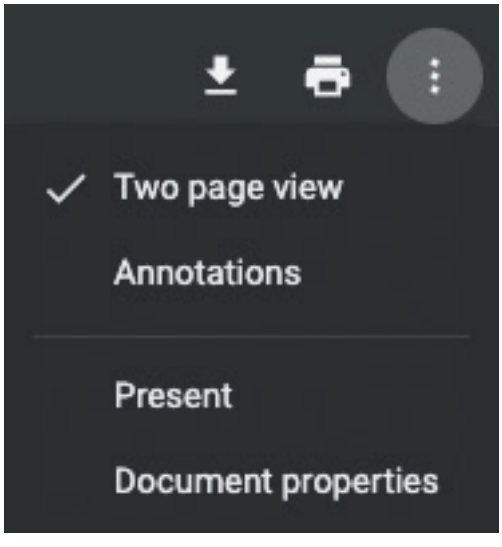
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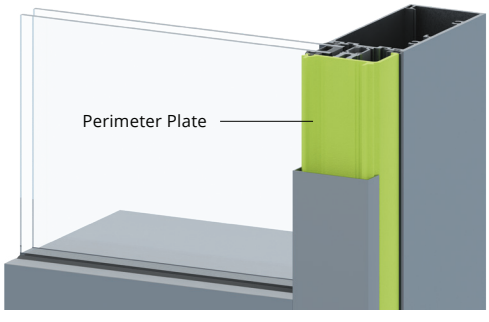
MATERIAL PERFORMANCE COMPARISON

	ATTRIBUTE					
MATERIAL	**Stiffness Flexural Modulus (Mpsi)**	**Specific Gravity**	**Density (lbs/in3)**	**Stiffness to Weight (FM/SG)**	**Thermal Coefficient of Expansion (µin/in-°F)**	**Thermal Conductivity (BTU-in/hr-ft2-°F)**
ROVEX®/ INNERGY® AP	**7.5**	**2.10**	**0.076**	**3.6**	**3.4**	**1.522**
Aluminum	10.0	2.72	0.098	3.7	13	1109.357
Polyamide-6.6 Fiberglass	0.7	1.3	0.047	0.5	11-17	1.596
Polyester Fiberglass	1.6-3.5	1.84-2.00	0.066-0.072	1.8	3-11	2-5

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ON THE COVER: The new 43-story skyscraper, 1550 Alberni Street, is this year's winner of the Glass Magazine Award for Project of the Year as well as Best Feat of Engineering. Complex glazing systems were supplied by nominating companies Kuraray and Glass 3 Enterprises, who will share the awards for their work on the project.



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SYSTEMS
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ADVOCACY
The Conversation on Glass
By Katy Devlin, NGA



PROJECT SHOWCASE

Pictured: Kingspan Light + Air's UniQuad wall systems, Quadwall translucent skylights and Briteway canopies were integrated on the interior and exterior of Grover Cleveland Charter High School in Los Angeles. Engineered for long-term durability and customization, the translucent walls and skylights feature removable skin technology, and provide effective daylighting throughout the campus. With removable skin technology, individual exterior or interior panels can be removed and replaced without disturbing the surrounding panels or structure—making maintenance and replacement easier. Photo by Benny Chan/Fotoworks.

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Elevating a New Generation of Girls in Glass



KATY DEVLIN
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Watch a video of Camp NAWIC's glass-cutting day.

- Learn more about Camp NAWIC at futureconstructionleaders.org/camp-nawic-san-diego
- Read about NGA's workforce development efforts at glass.org

In June, 70 teenage girls gathered in San Diego, California, to learn about cutting glass and opportunities in the glass and glazing trade. The event was part of Camp NAWIC, from the San Diego National Association of Women in Construction chapter. The free, weeklong program offers a hands-on approach to a construction career to high school girls, and this year marked the first time that glass and glazing were included in the program.

The event was made possible largely thanks to the efforts of San Diego NAWIC board member Kristie Rehberger, general manager, A Glasco Inc. "When I joined the board, I said I wanted to bring in more education about glass. I love the hands-on [events]," says Rehberger. Rehberger teamed up with Linda Young, who runs Camp NAWIC, to bring glass and glazing education to the students through the glass-cutting workshop.

"It was awesome to see the enthusiasm," says Rehberger. "When the event started, [the campers] came rushing in and were keen to get to work. I was surprised by their eagerness to learn and try something new."

Rehberger and a team of glass industry volunteers worked with the campers to safely seam and cut glass. The other volunteers included five members of the A Glasco team, Andrew Haring of the National Glass Association, Christy Sellers of Lemon Grove Glass & Supply and Casey Weir of Roundtree Glass Co.

Bringing women to the trades

NAWIC's—and Camp NAWIC's—mission is to promote career growth and development for women in construction, as women continue to be vastly underrepresented in construction. Women account for just 10.9% of the entire U.S. construction workforce, according to 2022 data from the U.S. Bureau of Labor Statistics.

"The end goal [is] to encourage more young people to choose a career in skilled trades by providing hands-on experience and training that exposes them to promising occupations and incredibly viable career paths in construction—and also debunking misnomers and stigmas surrounding women in the glass and construction industries," says NGA's Haring.

Reach out to the local community

One of the biggest roadblocks to bringing glass and glazing education to young people, particularly young women, is a lack of existing learning opportunities, says Rehberger. She recommends that glass industry companies reach out to schools and local community groups to offer to help bring glass and glazing demonstrations and education directly to students.

To aid in these efforts, NGA is creating resources for companies to help educate young people, including a new web page, www.glass.org/become-glazier, that uses video, career stats and personal stories to highlight the opportunities the glazing trade offers. "Our industry offers a path to build a long-term, rewarding career without stacking up college debt, and it is this message that we need to share with the public," says Jenni Chase, VP of Workforce Development for the NGA.

"You have the power to make it happen. It just takes doing it. We can't wait around for someone else to do it," Rehberger says. "After Camp NAWIC, I contacted five or six schools to say, 'We did this. Are you interested in having us do this with your students?' I already have one response saying yes, they are interested."

Camp NAWIC's glass event was held at the Associated General Contractors of America facility, and featured glass and materials donated by Frameless Hardware Company and Glasswerks Los Angeles. ■



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YOUR ASSOCIATION AT WORK

NEED-TO-KNOW INFORMATION FROM THE NGA

NEW JOINT GTP PUBLISHED

The National Glass Association and the Fenestration & Glazing Industry Alliance announced the joint publication of a new Glass Technical Paper, or GTP, "Compatibility Testing of Insulating Glass PIB Primary Sealant with Respect to Glazing Materials." The new GTP discusses methods of compatibility testing of glazing components with respect to polyisobutylene, or PIB, primary sealant in an IGU, recommends the use of the ift Rosenheim test method, outlines the effects of incompatible glazing materials, and addresses other factors that may affect compatibility. ■

DOWNLOAD THE NEW GTP AT GLASS.ORG

BLUEPRINT FOR COLLABORATION

NGA hosted a panel during the AIA A'23 Conference in San Francisco, held June 6-8, continuing its commitment to educating architects on the potential of glass and glazing products in design. "Blueprint for Collaboration: The path towards sustainable facades" focused on the future of glass in design for energy performance and sustainability and featured panelists who represent a different area of expertise within the industry. Panelists included Stanley Yee with Dow, Lisa Rammig with Eckersley O'Callaghan, Sophie Pennetier with Enclos, Chris Fronsoe with Vitro, Mark Suehiro with C.R. Laurence and Mike Turner with YKK AP, and was moderated by Tom Culp, owner of Birch Point Consulting LLC and NGA's energy code consultant. ■

SPECIAL GLASS INDUSTRY TRENDS WEBINAR

A special edition of NGA's Thirsty Thursday webinar series—10 Industry Metrics You Should be Watching—delved into the state of the global supply chain, the direction of the construction economy, and how current design and building trends are driving glass product development. Presented by Katy Devlin, NGA content director and editor-in-chief of Glass Magazine, the webinar is a gift to NGA members and the industry at large as part of our 75th Anniversary celebration.

Watch the webinar at glass.org/ondemand-webinars. ■



TESTING BALLISTIC GLASS

NGA's Andrew Haring, vice president of business development, had a good time testing ballistic glass in Texas, while at the same time amplifying the message that our schools need bullet-resistant glazing. With reps from NGA member Quikserv Inc./United States Bullet Proofing, he conducted unofficial testing (to ASTM standards) on UL 752 level 1 and level 8 ballistic glass.

"Yes, it was fun. More importantly, we're leveraging this opportunity to bring attention to the need for bullet-resistant glazing in our schools," says Haring. NGA staff and member company representatives also addressed the glass industry's role in school security during the second annual Glass & Glazing Advocacy Days, held in Washington, D.C. ■

GLASS INFORMATIONAL BULLETIN



BIM for Glass and Glazing Systems

Building Information Modeling, or BIM, is an intelligent, model-based process that starts in the early stages of planning and design. It is used through construction and can also be used throughout the operational management stages. BIM can even handle potential adaptive reuse through the life cycle of the building.

BIM is more than three-dimensional models. BIM projects can use intelligent objects that display the proper graphics at different scales, represent accurate geometry, and can be rich with manufacturer product data.

Power of BIM lies in the "I"

BIM objects can contain:

- Graphical information such as visualization and constructability analysis through 3D detailing.
- Non-graphical information such as performance and material data, and the ability to schedule construction and provide digital material takeoffs with increased precision.

Example of BIM LOD Specification for Exterior Windows

100	Solid mass model representing overall building volume; or schematic wall elements that are not distinguishable by type or material. Assembly depth/thickness and locations are still flexible.
200	Windows approximate in terms of location, size, count and assembly type. Units are modeled as a simple, monolithic component; or represented with simple frame and glazing. Nominal unit size is provided.
300	Units are modeled based on specified location and nominal size. Outer geometry of window frame elements and glazing modeled to within ⅛ inch precision. Nominal face dimensions and thickness of glazing. Structural support for window wall system, if applicable. Spacing, location, size and orientations of mullions. Operable components defined (windows, louvers and doors) and included in model. Required non-graphical information associated with model elements includes: • Aesthetic characteristics (finishes, glass types) • Performance characteristics (U-value, wind loading, blast resistance, structural, air, thermal, water, sound) • Functionality of the window (fixed, casement, hung, projected, sliding)
350	Mullion shapes and geometry defined. Attachment or anchorage layout and types defined. Actual panel dimensions.
400	Complete mullion extrusion profiles. Glazing sub-components (gaskets). Interface details between wall systems (within) and wall and support systems, including sealants, end dams, flashing and membranes.

GLASS INFORMATIONAL BULLETIN—BIM FOR GLASS AND GLAZING SYSTEMS

- Linked information such as manufacturers' websites, warranties and sustainability information.

This information can help align the expectations of architects, engineers, contractors, building owners, specialty consultants, product manufacturers and fabricators. Equally important, once a project is completed, BIM can provide building owners and facility managers with a complete "as-built" source for a more comprehensive building management solution.

BIM is a concept

There are many platforms that can be integrated together for a BIM-based project approach. There is BIM modeling (a process) of a BIM model (a building) using generic or project-specific manufacturer-supplied BIM objects (a product). Beyond providing geometry, the BIM model, full of data-rich objects, can be leveraged for extractable and measurable data used to analyze spatial relationships, orientation and surrounding site conditions; determine building energy usage and light analysis; and quantities and properties for building material takeoffs.

There are several software platforms classified as "BIM-capable," including, but not limited to, Autodesk, Revit, ArchiCAD, Vectorworks and AECOsim.

BIM process

The architect may begin with a schematic model by using masses or real elements in a BIM environment. This model is used to address site conditions and determine the size and shape of the building. During schematic design, scheduling and estimating can be incorporated into the elements of the model. This ensures that, as different schematic design options are investigated, estimates for time and cost can be constantly updated.

Industry collaboration teams may be assembled to work on system designs, glass and framing dimensions, and initial structural analysis. These elements can influence the look and feel of the building while optimizing the glazing system design that could trigger additional fabrication or installation costs. This period in the design phase may be the proper time to involve technical staff from manufacturers, fabricators and glazing contractors.

Once the construction drawings are released and the construction phase begins, software platforms including, but not limited to, Navisworks, BIM 360TM Glue and VEOTM may be employed. These allow for the architectural model to overlay with individual sub-contractor models to view clashes, inspect layout geometry and review interfaces with surrounding materials. BIM-enabled planning of erection and installation sequences optimize where the different trades operate within the building during construction. This can result in fewer workers on-site, with faster installation and safer job sites. Because of the efficiencies of BIM, some general contractors are using a BIM approach even if the architect did not start the project in BIM. These types of efforts also push the adoption of BIM further down the supply chain.

Level of development

The level of development, or LOD, is commonly mistaken for level of detail, which generally refers to how detailed or intricate an individual model element is. The LOD describes to what extent the element has been "thought through" and finalized. Adherence to the specified LOD will ensure that the proper level of effort is expended in each stage of the design.

A model may look like it is a final product in the final location, but based on the LOD the design team can know to what degree they can rely on the information when using the model. A clear LOD definition allows downstream users the ability to understand the usability and the limitations of the models they are receiving. BIMForum has a detailed LOD specification at bimforum.org/lod that breaks down different building systems and how the LODs apply to a specific system.

Conclusion

Utilizing BIM properly can reduce costs by the early detection of conflicts, errors and other design issues and facilitate collaboration between building project teams. ■

This Glass Informational Bulletin is excerpted from the NGA Glass Technical Paper IN05-17 (2022) "Overview of Building Information Modeling (BIM) for Glass and Glazing Systems." Download at glass.org/store.

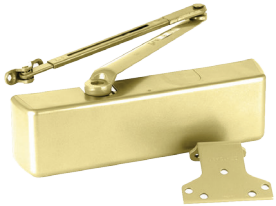


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A Life Dedicated to Glass



Semavi Yorgancılar, a glass guru, was born in Izmir, Turkey, in 1959. He began his career in 1976 with his family's glass trading business. In 1989, he established "Orim" a home appliances glass company in Bolu/Turkey, marking his entry into the manufacturing sector. In 2003, he sold Orim to the German company Schott, serving as its CEO for three years.In response to the call for "return to the kitchens" from his business partners, Yorgancılar re-entered the home appliances sector after 10 years. He ultimately emerged as a leader in the sector, solidifying their position in the market.

Throughout his career, Yorgancılar played an active role in industry associations and contributed significantly to export efforts. He was the founding president of the Association of Home Appliances Sub-Industries for three years and served on several industrial and trade chamber committees.

Yorgancılar has a deep passion for glass, believing it to be a unique material with unparalleled properties. He credits his love for glass as a key factor in his company's success. His main driving force is achieving excellence. As his company grows into a trusted, global supplier, Yorgancılar believes in pushing boundaries and embracing changes swiftly, an attitude that has benefited his firm greatly.

Refusing to stay in the comfort zone, Yorgancılar places immense trust in his team and emphasizes agile organizational structures.
In line with this, Yorgancılar has transformed from a glass processor to a glass manufacturer in the industry, with the establishment of a washing machine door glass production facility in the Manisa Organized Industrial Zone. This has positioned them as a one-stop partner for their business associates in the home appliances sector. The company recently doubled its workforce, reflecting its ambitious growth trajectory. Over the past decade, they have sold over 250 million units of glass to the home appliances sector. Refusing to stay in the comfort zone, Yorgancılar places immense trust in his team and emphasizes agile organizational structures. In a rapidly changing world, Yorgancılar underscores the importance of adaptability and continual evolution in business. His confidence in their future success remains unwavering, as he believes in the power of a progressive team and an ever-evolving company.



A Vision Sculpted in Glass

Established in 1974, Yorglass is a global leader in industrial glass processing and flat glass trading. The company's diverse product line, organized into four distinct units: Yorglass Trade, Yorglass Satinated, Yorglass Food Displays and Yorglass Home Appliances, caters to both national and international markets.

Operating seven zero-waste certified factories across four Turkish cities, Yorglass serves over 60 countries worldwide, offering a vast catalog of more than 150 glass types. In 2022, the company achieved significant growth, boosting their export ratio to 48% through production-based sales, and achieving a total export figure of $77 million. Today, Yorglass holds a 50% domestic market share and over 30% in Europe, underscoring their commitment to continual expansion and innovation.

