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Winco Window Thinks Big with Micro-housing

**On the cover:** Digitally printed glass and vertical fins create dynamic waves across the façade of the new 12-story Brooklyn Health Center. Glass Magazine Top Glass Fabricator Viracon, [viracon.com](http://viracon.com), fabricated more than 50,000 square feet of insulating glass for the complex curtain wall, including 22,000 square feet of its DigitalDistinctions decorative glass. Read more about how the team managed demands for precise printing over differently shaped lites on page 38. For the full Top Glass Fabricators report, including a pull-out map of fabrication locations from the nearly 70 2018 Top Glass Fabricators, see page 32. For an interactive, searchable map and downloadable database of the 2018 Top Glass Fabricators, visit [WorldofGlassMap.com](http://WorldofGlassMap.com). Photo © Terry Wieckert, Abstract Photography.

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### Great Glazing projects

Featured in e-glass weekly. To submit projects, write Bethany Stough at [bstough@glass.org](mailto:bstough@glass.org).

- Slate (pictured)
- Museum of the American Revolution
- Four Seasons Lobby, Houston



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- e-glass weekly
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## Most-clicked News Stories on GlassMagazine.com\*

### AGC Begins Installation of New Coater

AGC Glass, [agcglass.com](http://agcglass.com), began installation of its new state-of-the-art magnetron sputtered vacuum deposition coater at its Greenland, Tennessee, manufacturing complex, which houses two float glass lines. AGC expects pro-

duction to begin in December. AGC's partnerships with the local labor union, Warren County and the state of Tennessee—which were an integral part of site selection—will create more than 200 new jobs and generate opportunities for additional expansion in the future.

### Viracon to Close St. George, Utah, Facility in March

Viracon Inc., [viracon.com](http://viracon.com), plans to cease operations at its St. George, Utah, facility in March. The plant is the smallest of the company's three U.S. manufacturing locations, and the closure will affect just under 200 of Viracon's 2,300 employees. Viracon will discuss relocation opportunities on a case-by-case basis, and work with the Utah Department of Workforce Services to assist its displaced work-force in finding new opportunities as it winds down operations in Utah over the next two to three months.

### Cardinal Glass Contract Carrier Welcomes New Glass Hauler

Smokey Point Distributing Inc., [spdtrucking.com](http://spdtrucking.com), a flatbed hauler and part of Daseke Inc., [daseke.com](http://daseke.com), welcomed Belmont Enterprises, [belmonttrucking.com](http://belmonttrucking.com), to its company. SPD is the contract carrier for Cardinal Glass Industries, [cardinalcorp.com](http://cardinalcorp.com). Belmont, headquartered in Olympia, Washington, is a dedicated glass hauler that will complement the existing glass hauling customers of SPD, say company officials.

### Global Private Equity Firm Riverside Invests in HMI Cardinal

Riverside Co., [riversidecompany.com](http://riversidecompany.com), a global private equity firm, invested in HMI Cardinal, [hmicardinal.com](http://hmicardinal.com). Cardinal operates a manufacturing facility in Louisville, Kentucky, seven distribution centers and nine delivery warehouses nationwide to meet the needs of roughly 5,000 customers across the U.S. and Canada. Riverside has completed more than 100 investments in the industry. The firm will invest to support additional growth at Cardinal.



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## News to Know

### Allegion Acquires TGP

Allegion PLC, [allegion.com](http://allegion.com), a global security products and solutions provider, acquired Technical Glass Products, [fireglass.com](http://fireglass.com), through one of its subsidiaries. TGP is expected to operate within the Americas region. Current TGP President Jeff Razwick will continue to lead the business. Read an interview with Razwick on page 18.

### Bohle Group Acquires Portals Luxury Hardware

Portals Luxury Hardware, [portalshardware.com](http://portalshardware.com), a shower and bath accessory manufacturer, joined the Bohle, [bohle-america.com](http://bohle-america.com), group of companies. Located in Kansas City, Missouri, and founded in 2001, Portals has a popular and extensive line of products for the shower and bath space, the company reports. The Portals location in Missouri will also become a distribution point for many Bohle America products.

