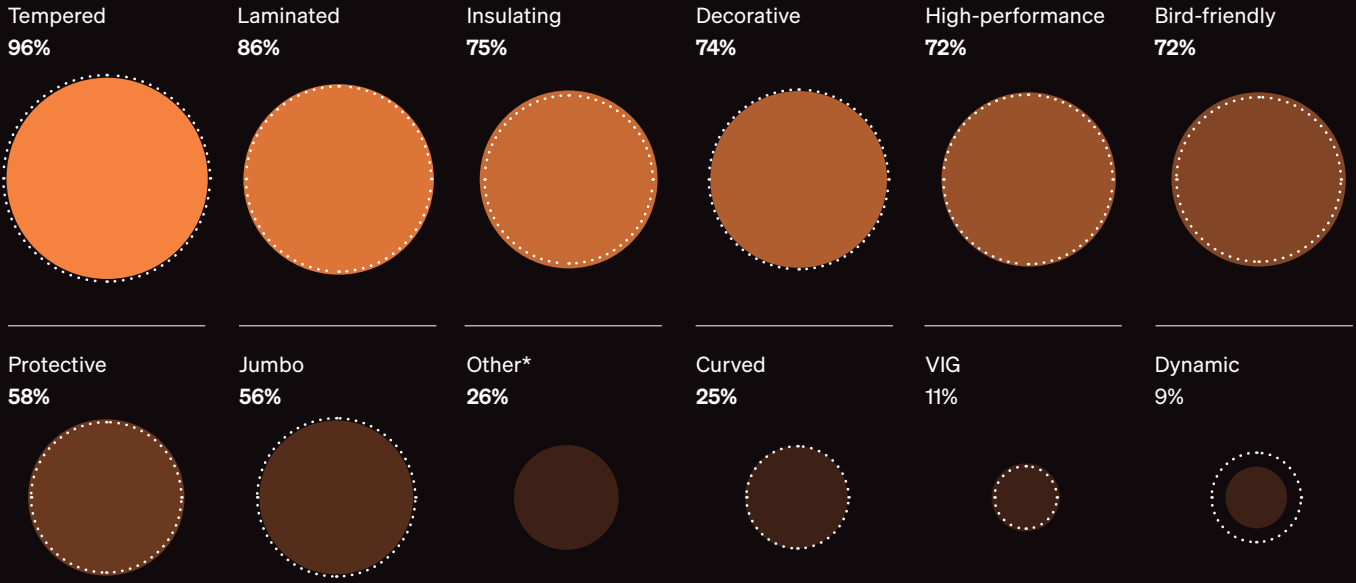
bovonenorthamerica.com

 **BOVONE**
NORTH AMERICA

PRODUCTS

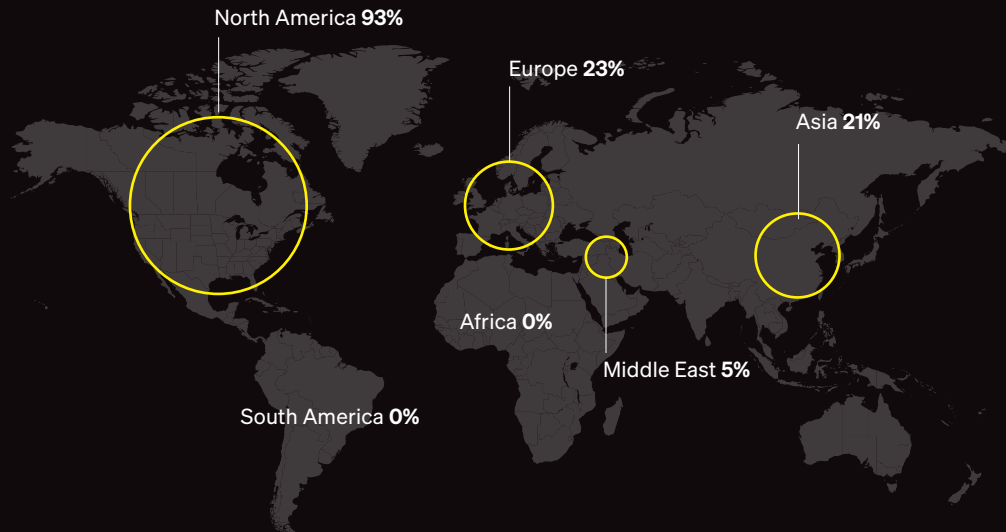
THE GLASS TYPES FABRICATORS SUPPLY

2023 2022

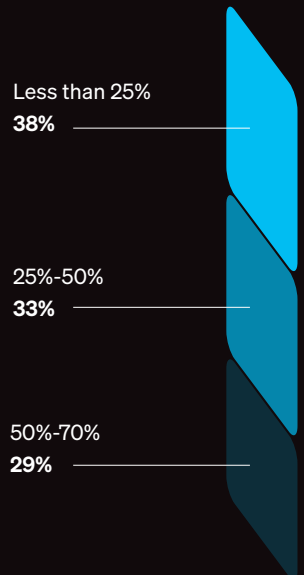


*Digital print, self-cleaning, custom shower enclosures, fire-rated glass, security glass, spandrel, mirror, bullet-resistant