Where Sustainability Meets Aesthetic Brilliance

Yorglass Satina, a global leader in the glass processing sector, is renowned for its innovative "zero pollution" treatment facility, launched in 2010. Further emphasizing its commitment to sustainability, it became the first to receive the 'Carbon Footprint Certificate' in its industry in 2017. It is Turkey's first decorative glass production facility, is famous for its unique offerings such as decorative glass, double-sided glass, and non-slip floor glasses.

The Perfect Harmony of Aesthetics and Safety at the Highest Level

Yorglass Satina's Yorfloor merges safety and style with its certified anti-slip flooring and stair glass. Its patterns, achieving the highest R13 safety level from Europe's IFA, are adaptable for various settings. With custom-cut designs for global projects, Yorfloor balances beauty, safety, and practicality, revolutionizing the industry.

Embrace the Beauty of Nature with Yorglass's Decorative Glass Series

Experience the allure of nature with Yorglass's Decorative Glass Series. Inspired by the natural world, these elegant and functional designs enhance any space, from cabinets to bathrooms and stair railings. With a wide range of patterns and versatile application options, Yorglass brings the energy of nature into your home, creating timeless and captivating interiors.

safesky Pattern Matters



Yorglass introduces Safe Sky, a revolutionary bird-friendly glass solution that goes beyond traditional approaches. With a unique perspective on patterns, Safe Sky sets itself apart from other bird-friendly glass products in the market.
Bird collisions with standard glass pose a significant threat to avian populations worldwide, resulting in a staggering loss of billions of birds each year. Yorglass recognizes the urgency of addressing this critical issue and has developed Safe Sky with a threat level of 16, prioritizing the safety and well-being of our feathered friends.

Safe Sky incorporates advanced technology and utilizes specially designed patterns on the glass surface. These patterns play a crucial role in enhancing visibility for flying birds, allowing them to detect and avoid potential collisions. Through extensive testing, Yorglass has demonstrated that Safe Sky significantly reduces the risk of bird strikes by an impressive 84%.
What sets Safe Sky apart is its innovative approach to patterns. Yorglass understands that pattern matters in creating effective bird-friendly glass. By carefully considering the design and placement of patterns, Safe Sky maximizes its visibility to birds, offering a higher level of protection compared to conventional solutions.

Beyond its immediate benefits for bird conservation, Safe Sky contributes to a more sustainable future. By reducing bird collisions, it mitigates the environmental impact and associated costs of bird mortality. Yorglass's dedication to sustainable manufacturing practices and ecological balance is reflected in their commitment to creating bird-friendly architecture.
With Safe Sky, Yorglass is leading the way in redefining bird-friendly glass and setting new industry standards. This innovative solution showcases their unwavering commitment to protecting birdlife, promoting sustainable practices, and fostering a harmonious coexistence between human-made structures and the natural world.

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

Oldcastle BuildingEnvelope Acquires Syracuse Glass Co.
Oldcastle BuildingEnvelope Inc. completed the acquisition of Syracuse Glass Co. Founded in 1909, SGC is an independent fabricator and distributor of architectural glass and aluminum products serving glazing contractors, manufacturers and glass retailers throughout Upstate New York, Eastern Pennsylvania and New England. OBE acquired SGC to enhance its presence in the Northeast region of the U.S.

"Syracuse Glass Company has delivered high-quality products and excellent customer service in its markets for more than a century," says Bruno Biasiotta, CEO of OBE. "We are excited about the prospect of leveraging our collective cultures and capabilities to build on SGC's great reputation. This acquisition will allow our teams to provide industry-leading glazing solutions to better serve our customers and partners and help them be successful."

PGT Innovations Announces Ownership Stake in Eco Enterprises
PGT Innovations acquired the remaining outstanding 25% ownership interest in Eco Enterprises LLC. PGTI first acquired a 75% ownership stake in Eco Enterprises in 2021 to accelerate revenue growth, expand margins and strengthen the supply chain by adding glass production capacity while diversifying and bolstering product lines to provide opportunities in residential and commercial markets. Eco is a brand of aluminum, impact-resistant windows and doors primarily serving the South Florida region, with manufacturing and glass processing facilities in Miami, Florida.

Arty Feles Steps Down as President of CRL
In an organizational statement from Oldcastle BuildingEnvelope sent to employees, CEO Bruno Biasiotta announced that Arty Feles, president, C.R. Laurence Co., informed OBE that he is resigning from the company due to personal circumstances, effective immediately. The company has accepted his resignation and wishes him the best in his future endeavors, says Biasiotta.

A spokesperson from CRL released the following statement:

"We will be filling the vacated president role, as well as expanding our CRL management team to support our current business and future acquisitions, which we are actively pursuing.

CRL remains steadfastly committed to our customers, our industry and our people who have built our great business. We continue to make investments in our footprint to better serve our customers with a broad portfolio of innovative products and technologies, along with best-in-class lead times and product availability."

TotalEnergies to Supply Certified Sustainable Biomethane to Saint-Gobain
TotalEnergies signed a 100-gigawatt-hours biomethane purchase agreement with Saint-Gobain France for a three-year period starting in 2024. TotalEnergies will produce the biomethane at its BioBéarn biomethane plant, which came on stream at the beginning of the year. The production is certified sustainable by ISCC1 under the highest sustainability criteria of the European Union REDII Directive.

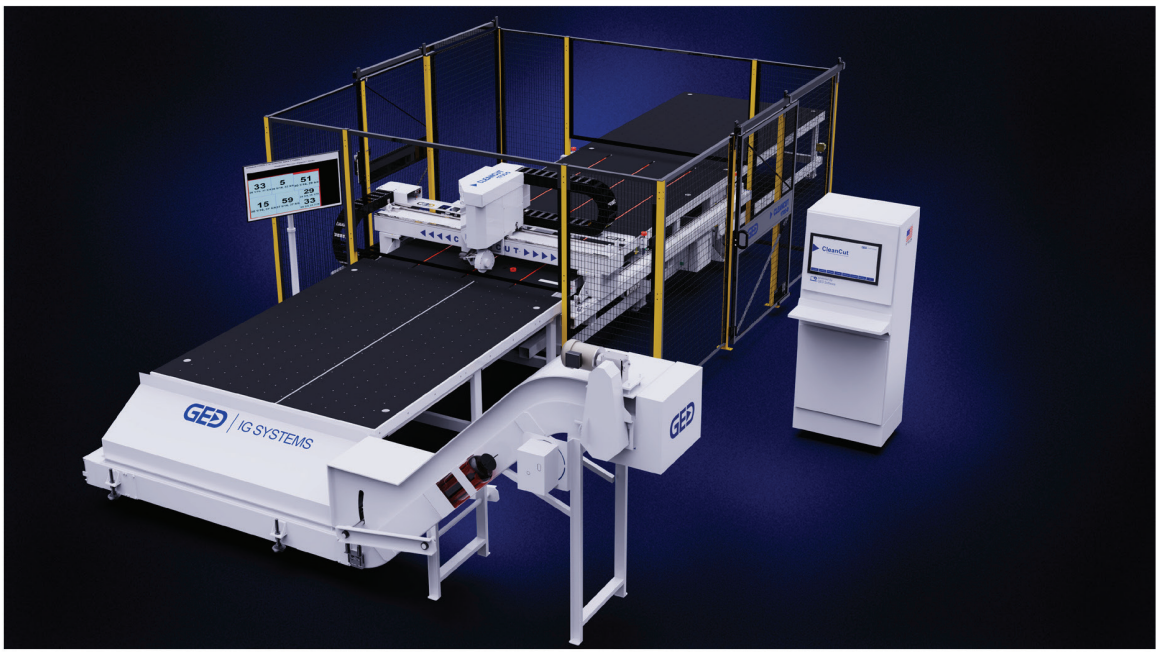
TotalEnergies is one of the first producers to obtain this certification in France, say officials. By acquiring the Guarantees of Origin, and thanks to its sustainable certification, Saint-Gobain will be able to attest, within the framework of the EU Emissions Trading Scheme, to the decarbonization of its energy consumption in France. This contract is also an example of a purely commercial sale—non-subsidized—of biomethane.

NSG Group Opens New Solar Array
NSG Group announced that a 750-kilowatt photovoltaic solar system opened in May at its Aken facility in Saxony-Anhalt, Germany.

The new array owned by Aken, with 1,500 PV modules installed on the open space and roof of the plant, will provide 650,000 kilowatt hours, around 10% of the annual consumption of the Aken facility in the future. The electricity generated by the array system on weekends and during periods of shutdown is fed into the public power grid. This project is a part of NSG Group's solar and energy savings projects.

AGC Glass Europe Produces Low-Carbon Flat Glass at Second Plant
The AGC Glass Europe facility in Seingbouse, France, now produces low-carbon Planibel Clearlite, a float glass whose carbon dioxide footprint has been reduced by more than 40%.

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The production of low-carbon Planibel Clearlite yields no more than 15.4 pounds of CO_2 per square meter for glass that is 4 millimeters thick. AGC Glass Europe first produced this glass at its facility in Moustier, Belgium.

Vitro Releases Updated EPDs

Vitro Architectural Glass published updated versions of its Environmental Product Declarations for both flat and processed glass. These updates affirm that Vitro's glass products contain less embodied carbon than the industry standard for architectural glass products and indicate a lower embodied carbon value than previously reported in 2017 editions of these EPDs.

EPDs offer detailed data about the embodied carbon values and life-cycle impact on the environment of a wide range of architectural building products. As a standard measure of embodied carbon, EPDs calculate global warming potential value expressed as kilograms of CO_2 equivalent.

Vitro's 2023 EPDs indicate that its products contain 1350 kilograms of CO_2 equivalent, 6% lower than the National Glass Association's industry standard figure and an improvement on figures reported in 2017.

YKK AP and cove.tool Partner

YKK AP America Inc. partnered with cove.tool, a building design and construction software provider, to further facilitate how architects reach the carbon, cost and energy performance goals of YKK AP's projects.

YKK AP will integrate its products into cove.tool's recently launched revgen.tool, a cloud-based solution designed to make it easier for building product manufacturers to engage design teams earlier in the process as they select products. With this tool, architects can identify and align which YKK AP-specific products may fit best with their project using real-time, product and project-specific performance analysis.

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Salem Fabrication Technologies Group Acquires Used Glass Machinery Marketplace

Salem Fabrication Technologies Group Inc. is expanding its glass fabrication offerings by acquiring Glass Machinery Locator, a used equipment marketplace.

Glass Machinery Locator will become the used equipment division of Salem Fabrication Technologies Group. The re-branded and re-designed Glass Machinery Locator website will allow North American fabricators to buy or sell used tempering furnaces and fabrication equipment.

Glass Machinery Locator will liaise between buyers and sellers throughout the transaction process. Existing staff at divisions Salem Fabrication Supplies and HHH Equipment Resources will assist with developing pricing, identifying machine specs, deal communications, marketing efforts, shipping logistics, paperwork requirements and more.

Sisecam Takes First Steps into Field of Technology Development

Sisecam has signed a letter of intent to become an investor in Turkish technology company ICRON, an optimization platform service provider to numerous sectors for strategic and operational decision-making. The investment is part of Sisecam's determination to invest in promising technology-focused companies and projects, say officials.

According to the letter of intent signed by Sisecam's CEO Gorkem Elverici and ICRON's CEO Gurer Unal in Barcelona at Gartner's Supply Chain Expo 2023, if the negotiations end with an agreement, Sisecam will have an option right to increase its total stake in ICRON by up to 50% by 2027.

Glaston to Restructure Business Units, Executive Leadership

Glaston Corp. will reorganize its current structure to better serve its customers in the architectural, automotive, display and solar glass processing markets. Glaston aims to accelerate the implementation of its strategy for the 2021–2025 period. Glaston's strategic financial and non-financial targets have not changed. The new organization is planned to come into effect on Oct. 1, 2023.

In the new structure, Glaston plans to form two business areas according to its customers' end-use segments: architecture and mobility, display, and solar. In addition, new global business functions, automation and innovation, and sourcing and supply chain management are planned. Sales and Services will continue as global functions, working together with the business areas. New appointments will also be added to Glaston's executive management group.

Paragon Tempered Glass Expands Ohio Facility

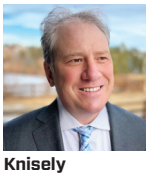
Paragon Tempered Glass will invest more than $15 million and create 12 new jobs at its Paulding County, Ohio, facility to better meet customer demand, according to an article by RGP Northwest Ohio. The investment in new machinery aims to allow the glass fabricator to improve efficiencies to remain competitive and position for additional growth.

PEOPLE NEWS



Boland

Corey Boland joined **AGNORA** as CEO on May 23. Founder *Richard Wilson* is stepping back from his role as CEO but will continue to actively work with the board of directors. Boland comes to AGNORA with over 25 years of experience scaling manufacturing businesses across North America and into global markets.



Knisely

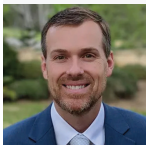
Scott Knisely is the new president and CEO of **Forel North America**. Knisely has over 15 years of experience in the glass industry, including his position as vice president of sales for Forel NA these past years. He has previously held other senior leadership roles within the industry.

Marco Schiavon, former CEO of Forel NA, has finished his mission in the U.S. and will return permanently to Italy, where he will take up a management role at Forel headquarters.



Sciola

Nick Sciola Sr. will step down as CEO of **Hartung** and *Nick David Sciola* will take the helm as CEO in addition to his current responsibilities as president. After 35 years as CEO, Sciola Sr. will be transitioning to the role of executive chairman of the board.



Taylor

NEXT Energy Technologies promoted *Brenton Taylor* to CEO. Taylor brings more than 20 years of experience in leadership, scaling manufacturing and commercialization of advanced technology innovations to NEXT. He most recently served as chief operating officer at NEXT. NEXT's founding CEO, Daniel Emmett, is stepping into the newly created position of executive chairman, supporting Taylor's transition. Emmett will continue to provide strategic support with fundraising, investor relations, high-value international markets and regulatory policy.



Stephens

PGT Innovations appointed *Chris J. Stephens Jr.* to its board of directors. He was appointed to serve on the board's audit committee, also effective June 28. He will serve as a Class III Director, and the board expects to nominate him to stand for election as a director at PGT Innovations' 2024 annual meeting.

Steve Wood joined **Roto North America** as a business development executive. In this position, Wood will be collaborating

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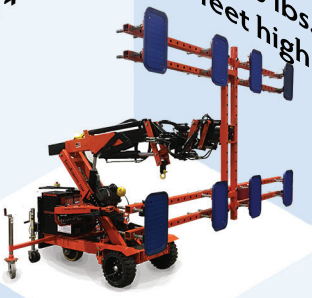
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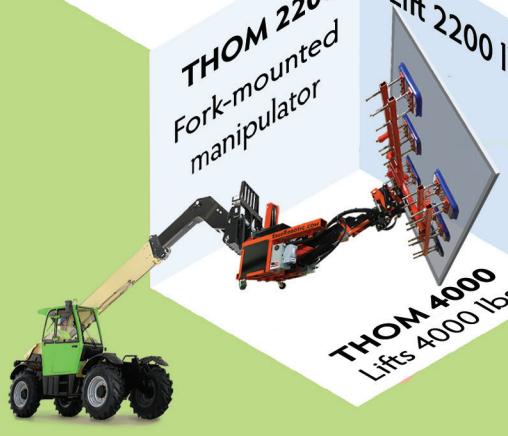
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Wood

with the sales team and promoting new business in the swing patio door and commercial aluminum market. Wood will be reporting to Dan Gray, director of sales, Roto North America.


Pano

Vitro Architectural Glass welcomed *Mark Pano* as national architectural manager for the New England region. Pano will identify and manage key construction projects in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont, assisting and advising architects.

Before joining Vitro, Pano spent eight years in the coatings business at Fortune 500 companies, including RPM International and PPG.


Kumar

Kawneer named *Sneh Kumar* the director of global sustainability. He will develop and lead the company's sustainability strategy, focusing on product design, certification, and supply chain transparency and optimization.