### Quality Enclosures Adds Diamon- Fusion Coating to Shower Glass Line

Officials from Quality Enclosures, [qualityenclosures.com](http://qualityenclosures.com), announced the company began applying Diamon-Fusion International Inc.'s, [dfisolutions.com](http://dfisolutions.com), coating to its shower glass using FuseCube, a chemical vapor deposition process that fuses Diamon-Fusion to the glass surface. The company will begin with FuseCube at its manufacturing facility in Port Orange, Florida, with plans to expand business operations in part by adding two additional FuseCubes.

### LiteSentry and Stress Photonics Collaborate on Anisotropy Inspection Tech

LiteSentry, [litesentry.com](http://litesentry.com), partnered with Stress Photonics, [stressphotonics.com](http://stressphotonics.com), specialists in measuring stress and strain. The two companies will collaborate in the development, manufacture, sales and service of anisotropy inspection systems as an option to the Osprey Distortion and Flatness Inspection System, manufactured by LiteSentry.


### Filipino Glass Manufacturer Acquires AGC Flat Glass Philippines Inc.

TQMP Glass Manufacturing Corp., a Philippines-based glass manufacturer, finalized its acquisition of AGC Flat Glass Philippines Inc, [agc-flatglass.ph](http://agc-flatglass.ph). The facility is located in the city of Pasig on a 3-million-square-foot property and can produce 500 tons per day. AGC will continue to work with TQMP following the acquisition.

### Fuyao Glass America Creates Hardship Relief Fund for Employees

Fuyao Glass America Inc., [fuyaousa.com](http://fuyaousa.com), created the Fuyao Glass America Hardship Fund, a hardship relief fund to be administered through The Dayton Foundation. Eligible employees who have experienced financial setbacks due to illness or accident; a death in the family; the destruction of a personal residence; or medical expenses can apply for a grant through the fund. The Dayton Foundation will appoint a selection committee to approve grants, which range from \$500 to \$3,000.

### Building Envelope Company Integro Sees Growth

Integro Building Systems, [integrobuilt.com](http://integrobuilt.com), a building envelope company, reported that it has completed, or is constructing under contract, more than 1.5 million square feet of curtain wall in six U.S. and Canadian cities, and has achieved the milestone of approximately \$70 million in annualized sales revenue for 2017. Formed in spring 2015, the company is headquartered in Toronto with offices and operations throughout North America. 

*\*From Dec. 18, 2017, to press time, Jan. 24, 2018. To read these stories, and others, in their entirety, visit [GlassMagazine.com](http://GlassMagazine.com).*

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# NGA and GANA Finalize Combination

Association leaders share updated FAQs relevant to the merger

Officials from the National Glass Association, [glass.org](http://glass.org), and the Glass Association of North America, [glasswebsite.com](http://glasswebsite.com), announced the organizations officially combined on Feb. 1, becoming one, united voice representing the flat glass and glazing industry. Association leaders offered updated FAQs regarding the combination.

### Q: Is the NGA and GANA combination final?

**A:** Yes, both organization's memberships voted overwhelmingly to approve the combination. As of Feb. 1, 2018, NGA and GANA are now combined to form the largest trade association serving the architectural glass and metals industry supply chain, including glazing contractors, full-service glass companies, glass fabricators, primary glass manufacturers and suppliers to the industry.

### Q: Is there a new name for the combined association?

**A:** The newly combined association will be known as the National Glass Association; a name change will be considered within two years of the closing date. The GANA name will remain on technical documents and related materials during this period.

### Q: Will my membership change?

**A:** Yes, in that it will be stronger and more relevant, but members can expect the most vital aspects of both GANA and NGA will continue.

We need your continued support and involvement as we integrate, and both leaderships ask that companies renew their 2018 membership when notices are issued. A new combined dues structure will be put in place at the beginning of the 2019 membership year.

Please note that for GANA member companies to maintain their voice in the technical document development pro-



cess, their 2018 GANA dues invoice must be paid immediately if not yet paid.