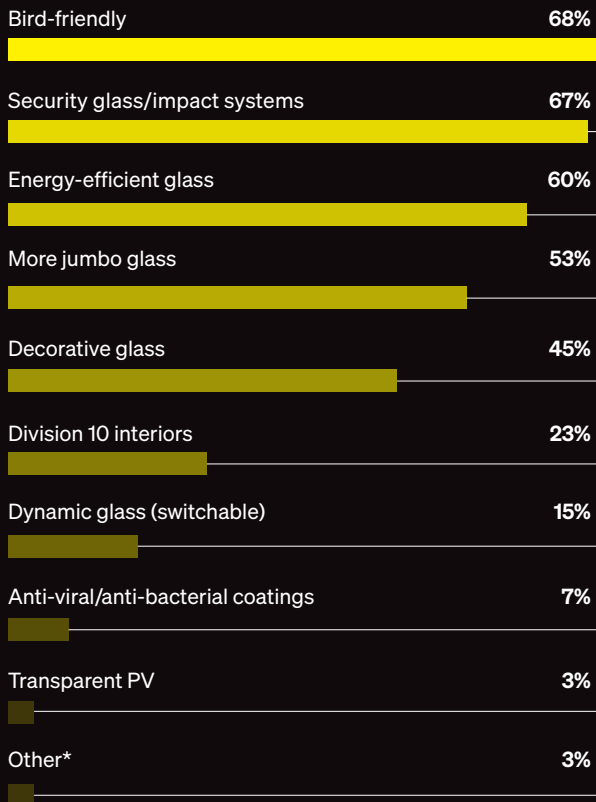
WHERE RESPONDENTS PURCHASED RAW GLASS IN 2023.



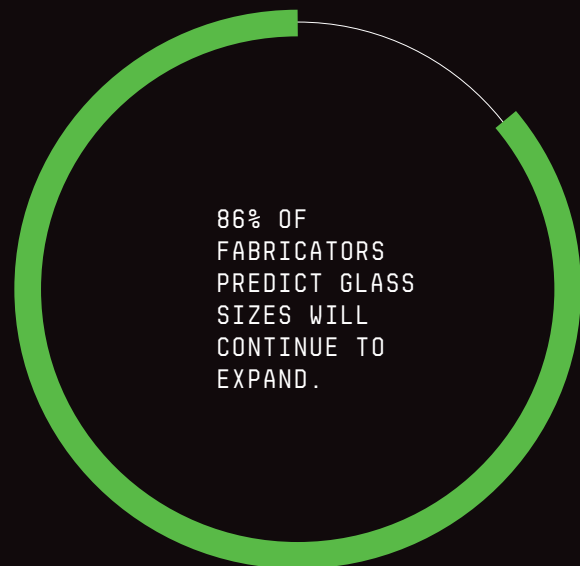
WHAT PERCENTAGE OF YOUR BUSINESS IS RETROFIT?



THE MOST POPULAR DESIGN TRENDS



*Digital printing, biophilic design, public art



T

he glass industry continues to expand its innovative products. Fabricator respondents reported increased production of several high-performance glass types, especially bird-friendly glazing. A majority, 72%, of respondents say they fabricated bird-friendly glass in 2023, a year-over-year increase of six percentage points; 68% of respondents also said they felt bird-friendly glass was a popular design trend. This is unsurprising given the amount of new codes and legislation across the country that are pushing for bird-friendly building solutions.

Security and impact-rated glass, as well as energy-efficient products, were close seconds in popularity this last year; 67% of respondents said security glass was a trend, and 60% named energy-efficient glass.