Kumar has spent over 20 years in the manufacturing and building products industry. He has been involved in commercializing over 40 high-performance building facade products. Before his new role, Kumar was a product manager for Kawneer's curtain wall, window wall, sun control and finishes.


Wells

Giroux Glass hired *Walter Wells* as safety director. In this role, Wells is based out of the company's Los Angeles headquarters and travels frequently to oversee safety operations on projects throughout Arizona, Nevada and Southern California.

Wells joined Giroux Glass in May 2023 after having worked previously for electrical contractor A.J. Kirkwood & Associates, initially as its safety manager, then as risk manager. Wells has certifications that include Construction Health and Safety Technician, Safety Trained Supervisor Construction, Construction Risk and Insurance Specialist and CPR, among many others issued by FEMA and OSHA.


Haines

U.S. Bullet Proofing, a division of Specialty Fenestration Group, announced that physical security solutions expert *Tom Haines* joined the company as government business development manager.

Haines' role will include working



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directly with government agencies, architects, contractors, purchasing agents and security experts within the government sector to develop design solutions for their upcoming projects. Haines has been involved with ballistic, blast, storm impact and forced-entry-rated windows and doors for the last 23 years.



Najmi



Kirkman

Unicel Architectural Corp. announced it hired *Mariola Najmi* as Southwest U.S. regional sales manager, covering the states of Arizona, California and Nevada. Najmi has a decade of sales and specifications experience in the building materials industry, including as regional sales manager for CMI Ltd. and Sto Corp.

As regional sales manager, Najmi will work closely with Unicel Architectural's range of glazing products.

The company also welcomed *Greg Kirkman* as regional sales manager for the mid-Atlantic region. Kirkman will be responsible for South Carolina, North Carolina, Virginia, Georgia, Tennessee, Maryland, Delaware and Washington, D.C., As regional sales manager, Kirkman will work closely with Unicel Architectural's range of glazing products, including Vision Control IGUs with integrated louvers.



Carlos

Joe Carlos has joined **GlasPro Inc.** as director of business development.

Carlos has over 35 years of glass industry experience covering the Western U.S. in many capacities. In the newly created role, he will leverage his expertise in identifying and creating sales opportunities for value-added architectural and decorative glass products. ■



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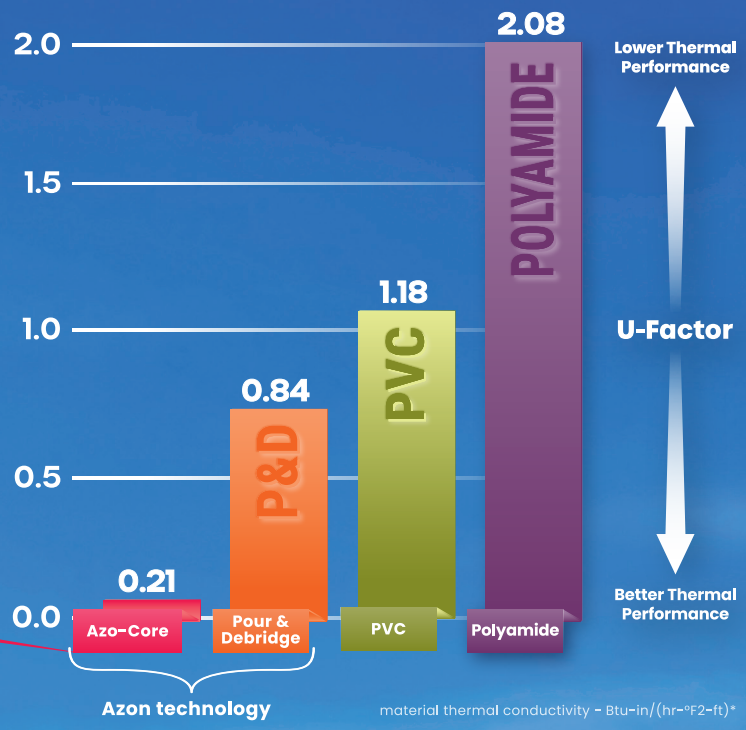
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INSIGHTS

26. INNOVATION
30. TECHNOLOGY
34. SAFETY
38. FACTORY FLOOR



INNOVATION

SOWING THE SEEDS OF INNOVATION

INNOVATION ISN'T JUST LUCK—IT'S THE ORGANIZATIONAL DEDICATION TO CREATING CHANGE WITHIN YOUR MARKETPLACE **BY JIM NIXON**



What do you think of when you hear the word "innovation"?

It might be several things. It might be a flashy new gadget. An idea for how to do things differently. A product or service that outperforms what's currently available in the marketplace.

Personally, I'm a fan of how innovation is defined by McKinsey & Co.: "Innovation is the systematic practice of developing and marketing breakthrough products and services for adoption by customers."

In describing innovation as a "systematic practice," this definition hits on something important. Innovation isn't just a flash of inspiration. It's an organizational commitment to the fostering and development of new ideas. It's not one-and-done. It's ongoing investment and support, much like the continuous improvement journeys of our manufacturing floors. And it's not the job of just one person. It's close collaboration and resource sharing between cross-functional teams.

As the vice president of innovation and new markets for Quanex, it's my role to make these ideas a reality within our organization. And I believe that—to create real, meaningful progress within an industry that is constantly demanding it—these ideas are essential for all stakeholders within the commercial glass industry. With all of this in mind, here are some ways we approach innovation, which you might also find helpful.

Bring your people together

Innovation can happen anywhere, at any level of your organization. But it can occur more frequently and naturally if different people and their varied skill sets aren't relegated to silos.

For example, suppose your company has several different business units. Each unit serves a discrete market, perhaps with some overlap between themselves here and there. They may also have their own teams of engineers, R&D professionals and others responsible for



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new product development, and perhaps they don't spend much time interacting with each other.

But the sharing of ideas between such teams can be a game-changer. Those teams may have distinct access to different processes, different tools, and of course, different ideas. The methods of one engineer may be eye-opening to that of his counterpart in the other business, and that can lead to potentially dramatic results in terms of new product development, material science or other areas of progress.

Alternatively, suppose your company serves a single market with a relatively narrow scope of products and solutions. The sharing of ideas is still absolutely critical. Your product engineer, for example, doesn't see the same things your production line technician sees every day. Encouraging the continuous sharing of ideas through channels like these can lead to new ideas that wouldn't have been discovered otherwise.

Failure is essential

Embracing and investing in new ideas requires understanding that not all will work. If they did, true innovation would be easy. Failure is a vital component of the innovation and learning cycle. If an organization is genuinely committed to innovating within its field, this should be an idea that's widely supported across all areas of your business.

This includes organizational support, starting from the top, for whatever the outcome. Failure does not signal that the time to invest in innovation is over, quite the contrary. Failure comes with its own value. Your teams will learn lessons they can apply to the next venture. What didn't work, and why. It's essential to uncovering true innovation.

Why innovation matters

The commercial glass and glazing industry is one of continuous change. New building codes continue to drive more stringent performance requirements. Architectural designs grow bolder. And the demands of glass are increasingly complex. Consider: Windows and glass facades of the future could combine highly energy-efficient PVC framing, smart glass and solar components that help a home or building generate as much new energy as older technology used to lose through heat loss.

The future is limitless, but it's on us to keep investigating new opportunities, to seek out material choices that contribute to better thermal efficiency, architectural excellence and everything else that continues to push the glass industry forward. We also need to keep working together, collaborating with partners and vendors to identify the best ways to make it happen. ■

Jim Nixon is vice president of innovation and new markets at Quanex.

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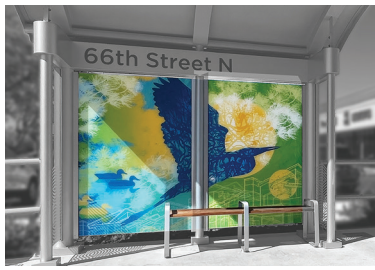
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IMPLEMENTING SOFTWARE SYSTEMS TO MAXIMIZE EFFICIENCY

YOU ONLY HAVE ONE CHANCE AT A FIRST IMPRESSION, AND THAT'S ALSO TRUE WITH LAUNCHING NEW SOFTWARE

BY MARK SUEHIRO



Computer software can be a powerful tool, but only if your teams put it to use. Successful introduction, training and support of new applications are required to achieve maximum value from investments in software. Whether the impetus to incorporate new apps into the business is meant to address profitability, efficiency issues, the shortage of skilled labor or strategic expansion, buy-in from staff is the lynchpin to success.

Some systems, like expense management or time management software, may be used across the entire team. Other systems may be utilized by individual groups, such as estimating or accounting software. No matter the number of users, software is only useful and valuable if team members put it to use.

> "SUCCESSFUL SOFTWARE ADOPTION BY GLAZING COMPANIES CAN IMPROVE STAFF AND BUSINESS PERFORMANCE, MAKING THE ORGANIZATION MORE EFFICIENT AND PROFITABLE."

Introducing new software

You only have one chance to make a first impression, and that's also true with launching new software. Whether teams are tech-savvy or loathe the thought of making a new application part of their work process, a proper introduction sets the stage for successful, long-term adoption.

Make it personal. Introduce the new software by focusing on benefits for the user, not the company. Start by outlining the specific benefits staff can expect to receive—saving time, gaining efficiency, streamlining laborious processes, eliminating paperwork, etc. Employees are much more enthusiastic about using new software when they understand how it will help them do their jobs better.

Companies that identify internal champions increase the likelihood that new software will be accepted and used. Consider starting with a focus group of employees to be trained on the latest software. They can advocate and support team members throughout the learning process. Starting small and then expanding to the entire staff is a proven method for successfully introducing new applications.

Training

Properly introducing new software is essential, but it is not a substitute for training. Only a well-thought-out training program will maximize the investment in new software, helping staff recognize its utility and empowering them to make it an integral part of their daily work lives.

When developing a training program,

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consult with the software maker. They will likely have training resources and perhaps even entire programs they can manage and implement for you. And they are certain to have support materials—cheat sheets, instructive videos, webinars—that will supplement the training process.

Most glazing companies discover they have two types of software users on their staff: tech embracers and tech abstainers/newbies. Effective training recognizes the differences in learning styles between these two audiences and will address the specific needs of both groups.

For tech embracers, training should focus on maximizing the utility of a software package. This group tends to be tech-savvy, thirsting for feature-level tips and tricks to deliver small but essential advantages. They can handle the details, and the company will benefit from their advanced abilities.

For tech abstainers/newbies, a different type of training program is required to convert resistant or inexperienced staff into capable users. Focus on the basics, building a foundation with these individuals to use the core components of the software. Don't overload them with the minutiae, but help them understand the primary software features and functions supporting them in specific work duties.

Ongoing support

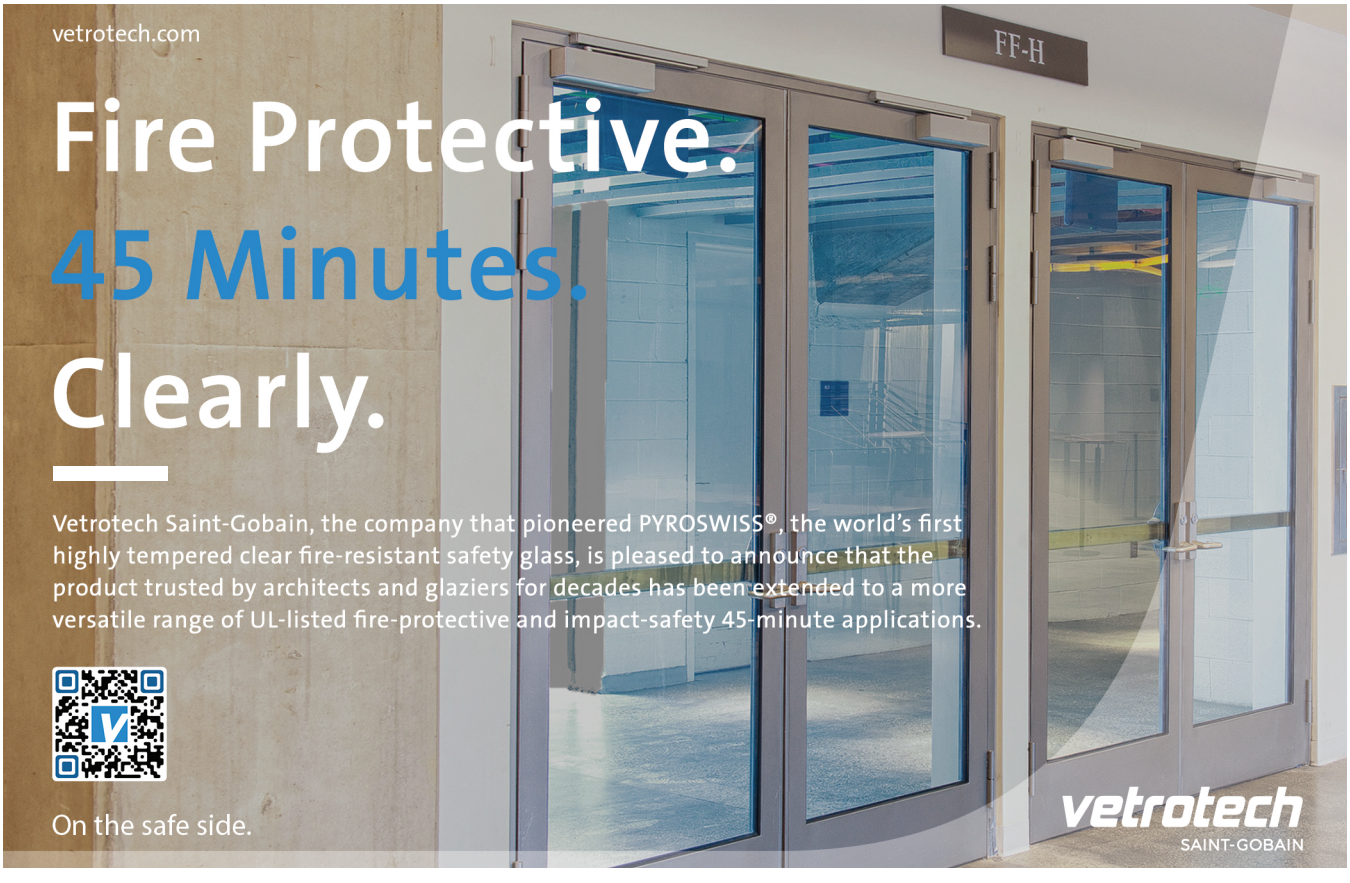
Fully leveraging the power of individual software programs takes time. It's an investment for both the company and the individual. Start by recognizing that training never stops. New hires must be brought up to speed on company systems. Current employees also benefit from periodic training to keep their skills sharp and add new technical abilities to their repertoire. Several online training resources are available, such as myglassclass.com for glaziers.

Establish systems to address ongoing questions and concerns through internal company champions or the software maker. Provide avenues for continuing feedback. Your frontline staff may have insights into technical aspects of the software or new processes to better leverage the system's power. Tap into that knowledge by encouraging their input.

Key takeaways

Successful software adoption by glazing companies can improve staff and business performance, making the organization more efficient and profitable. Identifying a new software system that can deliver value is only the start. Developing a comprehensive plan for introducing the application, training the staff, and supporting their needs over the long term is the roadmap for making investments in new software pay off. ■

Mark Suehiro is director of architectural hardware and entrances for C.R. Laurence Co. He can be reached at mark_suehiro@crlaurence.com.



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7 GLASS MANUFACTURING HEAT SAFETY MYTHS

HEAT ILLNESS IS 100% PREVENTABLE, SO TAKE EVERY STEP NECESSARY TO KEEP YOUR GLASS WORKERS SAFE IN THE HEAT **BY M.B. SUTHERLAND**

The increased focus on heat safety in the workplace is a welcome change that saves lives. But for workers in hot indoor facilities like glass manufacturing plants, it can feel like all the emphasis is on outdoor work. Hot indoor environments can be just as dangerous and fraught with avoidable heat safety misconceptions. Here are seven indoor heat safety myths to watch for.