### Q: What happens with GANA's staff?

**A:** GANA employed two full-time staff members, Urmilla Jokhu-Sowell and Sara Neiswanger. They have both been welcomed as full-time NGA employees.

The NGA formed a new Technical Services & Advocacy Department. Urmilla Jokhu-Sowell leads the department as advocacy and technical director, reporting to NGA president and CEO, Nicole Harris.

Sara Neiswanger joined the NGA as senior manager, GANA Member Services, reporting to NGA's membership and marketing director, Michele Nosko.

Code consultants, Tom Culp, Birch Point Consulting, and Thom Zaremba, Roetzel & Andress, will continue their work monitoring and representing the association and the industry's interests at building code hearings. Other consultants will be retained as needed.

### Q: What about the Annual Conference and the Fall Conference?

**A:** The Annual Conference will proceed as planned April 23-26 in Napa, California. Registration information can be found on [glasswebsite.com](http://glasswebsite.com). NGA members can attend the events at the member rate with a discount code provided in NGA's monthly newsletter.

Additionally, the Fall Conference will again be co-located with Glass-Build America in Las Vegas, held Sept. 12-14. Per attendee feedback, there will be minimal overlap between the Fall Conference and GlassBuild activities. The Fall Conference will begin on Monday, Sept. 11.

### Q: What happens with existing task groups and committees?

**A:** As mentioned above, the Integration Task Force will work to outline the new association's volunteer processes, and has recommended that the legacy GANA Division committees continue to operate as they have up through the Annual Conference in April, focusing on activities, deliverables and documents in process.

The association staff will also tap individual volunteers for micro-volunteering activity and projects, such as establishing course curriculum for education and training programs, writing questions for an industry trends survey or providing input on event programming.

Additionally, the Glazing Industry Code Committee and the Flat Glass Manufacturing Division will carry over to the new association, and NGA will provide management services for the Glazing Industry Secretariat Committee.

### Q: What's next?

**A:** A joint Integration Task Force of six representatives will oversee and advise the board of directors on transition and integration matters. NGA's representatives are: Michael Albert, president and owner, S. Albert Glass, [salbertglass.com](http://salbertglass.com); Angelo Rivera, vice president and general manager, Faour Glass Technologies, [faourglass.com](http://faourglass.com); Nicole Harris, NGA president and CEO. GANA's representatives are: Ren Bartoe, director, glass and industrial technologies, Vesuvius plc, [vesuvius.com](http://vesuvius.com); Julia Schimmelpenningh, global applications manager, Eastman



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Chemical Company, eastman.com; and Stanley Yee, building design specialist, Dow Corning Corp., dowcorning.com.

The task force will outline the new association's technical document development plan, refine the voting and approval process, and determine the advocacy process, among other tasks integral to the success of the combined association.

The ITF met for the first time on Jan. 24 and recommended that the legacy GANA Division committees continue to operate as they have up through the Annual Conference in April, focusing on activities, deliverables, and documents in process. Previously generated GANA documents will be maintained and offered. As of press time, the ITF was set to meet again in February and at the BEC Conference in March to continue its review of the technical process and structure. The end product of its work will come before the newly composed 13-member NGA board of directors as recommendations.

### Q: What is the new governance structure?

**A:** The new board of directors of the combined associations will consist of 13 voting board members:

- 3 glazing contractors
- 3 full-service glass companies
- 2 WDDA dealers
- 2 glass fabricators
- 1 primary glass manufacturer (company changes yearly or biennially)
- 2 glass industry suppliers
- the NGA President/CEO as a non-voting ex officio member.

Effective Feb. 1, two voting positions of the initial combined board of directors were filled by the current GANA president, Doug Schilling, president and CEO, Schilling Graphics, schillinggraphics.com, and current GANA immediate past president, Stanley Yee, by special designation in a resolution of the NGA board.