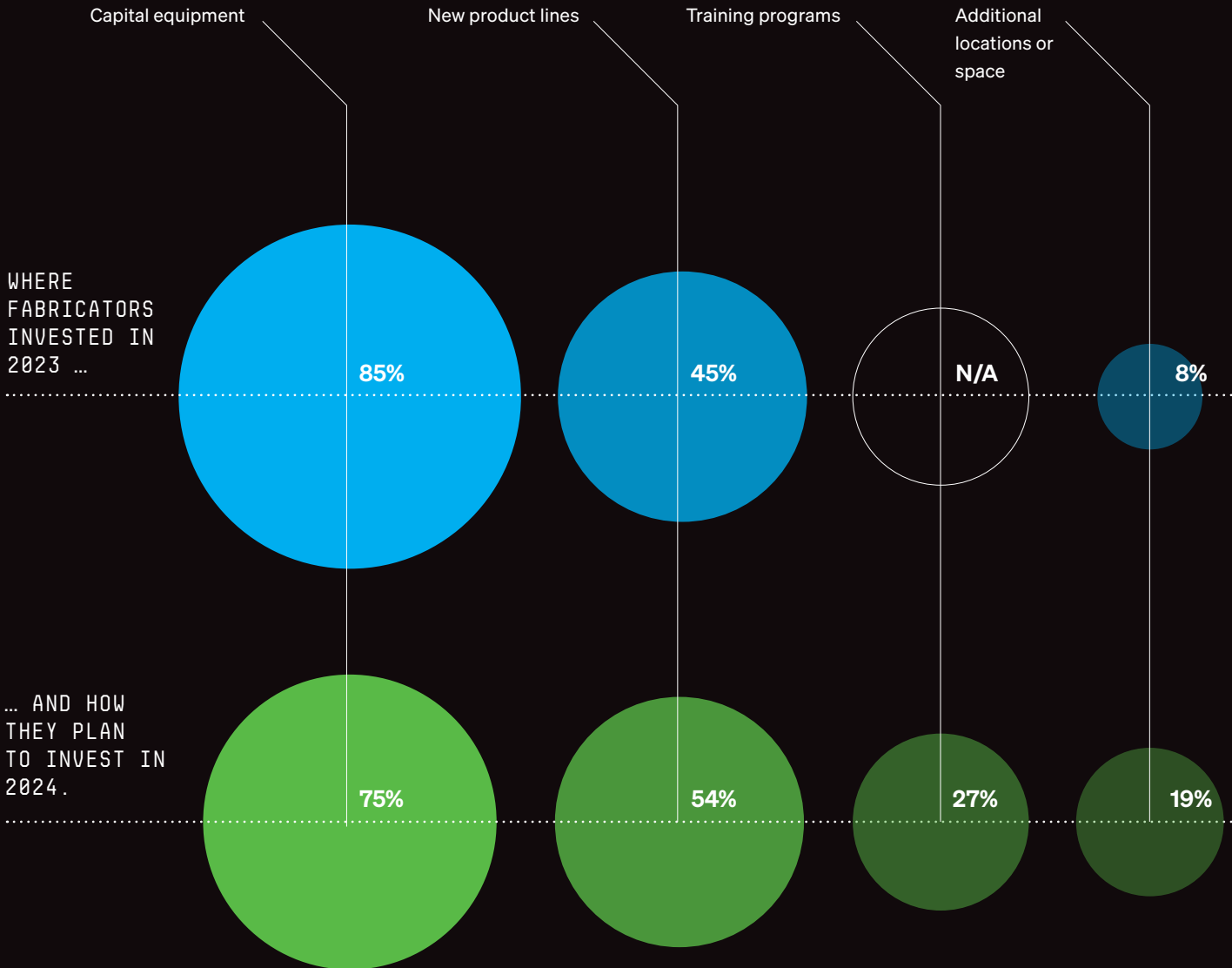
Regarding glass sizes, 86% of respondents expect sizes to continue to grow in 2024, up seven points from last year. Despite this, the number of companies that report making jumbo glass is down a few

percentage points for 2023, though this may be due to the lack of an industry standard definition of what constitutes jumbo glass.

Companies report doing more retrofit work in 2023, possibly due to economic uncertainty and project pauses, or other market factors. This includes higher interest rates prompting more people to renovate rather than buy new, or sustainable building trends urging more renovation. Seven percent of last year's respondents said retrofit work comprised 50% or more of their work; this year, almost a third said that retrofit represented half or more of their business projects.

Companies continue to procure raw glass primarily from North America, with Europe and Asia as distant seconds. As noted later in the report, respondents say that procuring raw glass eased significantly in 2023; this year, only 5% of respondents named it a major challenge, compared to 30% in 2022.