MYTH #1

Indoor facilities don't get hot enough to cause severe heat illness.

If you work in a non-air-conditioned glass plant or in a climate where the air conditioning has trouble keeping up, we're betting you already knew this one was false. While none of the risks below are exclusive to indoors, any of the following can increase your workers' likelihood of indoor heat illness, up to and including heat stroke.

Heat and humidity. Consider both heat and humidity when you schedule breaks and cooling measures since humidity impedes the body's ability to release heat through sweating.

Heavy exertion. Hard work coupled with high facility temperatures can be deadly as workers accumulate heat internally and externally.

Heavy machinery/radiant heat. Heavy machinery churning away in your facilities can act like little indoor suns, throwing off heat and increasing danger for your workers.

Confined spaces. Workers in small, enclosed areas may be at higher risk of overheating due to poor air quality.

Medication and alcohol. Even medications as common as over-the-counter allergy medicine or having a few beers at a party the night before can lower a person's ability to regulate body heat.

Underlying health conditions. Heat safety isn't one-size-fits-all. Medical conditions like high blood pressure, diabetes or being overweight can increase the likelihood of heat illness.

MYTH #2

You can pick just one spot to measure the temperature in your facility.

Things like hot machinery, airflow, the size of a space and the number of people working in a space can make heat safety hazards very different in one area of your facility versus another.

Use a wet bulb globe temperature monitor indoors and outdoors to measure air temperature, humidity, radiant heat and airflow in various locations. This small but powerful device gives you a much more accurate measure of the actual heat load in various areas than a standard thermometer can.

MYTH #3

Air-conditioned breakrooms prevent heat illness.

The availability of nearby air conditioning is one advantage of hot indoor work over hot outdoor work. But air-conditioned break and lunchrooms will only help prevent heat illness if workers can access them at frequent intervals. If you wait for symptoms of heat illness to appear, you already need more interventions.

As indoor temperatures rise, increase the number of air-conditioned breaks in the day and create body-cooling stations in these areas with cold cotton towels in refrigerators or freezers. Ensure employees whose jobs require extensive PPE or other gear have time to remove it, cool down, and put it all back on properly within their break times without rushing.

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- Writing and drawing on the side surface of the sheet.
- Straight or curved beveling on the top side of the sheet.
- Straight and/or curved engraving and/or engraving on the top side of the sheet.
- Drilling on the underside of the sheet.

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Myth #4

Body cooling PPE is only for outdoor work.

Since most of the workday is spent not on an air-conditioned break, provide body-cooling PPE that workers can activate and reactivate throughout the day. Specialty cooling garments are designed to harness the natural power of evaporation for cooling without the need for chemical coatings that can make other products feel slimy. Able to be activated repeatedly on the job with any water temperature, these materials cool to as low as 30 degrees Fahrenheit below average body temperature in under a minute and stay cool for up to two hours.

MYTH #5

Hazardous work requires heavy PPE, and getting overheated is part of the job.

This myth is common as the dangers in glass plants sometimes require almost full-body coverage for safety. But new technologies and manufacturing techniques have made bulky, itchy protective clothing a thing of the past.

Cut-resistant protective tops are now available that are 30% lighter weight while providing the highest ANSI Level A9 cut levels. New sleeves and gloves on the market also provide ANSI A9 protection and are paired with new glove-coating technologies and cut-resistant materials that can eliminate the hot and uncomfortable practice of double-gloving.

MYTH #6

Workers have more access to water in indoor facilities, and everyone is hydrated, so heat illness isn't a concern.

It's essential to address the fact that, in many facilities, workers do not have adequate access to hydration throughout the day, and managing this should be job one. But on top of that, a crucial heat safety lesson that many environmental health and safety professionals miss is that even well-hydrated workers can suffer any heat illness, up to and including heat stroke.

A worker in a hot environment, exerting heavily, covered in PPE will need more than hydration alone to prevent heat illness.

MYTH #7

Getting someone into a cool room is adequate to treat heat illness.

Getting a sufferer into a cooler environment is just one weapon in your arsenal against the damage that heat illness can cause. Pay attention to the symptoms the victim is showing and treat accordingly. ■

M.B. Sutherland is the senior safety writer at Magid. Learn more at magidglove.com, or 800/444-8030.



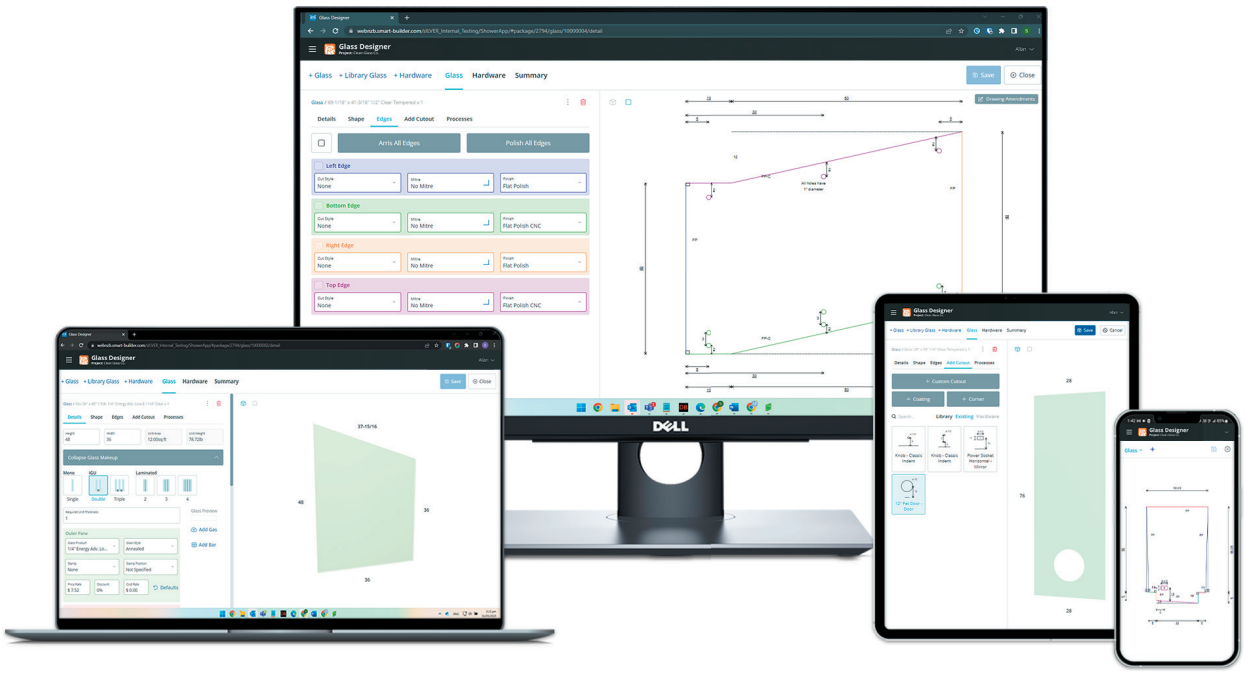
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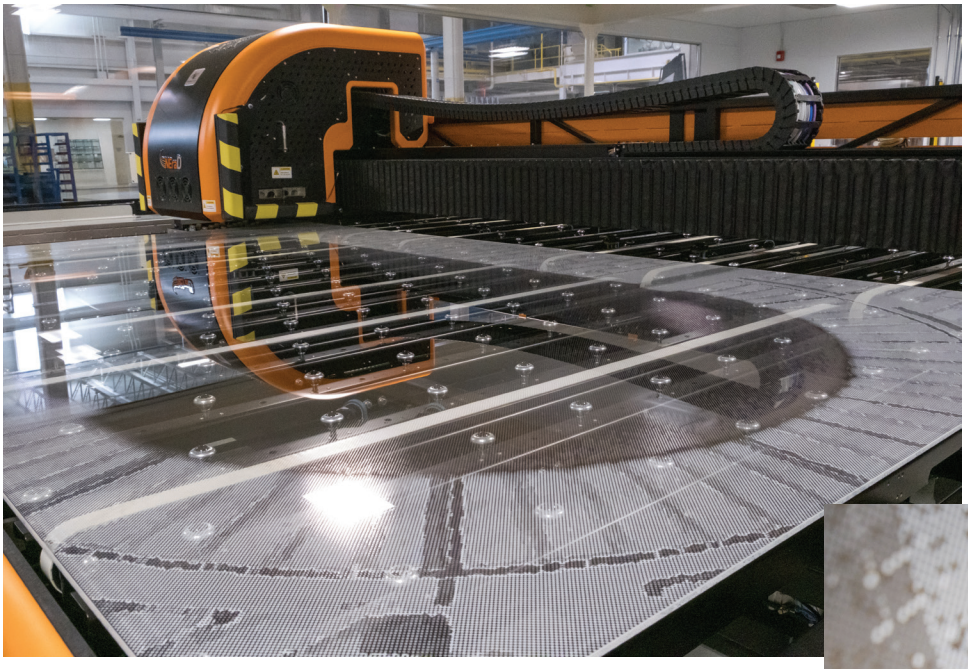
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Ceramic frit digital printed glass at AGNORA's glass fabrication facility.



A CHECKLIST FOR GLASS PRINTING

DEMYSTIFYING DIGITAL AND DECORATIVE PRINTING ON FLAT ARCHITECTURAL GLASS

BY ADAM MITCHELL



When I started at AGNORA, I was thrilled to see the large-format, direct-to-substrate capabilities in-house. Having spent over 15 years in large-format printing, I thought I knew printing through and through. Still, Joe Lindsey and the print team at AGNORA showed me the subtle and not-so-subtle differences between traditional large-format printing and printing on glass.

This article aims to provide insights into the different print processes available for architectural glass—the strengths of each, and considerations that must be considered when bridging client needs with fabricator capabilities. Having some or all of these considerations answered will streamline the print process and, with a bit of hard work, exceed expectations.

Why print on glass?

In short, printing on glass allows designers to create transformative glass spaces. Glass can become a canvas for creating unique designs to be incorporated into public art features and into buildings such as hospitals, transportation stations and building lobbies.

I spoke with Michael Saroka, CEO of Goldray Glass, to gain another perspective. Goldray Glass is another leading company that has been printing decorative glass for construction projects across North America for more than 37 years. Saroka has been on the shop floor since he was knee-high, learning about the relationship with paints, glass and heat. He helped me to expand on the benefits of printing on glass.

"The current generation of digital printers allow designers to expand the decorative canvas to both exterior and interior projects," he says. "Digital printing's flexibility means it can be used monolithically or included in laminated and insulating glass units."

How is glass printing different?

Coming from the traditional print industry, when considering large format for a project, there are standards that are adhered to. For example, Pantone is the go-to color library, often integrated with color and tone



Ceramic frit digitally printed decorative glass encloses the new One Young Street building in Kitchener, Ontario. Photo courtesy of AGNORA.

GET TO KNOW THE PRINTING OPTIONS

One of the first things to note is the variation in ink and print types and their applications. The following table breaks down the difference between ceramic and organic-based ink systems, which are both used for digital printing on glass.

SOURCE: GOLDRAY GLASS AND AGNORA.

	CERAMIC FRIT	ORGANIC INK
MANUFACTURING PROCESS	Ceramic ink applied to glass is heated to 1,100 degrees F (600 degrees C) and becomes fused to the glass. In other words, it must be tempered to cure. Notes: • Easily customizable • Highly versatile • Low volume	Organic printing technology allows for direct-to-glass printing after the tempering process, or without tempering at all. Notes: • Easily customizable • Highly versatile • Low volume
LIFE EXPECTANCY	Unlimited, because the frit is fused to the glass.	Many years when not in the presence of natural light or exposure to UV. Suggested for interior use only.
RESISTANCE TO ULTRAVIOLET	Ceramic frit does not break down when exposed to UV rays.	Organic ink may break down in the presence of UV, over time.
COLOR MATCH	Matches very well with dark colors. Limited gamut when extending into yellow and red.	Exceptional color-matching capabilities.

reproduction certifications such as G7. Further, extended color ranges beyond CMYK (cyan, magenta, yellow and black) are also commonplace, and you may find yourself with a wider, more precise color gamut by adding light cyan, orange or light magentas. Do you require Coca-Cola red? Walmart blue? No problem. High-end print providers can nail those brand specifics.

However, digital printing on glass does not follow these traditional, entrenched standards.

- The printers are bespoke, require larger investments and can be narrower in their capabilities.
- The glass printing industry is a specialty area, supported by a dedicated team of skilled technical experts.
- The print engines or "rip software" are customized and require inherently steep learning curves and specific knowledge.
- With glass printing, the color gamut can vary and is often proprietary to the print manufacturer.
- Takeovers and mergers appear to be higher in the glass printing industry as small printer companies get bought, resulting in changes in the supply chain (communication, parts, ink).
- Finally, glass acts very differently with inks than other materials such as vinyl or fabrics, demanding more innovative, solution-oriented thinking. "Color matching, vibrancy, fading and pixelated imagery are real challenges facing designers and printers," Saroka says.

Why am I sharing these seemingly broad drawbacks? Because it lays the foundation for understanding what to expect from direct-to-glass printing, the challenges these types of specialty fabricators face, and the dedication you can expect from the companies that do it.

"Like all technology, it is important to not only understand what is possible but have experienced operators and product designers guiding the creation of the product. It is not enough to own the technology; owning a chisel does not make you a sculptor," says Saroka.

Application considerations

If you require custom digital printing, you may have to ask a few questions to know what you'll be receiving from your print partner.

Will the project be indoor or outdoor and be exposed to natural light?

Ceramic inks are not prone to fading. However, organic inks may fade over long periods, more noticeably in reds and yellows.

Will passersby have a close-up view of the glass?

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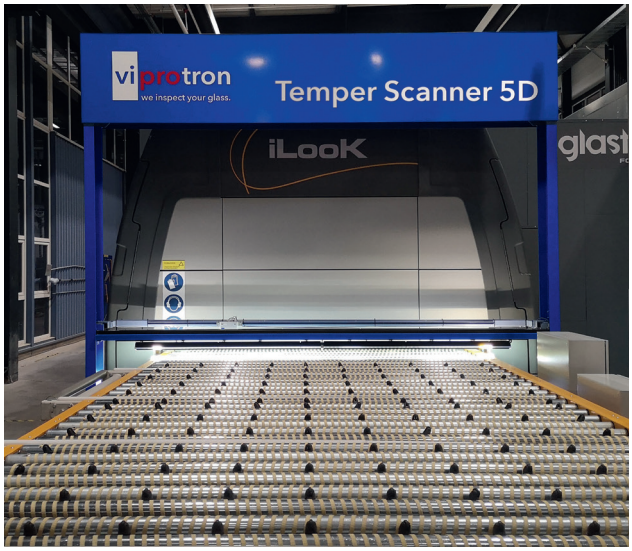
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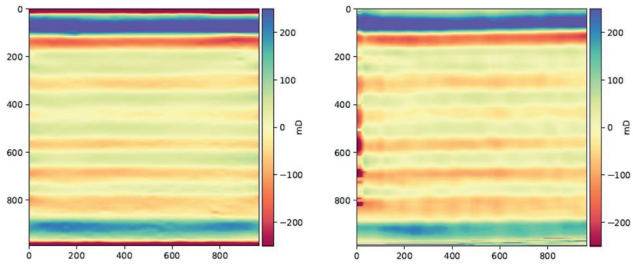
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Indoor applications are typically viewed close-up and require higher-resolution artwork to be of acceptable quality.

What is the required color?
Opacity refers to how "see-through" the ink is, with 100% opacity equalling full coverage, while 0% is no ink at all. Both digital print methods provide values from 0 to 100%.

Gradients refer to the "shading" from one opacity value to another for a given area. Both print technologies provide robust gradients devoid of "banding."

Color gamut is the range of available colors. Organic inks provide a wider, impactful gamut of color and can easily match existing color libraries. Ceramic inks have a reduced range of colors, notably reds and yellows; however, specialty inks can be mixed to achieve a desired color.

What are the design requirements?
Photorealism is possible in digital printing. Reproduction of photographs and their inherent range of color are available for both ink types. Organic inks tend to reproduce real-life images better due to color. Both ink systems produce abstract (illustrations, drawings, vector artwork) well.