### Q: What are the benefits to combining?

**A:** There are many positive benefits resulting from the combination. First and foremost, NGA members will get to take advantage of GANA's wide array of member publications and technical services, while GANA members will have access to NGA's education and events. At the top of the list are positive impacts to association activities, including reducing operational and meeting redundancies. It will also trim time and expense for members and volunteers, so they can better focus on their companies' growth and objectives, and the long-term health and welfare of the glass and glazing industry. In addition, companies that have two memberships—one in NGA and one in GANA—will see a reduction in membership dues.

### Q: How were the combination decisions made?

**A:** The boards of directors of NGA and GANA appointed a Joint Task Force made up of members from both associations. NGA's representatives were: Michael Albert, Angelo Rivera, Nicole Harris and Jerry Jacobs, NGA general counsel. The GANA task force was represented by: Stanley Yee; Doug Schilling; Gus Trupiano, director of sales, AGC Glass North America, agcglass.com; Steve Marino, manager, technical support, Vitro Architectural Glass, vitroglazings.com; Kim Mann, GANA general counsel.

The Joint Task Force met several times over the course of eight months to work through what the combined association would look like, covering governance, bylaws and the final transaction document. In September 2017, the boards of directors of both NGA and GANA both unanimously approved combining our associations.

The NGA leadership will continue to update members and the industry as the integration evolves. For previous releases covering news of the combination, visit [glass.org/ngagana-releases.html](http://glass.org/ngagana-releases.html). 

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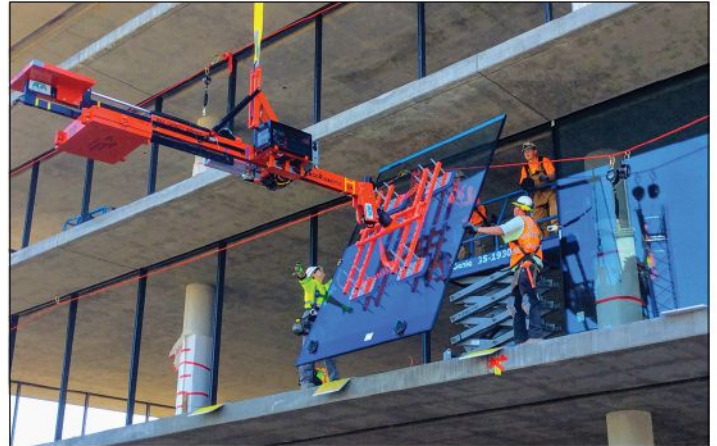
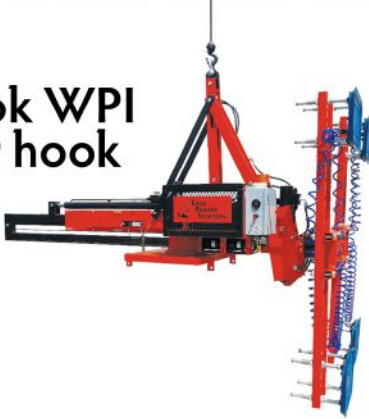




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## Manage Risks of Quality-related Data

Develop a plan to record, retain and evaluate information

By Matt Johnson

**D**ata regarding product and system quality, both in terms of quality assurance and quality control, increasingly finds its way into risk management and legal arenas. While the requirements and obligations surrounding quality checks in the glazing market vary by segment, quality data—data related to product and system quality—is an essen-

quality control tests the end result to make sure the system is reaching its intended goal. In other words, QA looks to the process and QC looks to the completed product, with both feeding information to each other.

The information that passes between QA and QC represents the fabrication chain of a design, system

have taken to contesting QA plans as insufficient to ensure delivery of specified building targets, for example, energy, water or sustainability. Challenges to the performance of a product or component are being based on the ability to identify specific QC manufacturing concerns with increasing precision. And, challenges to site assembly are often founded upon a gap in job-checks, at the QA and QC levels, that fail to document necessary performance points.

### How to collect quality data

The glazing marketplace must view quality as a big data issue that can be used to evaluate operations and defend claims. To do so, however, requires a process unto itself.