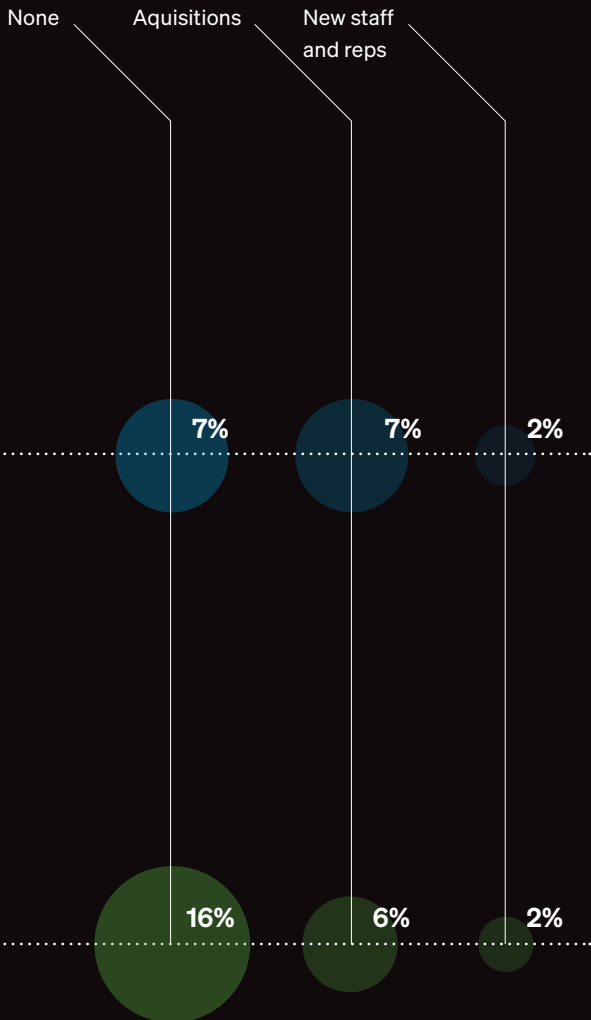
INVESTMENT



Companies largely did what they planned to do in terms of investment in 2023, investing in fabrication equipment and launching new product lines. Eighty-five percent of respondents said they invested in equipment in 2023, surpassing the 81% of respondents who said they planned to do so in last year's report. Forty-five percent of companies said they launched new product lines in 2023,

compared to the 46% of companies that reportedly planned to in the 2023 report.

Overall, 78% of responding companies said they added some type of production capacity in 2023, down almost 10 points from the previous year; possibly due to the continued difficulty with inflation reported by respondents. While 18% of respondents said they would add locations and/or manufacturing space in last year's report, only 8% of this year's respondents report doing so.

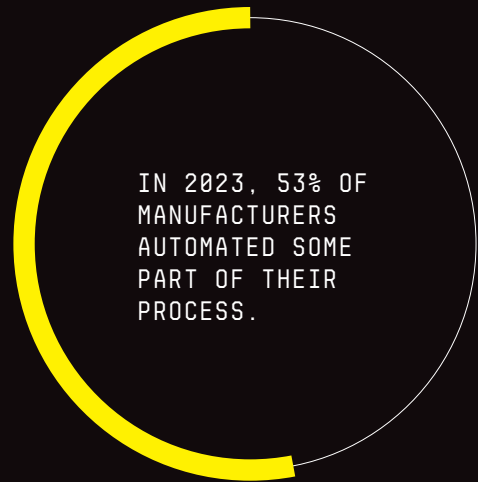


Further automation, and plans to automate, are down year-over-year. While 65% of respondents last year said they automated manufacturing processes, only 53% of this year's respondents report having automated processes in 2023. While 66% of last year's respondents planned to automate, 56% of this year's respondents say they plan to do so in the coming year.

Equipment purchases and new product launches again top investment plans for 2024, according to respondents.