Alignment should also be considered if a single image is spread across multiple lites. How will the image be aligned across the lite? Will the image be cropped in the case of different-sized lites?

Edges must also be taken into account. Is the print against the edge? Is there a chamfer? Is the glass custom in shape, and do edges need to align perfectly if no mullion is present?

What are the size requirements?
The overall available sizes for North American facilities are 130 by 300 inches for ceramic-based inks and 77 by 118 inches for organic-based inks.

Experience matters
Working with companies you know will be at your side when you need a replacement, answer questions, and being there "tomorrow" goes a long way in overall support. A broken lite many years down the road may be a pain to match; however, high-quality glass printers may output a replacement, especially if they were the originating firm. ■

Editor's Note: The views expressed in contributed columns to Glass Magazine belong to the author and do not reflect the position of the National Glass Association or its technical committees

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PHOTOS
MICHAEL MORAN

THE BASICS

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 DESIGN

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.

THE GLASS

Everything in the building, from door handles and floorboards to railings, feels reassuringly solid. Pulp Studio created over 8,700 square feet of flat and bent laminated glass railings and guardrails, chemically strengthened for the tight 8-inch radii specified for the job. Pulp Studio's proprietary Precision Edge® technology was used to post-polish the glass edgework for a refined look using its two-decade-old proven process. In addition, guardrail glass was added with a specially etched, low-iron, laminated glass, finished with a digital design for an enhanced level of privacy and intimacy.

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REFLECTIONS ON MIRROR



ANSWERS TO TOP GLASS INDUSTRY QUESTIONS ON FLAT GLASS MIRROR



The Marcus restaurant at the Four Seasons Montreal Hotel features bronze mirrors throughout its entrance and clear mirror in the main dining space. Walker Glass supplied the mirrors.



The technical services team of the National Glass Association maintains the NGA Codes & Standards Help Center to provide general guidance to its member community. The following is a compilation of inquiries about flat glass mirror. To read more Q&A or to submit a question, visit glass.org/member-help-center (NGA member log-in required).

IS MIRROR GLASS REQUIRED TO BE SAFETY GLAZING?

Yes. Referring to 2021 International Building Code (IBC) Section 2406.1, mirror glass in hazardous locations is required to be safety glazing, except when mounted or hung on a surface that provides a continuous backing support.

For mirror applications, a safe alternative to tempering is to use a "safety backing." The safety backing is an adhesive film made from polypropylene applied to the back surface of the mirror. If impacted, the safety backing will help keep glass shards in place while also helping to control moisture that can cause the mirror to deteriorate.

IS SAFETY BACKING REQUIRED ON MIRRORS THAT ARE MOUNTED LESS THAN 18 INCHES FROM THE GROUND IF IT WILL BE ADHERED TO THE WALL WITH MASTIC?

It depends. The mirror installation could be exempt from safety glazing requirements if the mastic provides a "continuous backing support." Continuous backing support is not defined in the IBC. It could be assumed if the mastic covers the entire back of the mirror without gaps or hollow areas between the mirror and substrate, that may be considered continuous backing support. However, it sounds like a fairly large mirror if it's being mounted less than 18 inches from the ground. Even if technically exempt, especially for tall or large mirrors, it is preferred to have mirrors that will not break into dangerous shards if impacted, so safety backing is recommended.

IS IT REALLY NECESSARY TO USE MECHANICAL SUPPORTS WHEN INSTALLING A MIRROR? CAN AN ADHESIVE BE USED TO MOUNT THE MIRROR INSTEAD?

Mechanical means of installation, such as J-moldings, clips and screws, or framing are recommended for most applications. J-molding should have weep holes. Mirrors should always have a 3-millimeter (0.12-inch) neoprene setting pad between the mirror and clip or molding used. Tapes, adhesives or mastics can be used in addition to mechanical means of installation. If using adhesives in the installation process, use those that are "neutral cure." Ensure that the adhesive selected is compatible with the mirror backing. Avoid adhesives containing strong solvents or acids like acetone, toluene,



An installation featuring UltraMirror from Guardian Glass.

methylene chloride, acetic acid, etc., as these can severely damage mirror backings. Refer to specific adhesive manufacturer's instructions for further information.

CAN MIRROR GLASS BE INSTALLED IN EGRESS DOORS?

The IBC does not permit mirrored glass on egress doors, as egress doors must be easily recognized as points of exit from the building in case of emergency.

HOW SHOULD MIRRORS BE CLEANED?

Care should always be taken to avoid getting the edges of the mirror wet with any liquid or substance. This can result in damage to the mirror edges, commonly called "black edge." Should mirror edges become wet, they should be dried off immediately.

The best cleaner for a mirror is clean, warm water used with a soft, lint-free cloth. Wring all water from the cloth before wiping the mirror. Dry the mirror immediately with a dry lint-free cloth. Don't use acid or alkali cleaners for mirror cleanup after installation. Either substance can attack the front surface and edges as well as the backing of the mirror. Abrasive cleaners are not recommended on any mirror surface.

CAN I RECYCLE BROKEN MIRROR GLASS?

Unfortunately, most community recycling programs can only take standard bottles and jars, not sheet glass, Pyrex or mirror. Instead of throwing old mirrors away, they could be repurposed into new home projects or artwork such as mirror tiles, garden or greenhouse accents, or mosaic applications.

NEW MIRROR MANUAL

The NGA Fabricating Committee has a task group working to compile a Mirror Reference Manual. Learn more about the task group and how to get involved at glass.org/advocacy/get-involved/committees. ■

Learn about additional benefits available to NGA Members

NGA TECHNICAL VOLUNTEERS

Volunteers from the following NGA member companies are working to develop the Mirror Reference Manual. Get involved at glass.org/advocacy/get-involved/committees.

- Guardian Glass
- NSG Group / Pilkington
- Trulite Glass & Aluminum Solutions
- Virginia Glass Products
- Vitro Architectural Glass
- Walker Glass

LEARN MORE ABOUT FLAT GLASS MIRROR FROM THESE ADDITIONAL FREE RESOURCES FROM NGA

Proper Procedures for Cleaning Flat Glass Mirrors (FB06-05)

Proper Procedures for Fabrication of Flat Glass Mirrors (FB22-09)

Proper Procedures for Receiving, Storage and Transportation of Flat Glass Mirrors (FB30-11)

The Reusability and Recyclability of Mirror Products (FB38-14)

Understanding Reflective Distortion in Mirror Installations (FB58-18)

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GLASS MAGAZINE AWARDS 2023

GLASS CAN DO EVE



WINNERS SHOW THAT GLASS IS A MULTIFUNCTIONAL MARVEL

BY NORAH DICK



ERYTHING

The 2023 Glass Magazine Award winners provide incontrovertible proof that glass is beautiful and can do almost anything inside and outside of a building. The seven project and six product award winners represent the full gamut of what glass and metal systems have to offer to the spaces where we live, learn, work and play.

Winning projects and products continue to showcase sustainable and green solutions, including energy efficiency, as well as provide a connection between indoor and outdoor spaces through the use of glass.

Demonstrated in several winning projects, decorative glass continues to be an integral design element, providing color, interest and elegance.

Product award winners continue to emphasize speed and ease of use for a less-skilled labor force, and an industry still facing unpredictable lead times and staffing.

Glass remains structurally important to the exterior as well, as seen in the new awards category this year for "Best Curved Glass." The decision to debut a new category was based on the impressive range of nominated projects that featured curved and bent glass, which speaks to the engineering prowess and innovation of the industry.

No less impressive is the industry expertise that makes this competition possible. The Glass Magazine editorial staff would again like to thank this year's 19 project award judges, who reviewed the nominated projects. We also thank the glass industry voting public for taking the time to select this year's product award winners from the nominations.

We know many companies have outstanding projects and products yet to be completed or released. To participate in next year's Glass Magazine Awards, contact Senior Editor Norah Dick at ndick@glass.org.

PROJECT OF THE YEAR

THE PROJECTS

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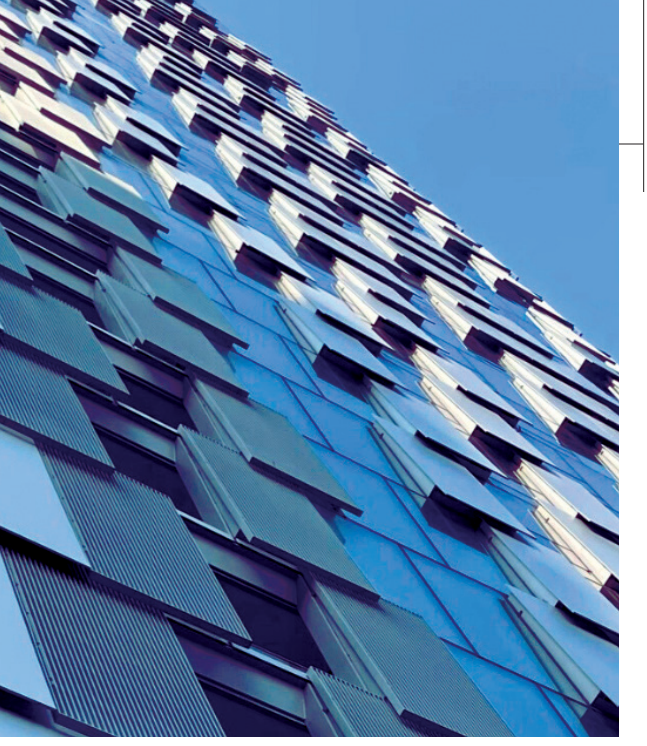


Nominating Companies
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Kuraray

Location
Vancouver

Winning Team
CONTRACT GLAZIER, METAL SYSTEMS MANUFACTURER: Flynn Group of Companies
ARCHITECT: Kengo Kuma & Associates
FAÇADE DESIGNER: RDH
FABRICATED GLASS SUPPLIER: Glass 3 Enterprises
INTERLAYER SUPPLIER: Kuraray
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"FORM, FORM AND FORM. A COMPLEX DESIGN WITH MULTIPLE MATERIALS, SHAPES AND STRUCTURES. TOTALLY BRILLIANT."

Asymmetry meets style in the new 43-story, mixed-use tower that makes a striking addition to the Vancouver skyline. Drawing inspiration from the surrounding environment, the complex façade appears as though it is constantly shifting, incorporating wooded balconies as a natural element.

"Form, form and form. A complex design with multiple materials, shapes and structures. Totally brilliant," says Glass Magazine Awards judge Martin Bracamonte, vice president of marketing and innovation, Vitro Architectural Glass.

"The shape of this building is awesome, and to be able to use glass with this design is phenomenal," says Glass Magazine Awards judge Tom O'Malley, founding partner, director of sales, Clover Architectural Products.

Contract glazier Flynn Group of Companies, working with fabricated glass supplier Glass 3 Enterprises, provided and installed triple insulating glass units to the podium and first few floors of the massive building.

Glass 3 Enterprises supplied several glass systems, including vertical glass fins, the largest measuring 36 by 274 inches. Fins were comprised of four layers of 12-mm low iron, tempered with a 090 SentryGlas interlayer. The company also provided insulating glass units measuring 89 by 226 inches, laminated with Trosifol Clear PVB.

"This project appears to be a strong architectural statement fully integrated with complex engineering implementation at many different scales across the building structure and envelope," says Steve Selkowitz, consultant, Building Technology and Urban Systems Division, Lawrence Berkeley National Laboratory.

Façade designer RDH worked closely with the glass fabricator to ensure quality assurance. "Our team's ability to create an ongoing relationship with the manufacturer has been a significant aspect of the project's production success to date," say RDH officials, on the company's website.

"We were present during the development, testing, and manufacturing stages to provide quality assurance and to support the manufacturer's development of quality control processes. We also managed the design and construction of a performance mockup of the enclosure system to illustrate the standard that must be met during construction."



FIRST RUNNER-UP, PROJECT OF THE YEAR





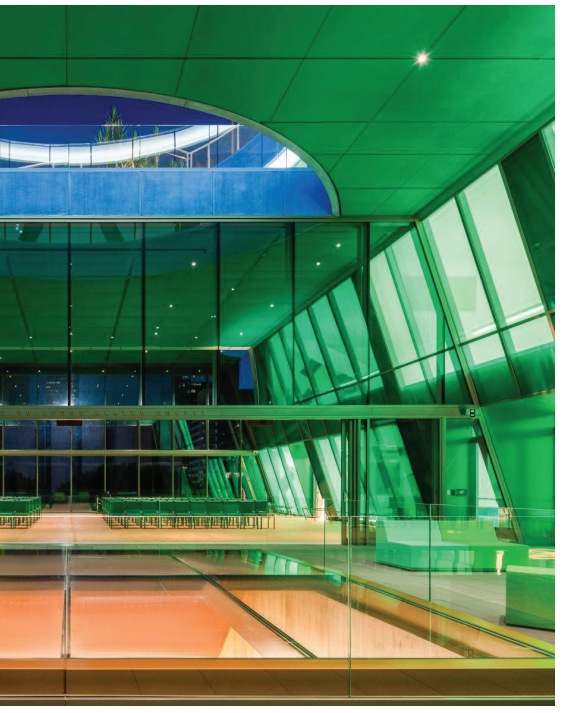
BEST DECORATIVE GLASS APPLICATION

THE AUDREY IRMAS PAVILION

Nominating Companies
Eastman Chemical Co.
Goldray Glass

Location
Los Angeles

Winning Team
ARCHITECT: Shohei Shigematsu, with Gruen Associates of Los Angeles and Office of Metropolitan Architecture
GLAZING CONTRACTOR: Steel City Glass
GLASS LAMINATOR: Goldray Glass
INTERLAYER SUPPLIER: Eastman Chemical Co.
STRUCTURAL ENGINEERING: ARUP
PHOTO CREDIT: Jason O'Rear



"THIS IS AN INCREDIBLY VISUAL AND INTERESTING STRUCTURE THAT REALLY PUTS THE GLASS AT THE FOCAL POINT FOR ANYONE THAT ENTERS."



History and modernity both find expression in the Audrey Irmas Pavilion, a glowing green glass trapezoidal terrace recessed into the side of Wilshire Boulevard Temple's historic Erika J. Glazer Family Campus in Los Angeles. The temple has been a cornerstone of the Jewish community since its opening in 1892.

"This is an incredibly visual and interesting structure that really puts the glass at the focal point for anyone that enters," says Glass Magazine Awards judge Sara Barchak, marketing communications manager, EFCO Corp.

Designed to host religious and cultural activities, celebrations and performances, the 55,000-square-foot, three-story pavilion features three harmonious gathering spaces—each with a distinct scale and spatial character.

Shohei Shigematsu's pavilion design uses the trapezoidal window as a counterpoint pop of color that simultaneously aligns with the design elements of the Byzantine-Revival style building. The dramatic green laminated glass coordinates with the building's dome, while the pavilion's geometric lines, neutral facade dotted with hexagonal shapes and windows, and recessed green glass terrace create a unique contrast to the traditionally styled temple.

The strategic use of green laminated glass ties the three levels of the pavilion together—from the exterior panels visible from Wilshire Boulevard to the interior partitions within the Diane & Guilford Glazer Chapel to the insulating glass units of the West Terrace—while allowing in daylight and providing views of Los Angeles, the Hollywood sign and the mountains north of the city.

Glass Magazine Award judge Jennifer Highfield, Architectural Design Associate, Viracon, noted the impressive eight-layer stack of Vanceva PVB interlayer, which allowed for the signature glowing green glass. The stack was combined with a metal mesh interlayer.

The exterior panels, interior partitions of the Diane & Guilford Glazer Chapel, and the insulating, laminated green glass units in the West Terrace were fabricated by Goldray Glass and installed by Steel City Glass alongside MATT Construction.