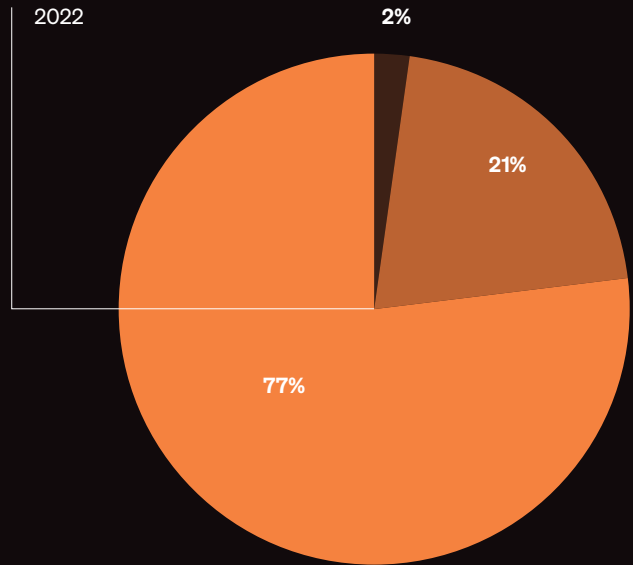
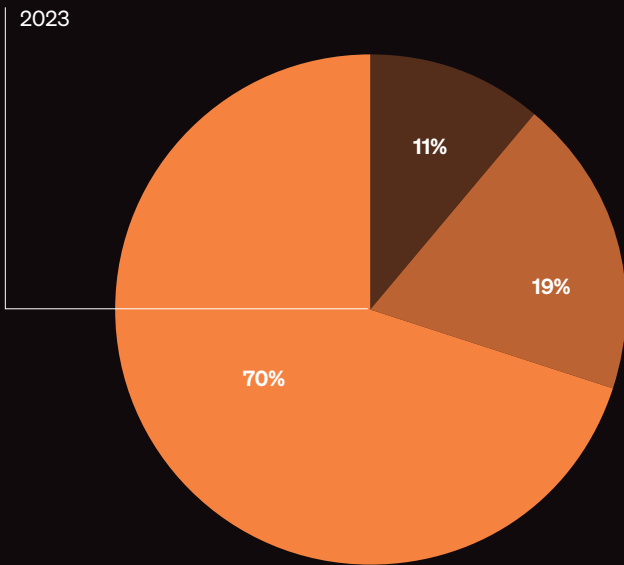
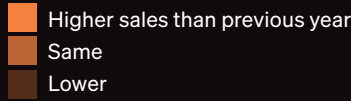
78%

OF FABRICATORS ADDED PRODUCTION CAPACITY IN 2023.



SALES AND CHALLENGES

SALES REMAIN HIGH, BUT GROWTH SLOWED IN 2023.



Overall gross sales increased for most companies in 2023. Seventy percent of reporting companies said they had higher year-over-year sales, compared to 77% in last year's report. More companies, 11%, did report lower year-over-year sales, compared to 2% last year.

Inflation remained a major pain point in 2023, and a likely obstacle to increased sales; 46% named it their major issue, compared to 37% the previous year. Respondents indicated that inflation and interest rates have had, and could continue to have, a negative impact on the whole industry and impact further growth.

"The economic fallout of higher interest rates have affected planned construction in the building markets," says Alex Miramontez, vice president and chief financial officer, Glaz-Tech Industries Inc. "Inflation in raw materials have hurt, and as we pivot

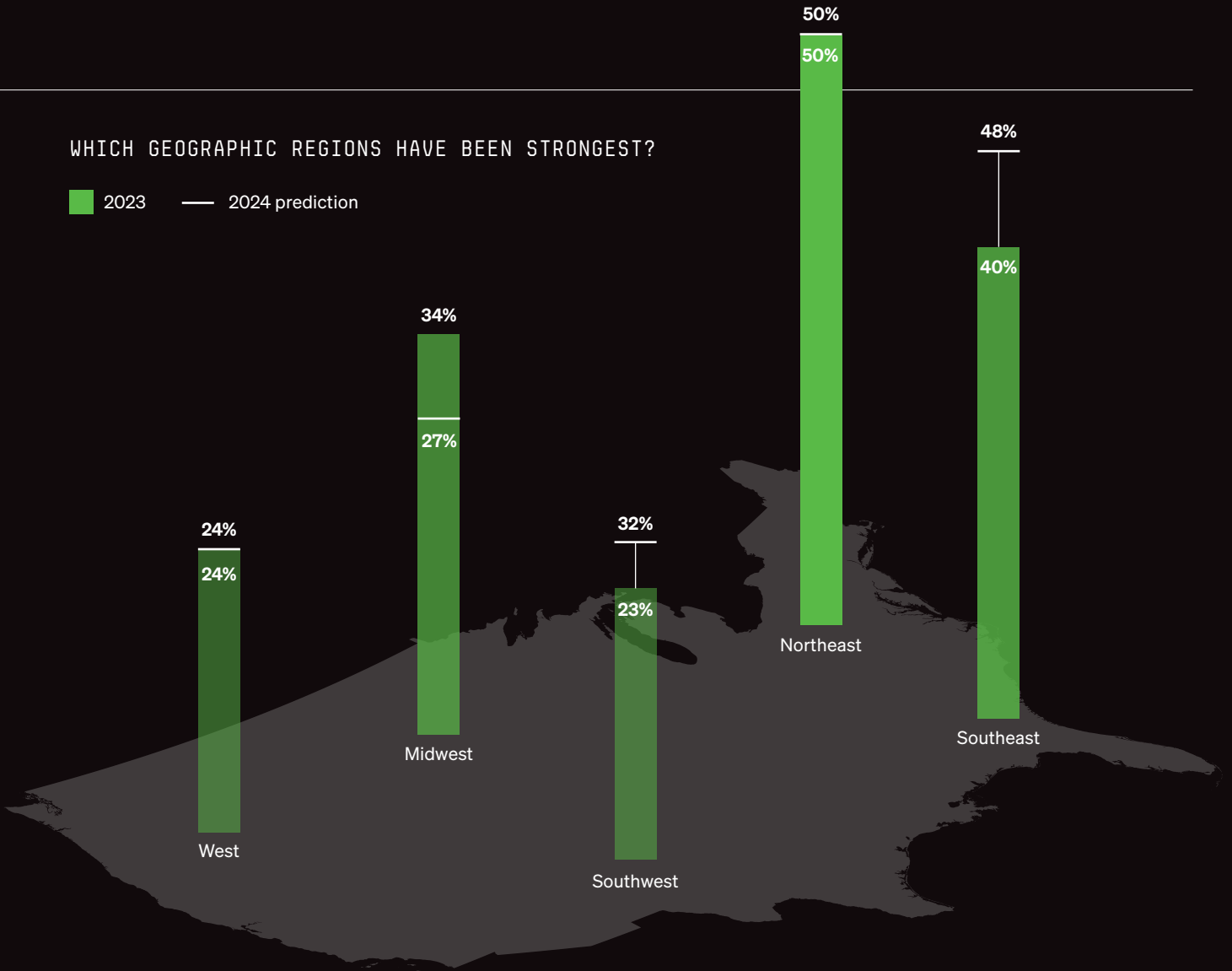
into new markets, it's hard to increase pricing for our legacy project business, so we have to eat that cost," says Kevin Roth, founder and CEO, Privacy Glass Solutions.

Logistics and transportation remained as much a sore point last year as in the previous report, according to respondents. "Logistics challenges can be attributed to factors such as transportation costs, customs regulations and potential delays at borders," says Amanda Gonzalez, PR and communications manager, Tecnoglass.

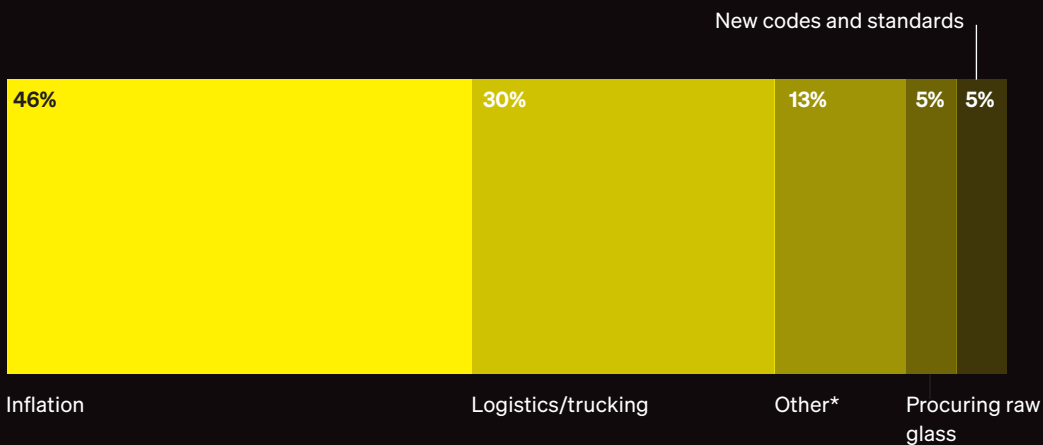
By geographic region, construction growth evolved similarly to what was predicted by respondents in last year's report, with the Northeast and Southeast again taking the lead. Respondents predict the same pattern moving into 2024. ■

WHICH GEOGRAPHIC REGIONS HAVE BEEN STRONGEST?

2023 2024 prediction



WHAT IS YOUR BIGGEST PAIN POINT OTHER THAN LABOR?



34%
OF RESPONDENTS ADDED SHIFTS IN 2023, AND 9% REDUCED SHIFTS.

*Insurance costs, supply chain issues, material shortage, economic uncertainty

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CRL's exclusive line of Premium Shower Door Sliders elevates the look and function of shower enclosures, transforming an ordinary bathroom into an upscale oasis. The line includes Colonia, Brixen, Cavoli and Tofino—all crafted from durable 304-grade stainless steel and extensively tested to 20,000 cycles to ensure unmatched performance. Minimal hardware and concealed screws create a modern, frameless look, taking shower projects to the next level of luxury.

Colonia's circular-shaped header and round rollers complement each other perfectly. The high-quality rollers provide quiet and smooth door

movement to deliver a deluxe sliding shower door system with exceptional functionality.