▸ BEST PROTECTIVE GLAZING PROJECT

ORLANDO INTERNATIONAL AIRPORT, TERMINAL C



Nominating Company
Tecnoglass, nominated on behalf of Kuraray

Location
Orlando

Winning Team
GLASS FABRICATOR: Tecnoglass
INTERLAYER SUPPLIER: Kuraray
CONTRACT GLAZIER: Physical Security
GLASS SUPPLIER: Architectural Aluminum Techniques
METAL SYSTEM MANUFACTURER: BCI Sun Metals
ARCHITECT: Fentress Architects
PHOTO CREDIT: Greg Angel

Orlando's International Airport now features a new addition: Terminal C, representing a $2.8 billion investment, with 15 gates serving 10-to-12-million passengers annually. And, located as it is in Orlando, hurricane resistance and impact ratings are a major concern for glass systems.

"We all know Florida sets standards for protective glazing, [and] the scope of the Orlando Airport project clearly makes it a winner," says Glass Magazine Award judge Pete de Gorter, vice president, DeGorter Inc.

Glass fabricator Tecnoglass selected Kuraray's SentryGlas to meet standards and certifications, including Florida Product Approval and Notice of Acceptance High Velocity Hurricane Zone (NOA – HVHZ) for Miami-Dade County and Broward County.

"Working with Tecnoglass has been a collaborative and synergistic experience for a very long time. With their expertise in designing glass systems and a deep understanding of the technical requirements for hurricane glazing, we supply interlayers that meet their exact needs," says Tameca Triplett, marketing communications coordinator, Kuraray.

The exterior facade and interior railings were both glazed with 0.060 SentryGlas. Kuraray officials worked closely with Tecnoglass as the fabricator conducted air, water and structural testing, as well as impact and cyclic load tests to ensure that the system's performance aligns with the stringent regulations of Miami-Dade County.

Glass Magazine Award judge Nataline Lomedico, president and CEO, Giroux Glass, also recognized the project's sustainability strategies, including water-reduction features, solar panels, responsive lighting, and the use of nontoxic and natural materials.

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BEST PROJECT TEAM

BOLEY ELEMENTARY SCHOOL





The new daylit and colorful interior of Boley Elementary School complements the heart-warming story of this project, winner of the "Best Project Team" award. After a fire destroyed the school in 2019, the local school board worked to get the school rebuilt as quickly as possible. Officials from TBA Studios, an architecture firm located only two miles from the school, say they felt obligated to help the students and teachers get back to learning as soon as possible.

To complete the rebuild by the start of the 2023 school year, the firm had to work quickly, and closely, with other stakeholders. "Working closely with the contractor and the owner throughout the entire construction process allowed TBA to ensure a tighter schedule while also ensuring quality design and giving back Boley the best school it could be after such devastation," say officials from TBA Studio.

Daylight, and therefore





Nominating Company
TBA Studio

Location
West Munroe, Louisiana

Winning Team
GLASS MANUFACTURER: Vitro Architectural Glass
INTERLAYER SUPPLIER: Eastman Chemical Co.
CONTRACT GLAZIER: ACME Glass and Mirror
ARCHITECT: TBA Studio
PHOTO CREDIT: Matthew Cassity

glass, was integral to the design. Large spaces, like the library, were designed facing North to allow light to flood the space without glare or high heat gain. "The use of light entering the building was important to TBA and the client to ensure that natural light entered to create a bright, welcoming and happier school," say TBA officials.

Pops of color, accomplished with Eastman Chemical Co.'s Vanceva interlayers, highlight several rooms in the new building. "The rooms are filled with colors promoting playfulness and positivity, which are ideal for elementary school environments," officials say.

"Nothing says 'team' like experts helping get their own community back on their feet. Loved the open spaces, color laminated glass and natural lighting. Loved the sense of community even more," says Glass Magazine Awards judge Pete de Gorter, vice president, DeGorter Inc.

BEST GREEN PROJECT

CENTER OF DEVELOPING ENTREPRENEURS







Nominating Company
Kawneer

Location
Charlottesville, Virginia

Winning Team
GLASS MANUFACTURER: Guardian Glass
ALUMINUM SYSTEMS: Kawneer Co.
CONTRACT GLAZIER: Glass and Metals Inc.
GLASS FABRICATOR: Rochester Insulated Glass
ARCHITECTS: Wolf Ackerman, Eskew Dumez Ripple
PHOTO CREDIT: Alan Karchmer

Being green can be good for business—quite literally, in the case of the new Center of Developing Entrepreneurs, or CODE, which features outdoor and flexible community and office spaces for established and emerging businesses. Also green in architectural design, CODE aims to be LEED Gold certified, and several of nominating company Kawneer's thermally broken systems helped the project take home the "Best Green Project" award this year.

"The intermixing of live foliage on rooftops and the many other sustainable features really puts this project above the rest," says Glass Magazine Awards judge Sara Barchak, marketing communications manager, EFCO Corp.

Designed to meet AIA's 2030 efficiency and thermal performance challenge, the architectural team and specialty engineering consultants ran an intensive energy model during the design process, say Kawneer officials. "All façade elements are integrated into a thermally broken, insulated metal panel layer," say Kawneer officials. "At the same time, the planes of insulating glass line up with the plane of building insulation. Jam anchors allowed the plane of insulation to be unbroken between window and facade insulation, avoiding a thermal bridge."

Located in downtown Charlottesville, Virginia, the building envelope design draws from the brick cladding and punched window openings of the surrounding historical context but is implemented with a modern rain screen to achieve high levels of insulation and thermal performance while providing defense-in-depth against water intrusion, say officials from Kawneer.

Relying on passive design, operable windows combine with the building's orientation to draw cool breezes from the mountains and funnel them through the narrow floorplate. Analysis estimates that 40% of the year, the building should require neither cooling nor heating, says the company.





BEST CURVED GLASS

JEFFERSON HEALTH HONICKMAN CENTER

Nominating Company
Cristacurva

Location
Philadelphia

Winning Team
ARCHITECTS: ENNEAD Architects, Stantec
BUILDING ENCLOSURE CONSULTANT: Heintges

TOWER
CONTRACT GLAZIER: New Hudson Facades
GLASS MANUFACTURER: AGC Europe
CURVED GLASS FABRICATOR: Cristacurva
FLAT GLASS FABRICATOR: Interpane-AGC

STOREFRONT
CONTRACT GLAZIER: National Glass and Metal
GLASS MANUFACTURER: Guardian Glass
GLASS FABRICATOR: Cristacurva
PHOTO CREDIT: Torsten Zech

A 20-story medical facility located in central Philadelphia, the new Jefferson Health Honickman Center features a rippling façade with curved glass fabricated by Cristacurva. It is this year's winner in a new category, "Best Curved Glass."

Glass Magazine Awards judge Jacob Kasbrick, commercial segment and technical services manager, Guardian Glass, praised the façade's unique aesthetics. "The tower façade has constant movement from the bent [insulating glass units], unlike most buildings, which use a corner to accent the bent aesthetic," he says. "The color consistency from the tower glass in reflection was nicely balanced as normally extreme angles could provide undesirable reflected colors, while this façade looks very uniform and inviting."

The undulating façade was designed to be textured, says Gabriela Dávila, marketing, Cristacurva, with flat glass adjacent to curved concave units. Achieving a low-emissivity coating on surface No. 2 of the concave curved units is courtesy of a breakthrough technology that the company developed a few years ago, says Dávila.

"Before this new technology was available, the only way to have curved concave glass was to make curved convex glass and flip it inside-out," says Dávila. "On monolithic or uncoated assemblies, this is not an issue, but when there is a high-performance low-e coating, it was a problem because it meant that the coating would be on surface No. 3 of the [insulating glass unit] instead of surface No. 2.

"Most coatings don't look and perform the same on surface No. 2, so this created visual inconsistencies and created a detrimental impact on the wall performance," Dávila says. Since the company's innovation, bending glass concave with a surface No. 2 low-e coating is possible.

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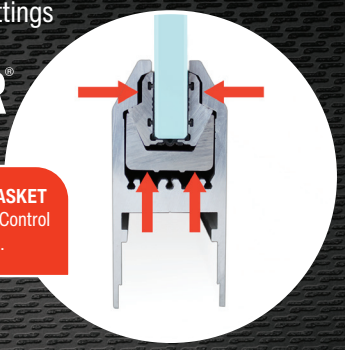
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▸BEST GLASS INTERIOR

DAVID GEFFEN HALL

Described as “the new cultural home for New York” by Lincoln Center officials, the new David Geffen Hall is the home of the New York Philharmonic Orchestra. Pulp Studio’s polished and carefully etched bent railing and guardrails complement the elegant intimacy of the new performing arts center, and helped it win this year’s “Best Glass Interior” award. “These are the most beautiful railings I’ve ever seen,” says Glass Magazine Awards judge Martin Bracamonte, vice president of marketing and innovation, Vitro Architectural Glass. “A brilliant and elegant use of glass.”

The fabricator created over 8,700 square feet of flat and bent laminated glass railings and guardrails. Pulp Studio solved the problem of bending glass for the tight, 8-inch radii specified for the project through its chemical strengthening process. “Pulp Studio’s chemically strengthened glass is stronger, more durable and more versatile than traditional thermal bending,” explains Kirk Johnson, COO, Pulp Studio. Using the process, the fabricator bent the glass without undermining the strength of the glass itself.

Guardrail glass used specially etched low-iron laminated glass, finished with a digital design for enhanced privacy and intimacy. Using its Precision Edge technology, the fabricator also applied post-polish to the glass edgework, completing the refined look. “The exposed edges on glass handrails are an aesthetic detail that shouldn't be overlooked,” says Johnson. “Codes only require that handrail glass be laminated, but high-quality edgework is imperative for the integrity of the design.”

Judges praised the impressive technical feat of bending glass and the aesthetic achievement. “Normally, a handrail is an afterthought whereas the aesthetics of the acid etch handrail make the glass a focal point,” says Glass Magazine Awards judge Jacob Kasbrick, commercial segment and technical services manager, Guardian Glass



Nominating Company
Pulp Studio

Location
New York City

Winning Team
ARCHITECTS: Tod Williams Billie Tsien Architects; Diamond Schmitt
CONTRACT GLAZIER: Lafayette Metal & Glass Co. in Hauppauge, NY
GLASS FABRICATOR: Pulp Studio
ACOUSTIC DESIGN: Akustiks LLC
PHOTO CREDIT: Michael Moran/OTTO

THE JUDGES

The project awards would not be possible without the expertise of our judges, who come from every part of the glass industry. The Glass Magazine editorial team again thanks them for taking the time to share their insights with us.



Mary Avery
Vice President of Marketing, Tubelite



Sara Barchak
Marketing Communications Manager, EFCO Corp.



Martin Bracamonte
Vice President of Marketing and Innovation, Vitro Architectural Glass



Tara Brummet
Chief of Staff, Vitrum Glass, Apex Aluminum & Lorval Developments



Peter de Gorter
Vice President, DeGorter Inc.



Alice Dickerson
Founder and Managing Director, Division 08 Marketing



Ricardo Dominguez
President, Jordon Glass Machinery



Jennifer Highfield
Architectural Design Associate, Viracon



Jacob Kasbrick
Guardian Glass Commercial Segment and Technical Services Manager, Guardian Industries



Nataline A. Lomedico
CEO and President, Giroux Glass Inc.



Kayla Natividad
Architectural Technical Services Engineer, NSG Pilkington



Tom O'Malley
Founding partner and Director of Sales, Clover Architectural Products



Jessie Robertson
Marketing Manager, Steel Encounters



Diana San Diego
Vice President of Marketing, Safti First



Julie Schimmelpenningh
Global Applications Manager, Eastman Chemical Co.



Tammy Schroeder
Director of Marketing, Linetec



Stephen Selkowitz
Affiliate, Lawrence Berkeley National Laboratory

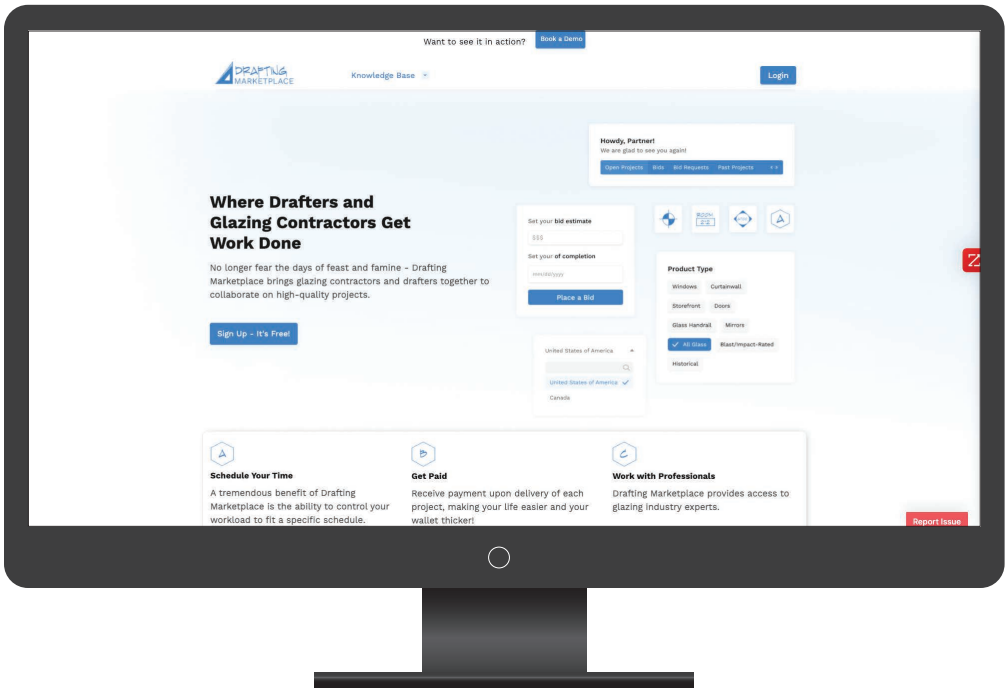


Syndi Sim
Vice President of Marketing and Business Development, Diamon-Fusion International



John R. Stephenson
Senior Architect, BRPH

THE PRODUCTS



▸ R&D AWARD

DRAFTINGMARKETPLACE.COM

BY DRAFTINGMARKETPLACE.COM

This year's "R&D Award" winner has a unique origin story. Brandon Bellegarde combined his software and marketing expertise with the 20 years of drafting experience of his lifelong friend Tyler Faulk to create DraftingMarketPlace.com. The online platform is designed to make sourcing quality shop drawings faster and easier.

The platform was created in response to Faulk's frustrations with the daily challenges of being a drafter in the glass industry. To provide better tools, the pair sat down with their team to prioritize the challenges they wanted to solve. "We then began developing programmatic solutions, using the minimum viable product and scrum approach to software development," say Bellegarde and Faulk. "Once the base product was developed, we began the beta test phase that lasted around two years."

To use the tool, glazing contractors post projects—containing quotes, architectural drawings, hardware schedules and other information—on the platform. Then drafters bid for the opportunity to complete the shop drawings. As glazing contractors receive bids for their projects, they individually review each drafter and their bid to determine the drafter or drafting company best suited for the project.

They continued to beta test the platform with drafters and glazing contractors across the country, until they released it to the public at Glassbuild 2022. "We conducted interviews, collected feedback and modified designs along the way until we had a product we were comfortable releasing to market," they say.



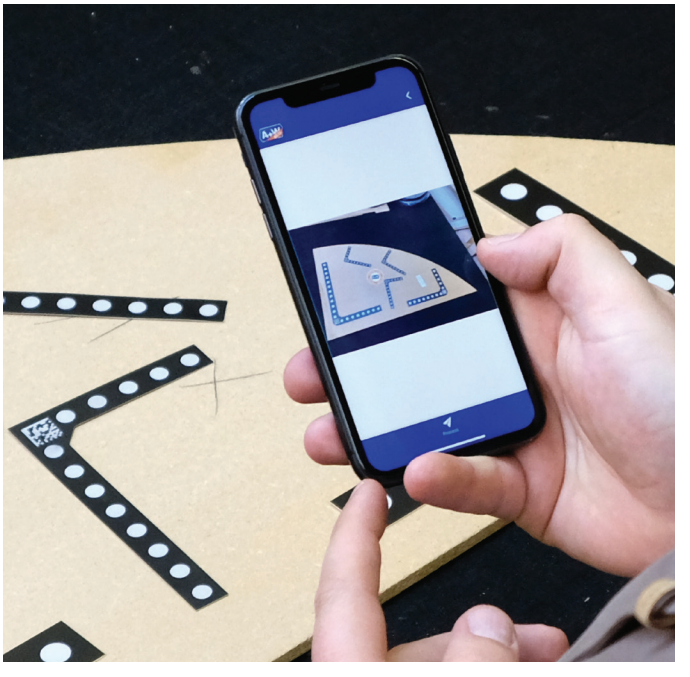


Photo by Michael Kuettner

BEST INNOVATION FOR THE FACTORY

A+W iSHAPE

BY A+W SOFTWARE

Speed is highly valued, especially now as supply chain delays lengthen lead times. A+W Software's iShape application, this year's "Best Innovation for the Factory" winner, aims to speed up the templating process with a template-digitizing software solution.