Elegance meets durability with CRL's Brixen double bypass rectangular-shaped slider. Brixen intersects the popular double bypass application with sleek aesthetics to create a dynamic shower system that maximizes versatility.

Cavoli, the rectangular-shaped single header slider, features beautifully enhanced aesthetics. The wall bracket's two-way adjustability makes shower installations easier. The low-profile door stopper and mounting hardware covers create an attractive, minimalist design.

The premium Tofino oval-shaped single

sliding system has an entirely different look that sets it apart from traditional sliding systems. Roller bearings designed for quiet and easy door operation, paired with one sliding panel and one fixed panel, make the Tofino series both practical and appealing.

Premium Shower Door Sliders enhance aesthetics by reducing visible hardware and concealing all screws. This creates a distinct and sophisticated visual that conveys timeless elegance. Colonia, Brixen, Cavoli and Tofino sliders are available in satin brass, matte black, brushed bronze, and polished and brushed stainless steel finishes.

To learn more, visit crlaurence.com or call 800/421-6144. ■

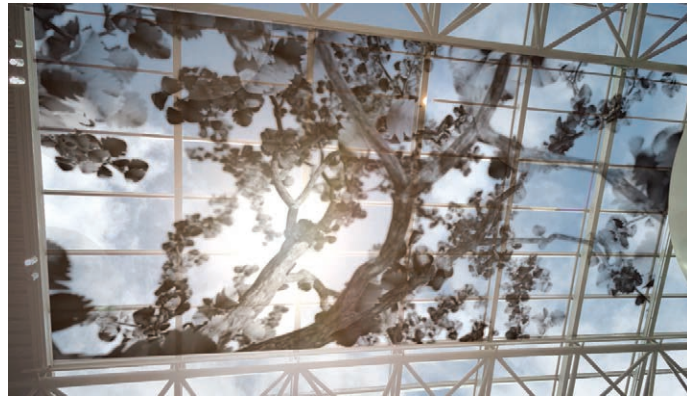
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01



02



03

01. Low-emissivity glass

Sungate ThermL glass by Vitro Architectural Glass is a low-emissivity coating engineered for use on the interior surface of a typical 1-inch insulating glass unit that reduces heat transfer and improves U-values when paired with a Solarban solar control low-e glass by Vitro on the second surface. Due to its colorless and low reflective aesthetic, Sungate ThermL glass enhances U-value but does not change the visual characteristics of the IGU.

412/820-8500 | VITROGLAZINGS.COM

02. Switchable privacy glass

SDX3 SmartView, by Skyline Design and Cardinal Glass Industries, is a switchable privacy glass with a film-free design utilizing liquid crystal technology for commercial spaces, including windows, doors or wall systems. SDX3 SmartView employs a proprietary liquid crystal technology applied directly to glass, offering a truly clear view in transparent mode and maintaining privacy when activated. SDX3 SmartView also employs minimal energy consumption.

773/757-5102 | SKYLINEDESIGN.COM

03. Generative video glass

Videowindow, akin to tintable glass, features segmented panels with rapid switching capabilities, harnessing sunlight as the screen backlight. It's ideal for transportation hubs, offices, hospitals and more. Its biophilic glare control employs procedural generative video patterns, mimicking natural foliage to mitigate glare. The result is reduced heat, serene ambiance and evolving visuals. This innovation aims to enhance comfort and holds potential for monetization.

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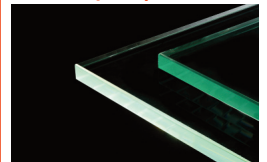
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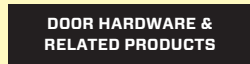
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
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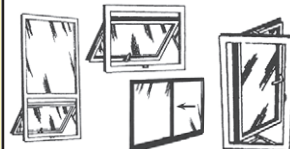
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
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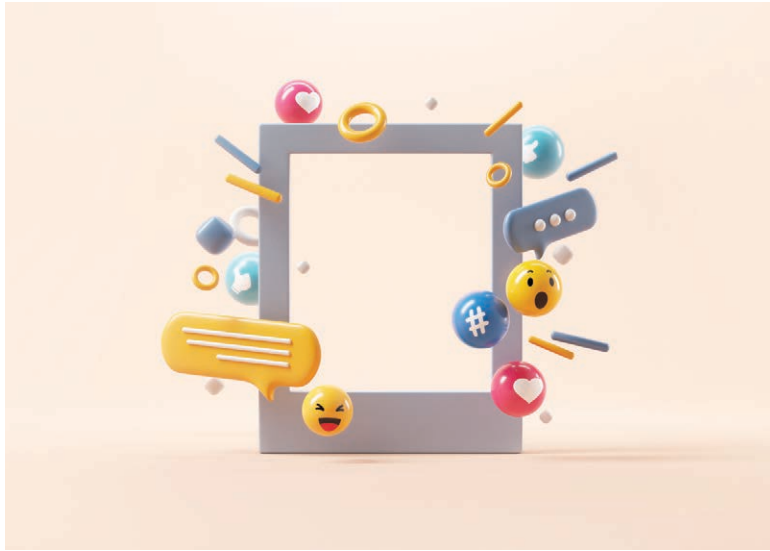
ATTENTION JOB SEEKERS