Glass fabricators can find it time-consuming and difficult to accurately and efficiently convert regularly supplied templates to cut glass, says Chris Kammer, marketing lead, A+W Software. The iShape app, which uses Viprotron technology, allows glass fabricators to photograph customer templates with their smartphone camera. iShape accurately assesses finite radiuses and subtle shape variations on a given template with custom QR-coded L-angles that assist the software in shape reference, says Kammer.

"Even your customers and staff can photograph templates on-site, reducing travel and service times," says Kammer.

The iShape app analyzes the template image and provides a confidence factor to achieve the desired tolerance on the shape within 1 millimeter. The processing power of A+W's cloud backend gives customers a digital twin of their templates to smooth out unintended imperfections.

The app supports Android and iOS devices with modern camera configurations . The company can guarantee an accuracy of 1 centimeter per square meter to the template size, and provides hints for the user in the digitalization process.



BEST HARDWARE PRODUCT OR SYSTEM

OCULA FRAMELESS WINDSCREEN

BY SIGHTLINE COMMERCIAL SOLUTIONS

In Sightline Commercial Solutions' Ocula Frameless Windscreen, this year's winner for "Best Hardware Product or System," hardware is minimal but crucial. Manufacturers designed this glass windscreen system to be post-free. "Unlike traditional glass windscreens that require installers to lift large panes of glass and slide them in from the top of the post system, Ocula glass panels are mounted with baseplates and an escutcheon cover," says Jon Chase, vice president of engineering and marketing, Sightline Commercial Solutions. This helps to reduce installation time and reduce costs, he says.

Chase says the system responds to the "all things al fresco" trend–i.e., incorporating outdoor areas into hospitality, health care and high-rise projects. "It makes outdoor areas more useful and allows architects to create open, airy environments without sacrificing the very thing that draws people outside in the first place–the views."

To provide these unobstructed outdoor views while still protecting occupants from wind and rain, manufacturers minimized metal members of the system. "This post-free design created localized stress on the glass panels, requiring a thorough finite element analysis review to confirm the product would safely withstand various applications and structural considerations, such as live loads, seismic actions and wind loading," says Chase.

Sightline's Ocula can withstand wind loads up to 86 pounds per square inch at a guardrail height of 43 inches.

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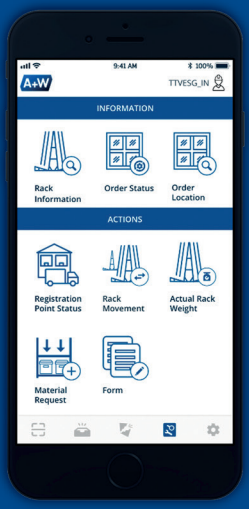
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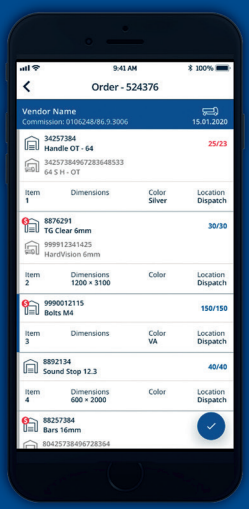
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▸BEST GLASS OR GLASS COMPONENT

SUNGUARD SUPERNEUTRAL SNR 35

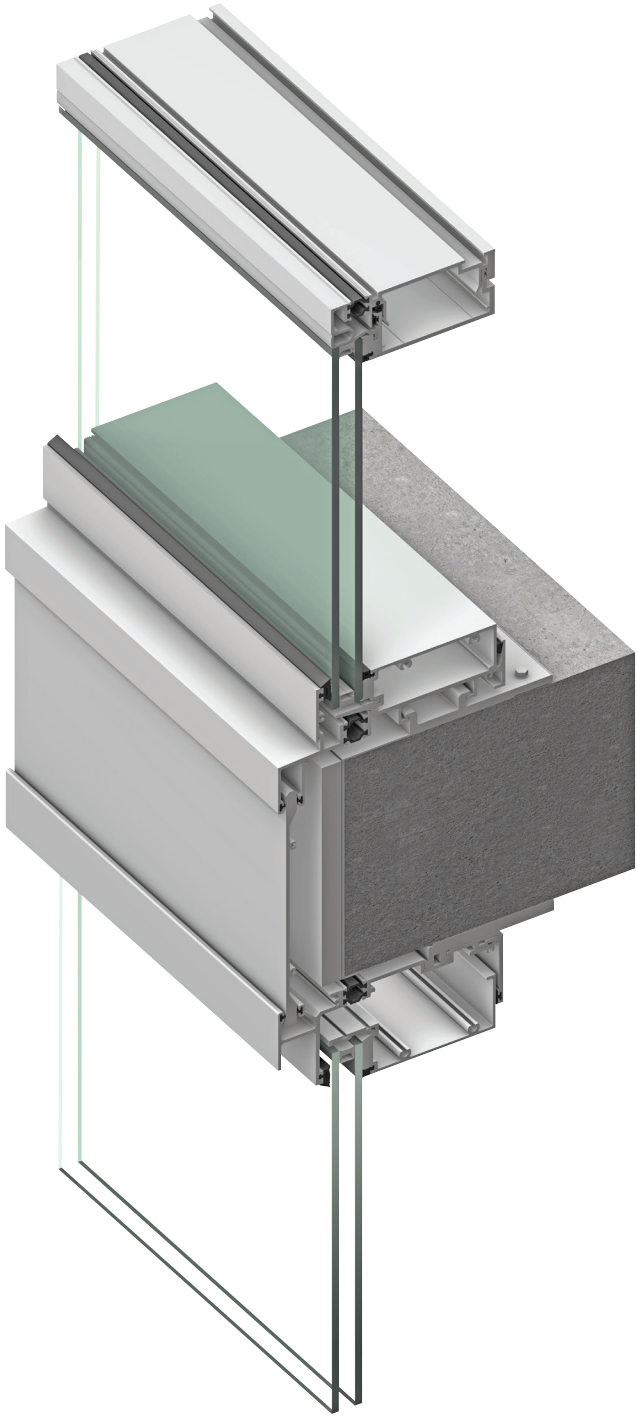
BY GUARDIAN GLASS

Guardian Glass' SunGuard SuperNeutral SNR 35 coated glass, this year's winner for "Best Glass or Glass Component," combines aesthetics and performance, the pinnacle of achievement for any new architectural glass.

SNR 35 provides architects with a classical, neutral silver aesthetic, both at normal and angular incidence, with excellent energy performance led by a low solar heat gain coefficient of 0.17. The result is an architectural glass designed to allow attractive building exteriors and bright, comfortable interiors.

Developed at the same time as the company's SNR 50 glass (last year's winner in this category), the glass manufacturer sought architect input at multiple stages. The development team shared glass samples with architects for feedback. "With multiple mock-up viewings, the research and development team and plant team were able to tweak the product to deliver the broadest market appeal," says Jacob Kasbrick, commercial segment and technical services manager, Guardian Glass.

The SNR 35 coating is designed for the No. 2 surface of a standard insulating glass unit. This coating can be paired with various substrates at the following thicknesses: 5-millimeter to 12-mm, Clear and UltraClear low-iron glass; and 6-mm to 10-mm, Green and CrystalGray glass. The product is available in jumbo sizes as well.



BEST FRAMING SYSTEM OR COMPONENT

950SG SERIES THERML=BLOCK WINDOW WALL SYSTEM

BY TUBELITE

Tubelite describes its 950SG Series Therml=Block Window Wall system as providing "the look of curtain wall with the economy of slab-to-slab framing in mid- to high-rise commercial buildings." This year's winner for "Best Framing System or Component," the product offers a four-side, structural sealant glazed window wall that provides a thermally broken, aluminum framing solution for between-slab horizontal spans on commercial buildings.

Beyond aesthetics, the 950SG offers performance criteria: a U-factor of up to 0.33 and a frame condensation resistance factor of 82 per AAMA 1503. The system also meets acoustic, air, water and structural performance standards.

Tubelite's new window wall also aims to reduce installation time. With fewer parts and steps, the systems are installed entirely from the building's interior. A vertical, extruded silicone gasket eliminates the need for an exterior-applied wet seal, and a single-piece, anti-buckling clip simplifies installation.

▸INNOVATION FOR INSTALLERS

ACHIEVE FGR FRAMELESS GLASS RAILING SYSTEMS

BY FRAMELESS HARDWARE CO.



FHC's new Achieve FGR frameless glass railing systems significantly streamline the installation process, making it an understandable win for this year's "Best Innovation for Installers." The dry attachment system avoids traditional expansion cement, and allows for adjustment and easy removal, say officials.

Installation involves the company's "One Seal" 1SGA gasket, which field workers can pre-load before setting glass. They can then use the same gasket on the inside to finish the installation, allowing installers to stock fewer SKUs. Further speeding installation, the system is 40% lighter than a traditional base shoe.

Achieve was also designed to optimize and reduce stress on monolithic and laminated tempered glass and can accommodate heavy glass railing and windscreen applications. Custom fabrication is possible, and the product is available in 10- and 20-foot options, drilled or undrilled. Achieve is compatible with ½-inch tempered monolithic, and $^{9}/_{16}$-inch, $^{11}/_{16}$-inch and $^{13}/_{16}$-inch tempered laminated glass. ■

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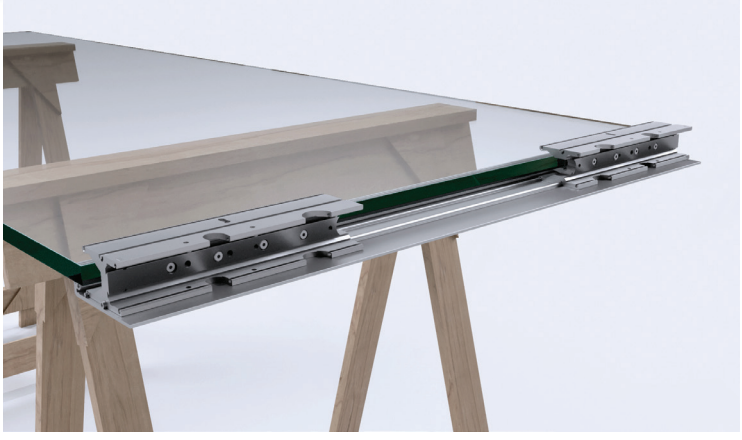
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The CRL DRX™ Modular Door Rail System comprises independent parts, including rail bodies, adjustable slide block, side covers, gasket and end caps. DRX component parts can be attached to the glass as soon as it's fabricated to eliminate lead times on custom doors. Photos courtesy of CRL.

INNOVATION BOOSTED BY VIGOROUS TESTING

IN-HOUSE PRODUCT TESTING MOVES THE NEEDLE TOWARD MODULAR SOLUTIONS

BY TARA LUKASIK
MANAGING EDITOR

A vital component of the innovation process, in-house product testing helps companies enhance product quality, iterate on designs, streamline development cycles, protect intellectual property and foster a culture of invention. The insights gained can be leveraged to help continuously improve a company's products and deliver innovative solutions to meet customer needs.

CRL is a leading provider of architectural metals, glass fittings and professional-grade glazing supplies required by professional glaziers and glass shops to complete the installation of architectural glass in both commercial and residential markets. With a reputation for quality and expertise, the company's innovative designs, subjected to rigorous in-house product testing and certification, offer modern aesthetics to the glazing and architectural hardware industries, as well as new approaches to product design that address the industry's need to complete projects on ever-shortening timelines.

In June, I was able to sit down with Mark Suehiro, technical director, architectural hardware, at CRL to discuss the company's process to identifying areas for innovation, its in-house design testing, and some of the leading product trends they're seeing, including a move to modular solutions to address tight installation timeframes.

Here are some highlights of my conversation with Suehiro.

As both a designer and manufacturer of products, what is the company's process to identifying areas for innovation?

CRL's approach is based on listening. We go to great lengths to understand the challenges, large and small, that our glazing partners and their customers are dealing with. Sometimes the issues are business related, such as the need to increase efficiencies or meet ever-shortening installation deadlines. Sometimes the issues are technical and product focused. Occasionally, these issues are combined, requiring an approach that solves a business issue through a completely new product or design approach.

Tell us about the role of design and testing in the innovation process.

We don't outsource the design process. It's critical that our in-house staff—engineers and designers—collaborate with our product, sales and manufacturing teams. This enables us to maintain a laser focus on the problem throughout the design phase, ensuring the solution is usable, while accounting for manufacturing considerations that make the solution viable in the marketplace.

We also insist on handle testing in-house, with nearly 4,000 square feet of space in our [Los Angeles, California] facility dedicated to putting our products through their paces. The real world is an unforgiving crucible for testing the operation and durability of mechanical parts. There is simply no technical or theoretical substitute for thorough, real-world testing of new innovations.

What part does customer feedback from contractors and installers play in the innovation product testing process?

CRL constantly seeks input from glaziers as well as the architects, interior designers and building owners they serve, to assess current needs and to evaluate how our solutions address those needs. We also monitor feedback from our customers, and our expert contractors and installers. Their feedback is critical as it emphasizes real-world applications. Glazier and customer feedback informs all of our solutions, making them more usable and more valuable.

Let's talk trends. What are the leading product trends you're seeing in the industry? How is CRL innovating to meet these changing needs?

Labor issues continue to plague the glazing industry. Our glazing customers simply can't find enough qualified, skilled professionals to fill their ranks. We are constantly researching and considering process and product improvements that will address issues precipitated by the shortage of skilled labor, which is compounded by ongoing, industry-wide supply chain and inventory bottlenecks that cause project delays.

Other trends deal with products that help speed up the installation process, whether it's unitized systems or modular systems that cut down on lead times.

We're seeing a trend toward product modularization. Can you speak to how this is affecting your customers?

Recently, glazers have begun dealing with a different business problem—extended fabrication timeframes for custom commercial glass doors, which delays installations. Waiting for the manufacture of custom doors or even unitized products—prefabricated products like curtain walls that are manufactured in a controlled factory environment, then shipped to the job site as pre-glazed units ready for installation—can put entire projects behind schedule. A new approach to the product—a modular approach—was the innovation needed to address this business problem.

The new CRL DRX Modular Door Rail System deconstructs a standard door rail into independent parts giving glass temperers and glazing contractors greater control over when, where and how door rails are installed, adjusted and updated. Unlike standard door rails, the DRX system features independent side covers and end caps that can be easily installed or replaced without having to remove the door from the pivot. The system also features 10 ½-inch-length rail bodies that can be moved along the glass to accommodate standard or custom door lengths. Because of this, they can be stocked to virtually eliminate lead times for installing custom glass doors.

What part does in-house product testing play in maintaining quality and determining the lifespan of your products?

Testing plays a central role in new product development. We make sure our products are up to code and meet or exceed industry testing standards by staying on top of industry developments and applying the latest testing equipment. Each new product—including our latest innovation, the CRL DRX Modular Door Rail—benefits from rigorous testing and strenuous protocols. The DRX has been tested to 500,000 cycles to ensure lasting durability, and it features a superior glass clamping force, able to withstand a pull force test of 1,300 pounds.

This really sets us apart because we focus not only on meeting current customer challenges but anticipating future challenges that may arise through changing industry dynamics. ■

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SOLUTION: SOLID B HINGE

Aluminum profiles have grown in popularity in the commercial sector, and so has the need for hardware aesthetically and functionally compatible with this trend.

Roto designed the Solid B butt hinges for hinged aluminum doors to fit this need. The Solid B line consists of two- and three-part clampable butt hinges that can accommodate aluminum doors up to 265 and 352 pounds. The hinge fixing can be adapted to match the profile groove, making the Solid B hinge extremely versatile. Our load-bearing components are also made from extruded aluminum for greater stability and dependability.

The slim, 24-millimeter (0.94-inch) diameter design allows the hinges to integrate seamlessly into aluminum doors, adhering to the modern aesthetic of the aluminum profile trend. The hinge also stays in vertical parallel alignment after adjustment. A wide range of colors and different coating methods, including custom coating, grant greater design freedom.

Installation of these hinges is fast and straightforward thanks to the preassembled clamping blocks on the sash hinge and clamping plate on the frame hinge. The high-quality self-lubricating vinyl brushing also allows for easy maintenance, making the Solid B hinges simple, reliable and durable while maintaining the slim, modern aesthetic of the aluminum sector.

Learn more at rotonorthamerica.com, 800/243-0893. ■

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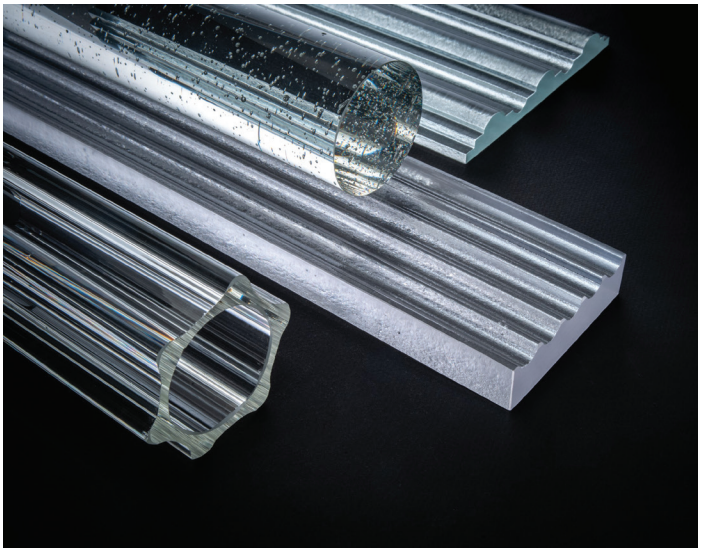
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- INTEGRATED ADJUSTMENT MECHANISMS IN THE ROLLER
- PRE-ASSEMBLED CLAMPING BLOCK ALLOWS QUICK INSTALLATION
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01



02

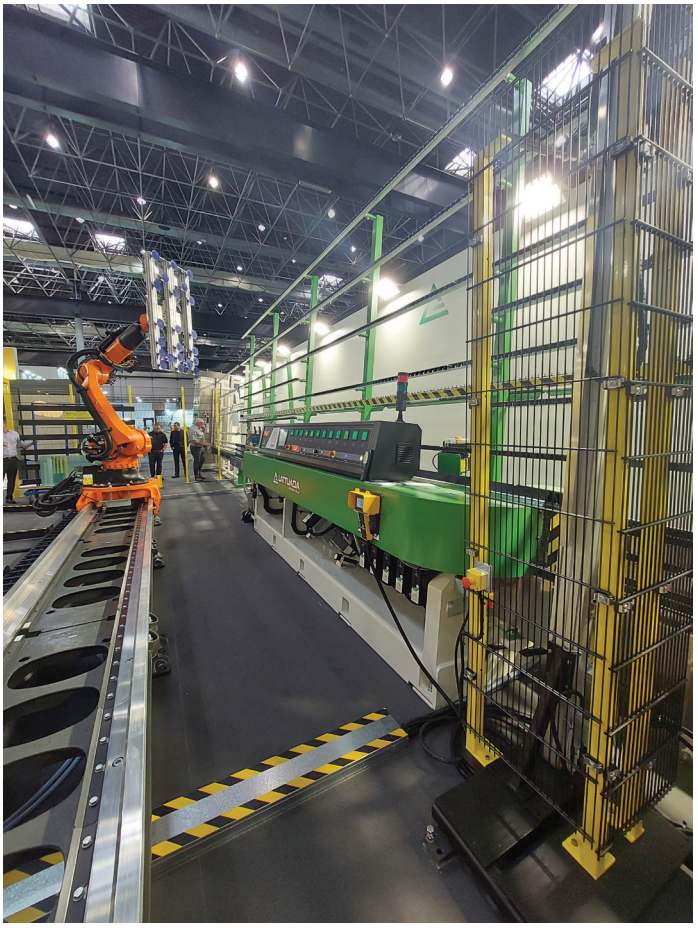


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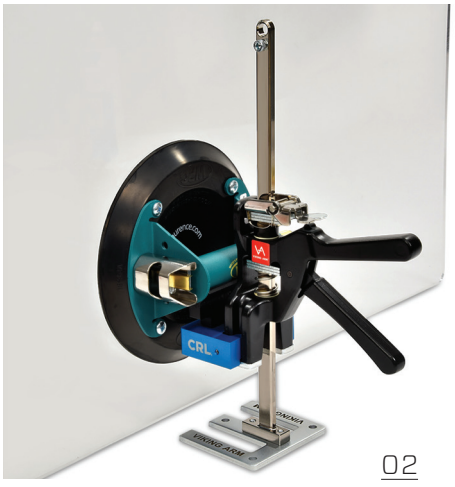
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The latest generation of SANCO Phon insulating glass offers appropriate solutions for the various noise protection zones surrounding airports and noticeably improves the quality of living spaces. In addition to providing thermal insulation, the glass reduces noise pollution by 42 decibels.
+(49) 0731-4096-147 | SANCO.DE

02. Glass sample kit
Vitro Architectural Glass introduced a new Advanced Low-Emissivity Glass Sample Kit featuring Vitro's range of Solarban solar control, low-e glass products for comparison. Each product sample in the sample kit features a solar heat gain coefficient of 0.25 or less and is designed to reduce the transmittance of heat energy from the sun. Applications include façade designs requiring daylighting control.
412/820-8500 | VITROGLAZINGS.COM

03. Glass moldings
These architectural cast glass moldings by Jockimo can help create a decorative focal point in any high-end interior, like in a window display at a boutique or framing a fireplace in the lobby of a hotel. There are six pre-designed, standard molding options. These standard offerings can also be fully customized, or customers can start from scratch and choose shape, size, color and finish.
949/251-0075 | JOCKIMO.COM



01



02



03

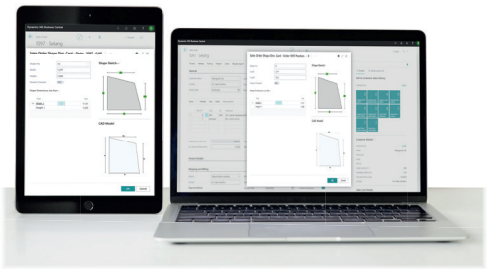
01. Robotic line
A new Lattuada-Knittel robotic solution offers one polisher and one robot on a track. This line is for customers who want to increase the automation level of their edging department. Before loading the glass, this device can check the position of the edge for safe and smooth loading. The line can be operated by an operator who only must load a rack and start the line. After that, all glasses will be automatically ground on four sides.
+(39) 0331-8327-13 | ADELIOLATTUADA.COM

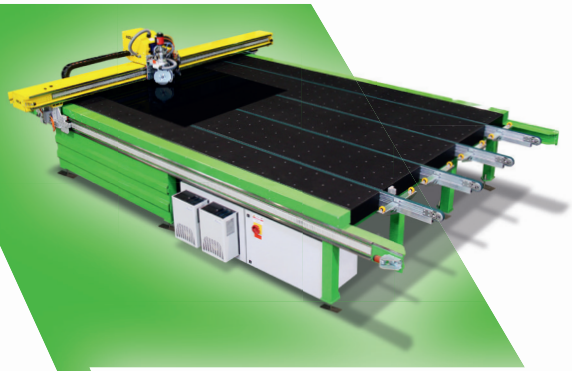
02. Glass installation tool
The GP3100 Viking Glass pane place and position tool attachment, new from C.R. Laurence, can lift and position panes up to 330 pounds, aiming to be safer, more efficient and have more precise installations, say company officials.
It is designed for precision lifting and positioning of large-format glass, is meant for use with any standard glass vacuum cup and features incremental lowering. It can accommodate shower doors, railings, windscreens, office partitions and doors.
800/421-6144 | CRLAURENCE.COM

03. Stationary louvers
Louver type K604 featuring a 4-inch frame depth and louver type K606 featuring a 6-inch frame depth are extruded aluminum stationary louvers by Airolite. These are ideal for applications requiring intake and exhaust ventilation with moderate protection against water penetration. Their design incorporates non-drainable blades, sloped sill and hidden vertical mullions when configured as multiple sections. A variety of options, accessories and architectural finishes are available.
715/841-8757 | AIROLITE.COM

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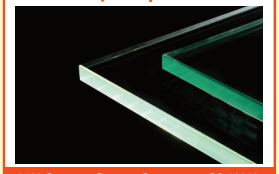
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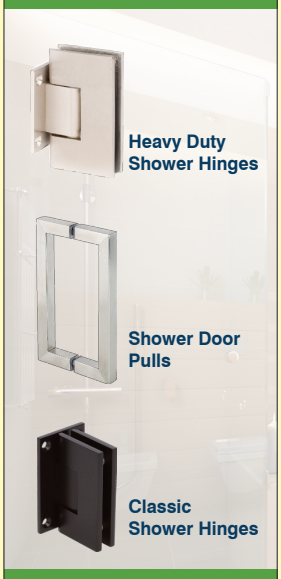
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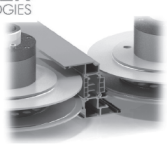
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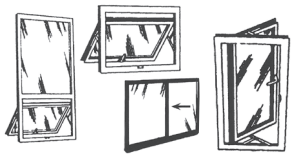
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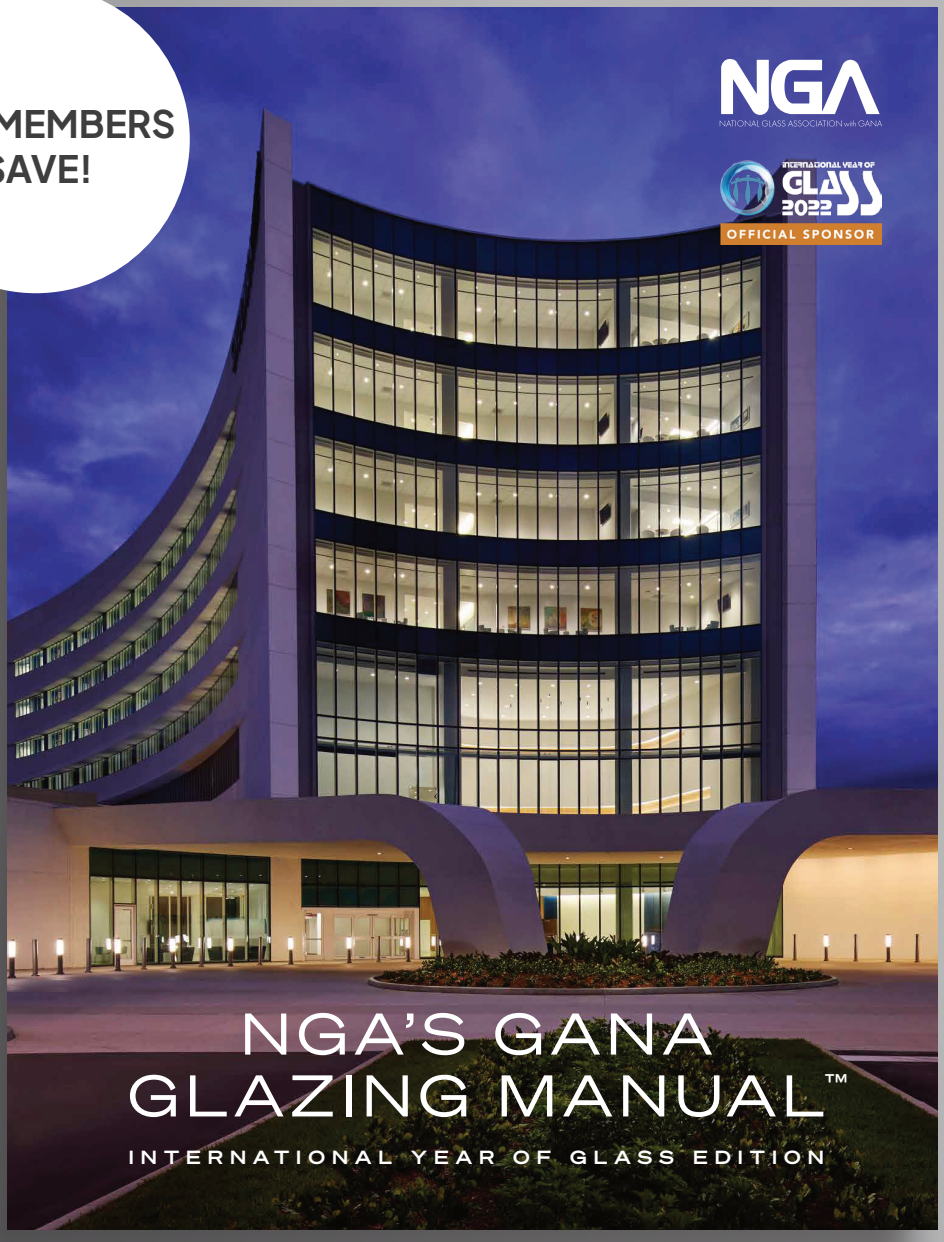
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Companies from all parts of the glass and glazing industry have implemented innovative, out-of-the-box ideas to improve business from the ground up. Here's an Idea showcases these sometimes small behind-the-scenes ideas that can make a big impact on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





REPURPOSING UNWANTED GLASS

Left: A designer for an apartment complex in California changed the specifications for the shower doors at the last minute, after they had already been shipped. This is a rendering of the shower doors. **Right:** The rain-pattern shower glass was repurposed for a "She Shed" residential structure.

Repurposed Materials Inc. calls itself an "industrial thrift store," according to Founder and President Damon Carson. The company finds new homes for the "cast-offs and discards of American industry," including glass. They have six warehouses across the U.S. that are about a one-day truck drive from anywhere in the country, give or take.

Without a national glass recycling infrastructure, the company offers an opportunity to reuse and repurpose architectural glass.

How it works

Companies call Repurposed Materials and let them know what materials they have that are not needed or wanted. Sometimes businesses or people replace the old glass or order the wrong sizes and cannot return them, but they want to keep the glass out of a landfill. Repurposed Materials picks it up and then stores it in a warehouse until someone else, whether an individual or another company, calls them or checks their website to see if they have a particular material available.

One example is an Apple store in Palo Alto, California, which had 7-by-30-foot glass atrium skylights that were being replaced with new ones. Apple's subcontractors contacted Repurposed Materials to keep this glass out of a landfill. Repurposed Materials then brought four semi-trucks to Palo Alto, picked up the crates of glass and brought them to their Arizona warehouse.

Those 14 pieces of glass were rehomed over three months. Ten pieces went to someone in Washington building a large sustainable home, and the other four went to an organic winery in North Carolina.

How it's helping

"One of the questions we often hear is, 'Does repurposing make more sense environmentally or economically?' For companies like Apple, it makes sense environmentally because we're helping them divert their unwanted materials from the landfill," says Carson. "For our customer base, it makes economic sense; they typically save 50% to 75% over buying that same product or material new."

Hopes moving forward

"We would love to help more glass manufacturers, distributors, glaziers and architects because it is interesting to me that within the U.S. glass industry there's a lot of unwanted glass that comes in for all kinds of different reasons," says Carson.

"'It doesn't fit this project,' 'it was a half-inch too long,' 'it's a half-inch too short,' 'they want this tempering now instead of this tempering'—these are some of the reasons people need to rehome glass," says Carson. "Then there are six crates of glass that don't fit the new specifications. In that situation, we could be a resource over time to the industry." ■

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