Use the Glass Magazine Employment Center to Help Find Your Next Job in the Architectural Glass Industry

The screenshot shows the Glass Magazine Employment Center website. At the top, there are navigation tabs for 'Job Seeker' and 'Employer'. Below this is a header with 'HOME', 'JOBS', 'YOUR PROFILE', and 'RESOURCES'. On the right, there are links for 'Help' and 'Sign In'. The main banner features a large image of people in a modern office with a city view, overlaid with the text 'Glass Magazine Employment Center'. Below the banner is a search bar with 'Keywords' and 'Location Search All Locations' fields, and an 'Advanced Search' button. A section titled 'Glass Magazine Employment Center Account Benefits' includes three icons: 'Post Your Resume', 'Apply For Jobs', and 'Get Job Alerts', followed by a 'Get Started!' button. Below this, statistics show '6 Job Listings' and '4 Employers Hiring'. A filter bar at the bottom of the section is set to 'Featured'. A featured job listing for 'Project Manager II' at 'Fargo Glass & Paint' in 'Minot, North Dakota' is displayed, with a 'See More Listings' button below it. The bottom section is titled 'Glass Magazine Employment Center Resources' and features a 'Career Learning Center' icon.

Visit jobs.glassmagazine.com to learn more!

Companies from all parts of the glass and glazing industry have implemented innovative, out-of-the-box ideas to improve business from the ground up. Here's an Idea showcases these sometimes small behind-the-scenes ideas that can make a big impact on a company's bottom line. If you have an idea that you would like to share, contact Norah Dick, ndick@glass.org.



YOUR 2024 SOCIAL MEDIA FARMERS' ALMANAC

BY SARA BARCHAK

The ever-evolving machine that is “social media” continues to steamroll into 2024. An estimated 4.9 billion people used social media across the globe in 2023, and that number is expected to jump to approximately 5.85 billion users by 2027. Let’s look at some trends we can expect this year.

Platform expectations

The average social media user logs on to seven different platforms monthly, but where should we focus our professional efforts? Here are the 2023 business usage statistics with these platform giants.

- **TikTok** saw the largest growth of business content in 2023. It is currently the fastest-growing platform in the United States, especially with younger audiences.
- **LinkedIn** will continue to be a professional-focused platform, but it is trending toward more personal

and less-curated content.

- **Instagram** is heavily saturated with strong brand presence, but it still saw slight growth in business usage in 2023.
- **YouTube** saw little business use growth in 2023, but it retains the number two spot worldwide for most social media users at 2.491 billion.
- **Snapchat** also saw little business growth in 2023, but it remains in the top three for the most-used platforms by Gen Z.
- **Facebook** remains king of global social media at 3.03 billion monthly users, but it saw a slight decrease in brand platform usage.
- **X (formerly Twitter)** saw the largest decrease in business usage of the platforms on this list at 7% less brand activity.

Real connection

Social media audiences continue to demand authenticity and real connections from brands and businesses. Content should treat your target group as people rather than simply a consumer.

The Stanley brand recently replaced a vehicle from a customer who posted a TikTok about her car catching fire—incredibly, even after the fire, the Stanley cup in her car remained unharmed and with ice still in it.

Commitment to sustainability

Research also proves that consumers prefer companies that actively work to reduce their environmental impact. Content highlighting sustainability efforts is consumed favorably. Allbirds, and their swarm of celebrity users, regularly highlight environmental conscientiousness with their sustainable processes and materials.

This is also seen in a rising trend called “deinfluencing” that is emerging on Instagram, TikTok and YouTube. As the desire to push back against overconsumption and unnecessary waste increases, popular social media personalities are using their leverage to promote brands and help their audience think more critically and sustainably about their purchases.

Short-form video content

For social media content, 66% of consumers report that short-form videos are the most engaging. We see this in the growth of TikTok and Instagram Reels. Be aware that there is an increase in social media users who watch videos without sound, so video captions are paramount. In addition, video captions improve search engine optimization, or SEO, rankings by allowing the script in your video to be searchable and aiding those who are hard of hearing. ■

Sara Barchak is marketing manager at EFCD.

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