**1 Identify data to record** Start with considering the quality points that require recording. Each segment of the glazing market has its own unique quality considerations. Those standards and processes likely have points

### The glazing marketplace must view quality as a big data issue that can be used to evaluate operations and defend claims.

tial business tool and risk management device. Development of a plan to record, retain and evaluate that data can prove essential to quality fabrication.

Understanding the risk from quality data starts with recognizing the difference between well-worn terms like quality control and quality assurance. Quality assurance is a system to ensure correct actions and procedures, while

or assembly. Data collected along the development path can show how something is conceived, constructed and tested. It is also possible to identify insufficiencies, discrepancies and responses to quality concerns.

The ability to easily identify discrepancies and responses within broader sets of quality data is a tool that we see regularly. Parties challenging design concepts



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that can be identified and quantified as quality checks within a broader assurance plan. Evaluate those points and decide whether to record. Do not overdo; appropriate processes foster quality production without overburdening.

2

## Determine collection specifics and storage

Once the process points are identified, look to the type

of information that can be collected and consider its storage. Quality data as a risk management or production tool realizes its maximum use when there is easy and reliable access. Simplify the data recorded without sacrificing essential information. Use consistent terminology throughout quality data, regardless of the person inputting the information. Avoid “free text” entries. Consider whether

the process points can be recorded individually (“single cells”) to allow later discrete analysis. And ensure that the data entry and any changes are logged so that improper creation or modification is avoided.

3

## Review the data

Set up a review process for quality data. These regular, scheduled reviews

do not delve into what the data means, but simply look at the data itself. Examination of the data can show outliers—points that do not make sense within the broader process. They can also identify incomplete or inconsistent entries. Regular, small-batch reviews of quality data can help avoid later challenges to entire data sets.

4

## Use the data


Be ready to use the data. Develop the tools to respond to business or legal

inquires discretely. Mass volumes of QA/QC can overwhelm and eliminate the value in the development and effort surrounding a quality-data system. Without the ability to parse the data, the situation becomes one where quantity does not equal quality.

5

## Determine data deletion schedule

Consider retention. A quality-data plan should

evaluate when destruction of data is appropriate. Electronic data storage may ease the obligation of retention. Development of a regular schedule to summarize, evaluate and then destroy quality data—retaining the summary and evaluation—may suffice for certain operations. 



Matt Johnson is a member of The Gary Law Group, [prgarylaw.com](http://prgarylaw.com), a Portland-based firm specializing in legal and risk issues facing manufacturers of glazing products. Write him at [matt@prgarylaw.com](mailto:matt@prgarylaw.com).

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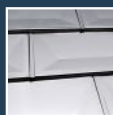
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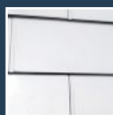
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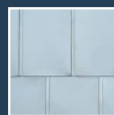
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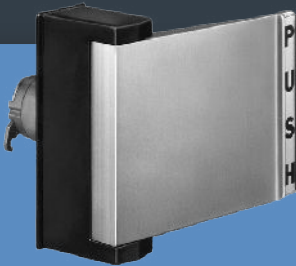
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# TGP's Jeff Razwick Talks of Growth and Change following Allegion Acquisition

**O**n Jan. 2, officials from Allegion Plc, [allegion.com](http://allegion.com), a leading global security products and solutions provider, announced the company had acquired fire-rated entrance and wall system supplier Technical Glass Products, [fireglass.com](http://fireglass.com), through one of its subsidiaries. Current TGP President Jeff Razwick, who will continue to lead the business, spoke with Glass Magazine about the deal.

## How did this acquisition come about? Was TGP looking to sell?

Selling was not our priority or focus. TGP and our space in the industry—this space of specialty fire-rated entrances and glass—has gone from very small niche to a much more popular solution for commercial and institutional buildings. Like any business, that growth, that popularity, brings opportunity and interest. It brings other players who are in that space.

## What drove Allegion's interest in TGP?

They are smart about how they are approaching, how they are better serving, their key market segments in the years ahead. We are seeing a trend away from component-based business to solution-based business. The Allegion team sees the direction of the industry toward a complete specified solution, particularly when it comes to things like fire- and life-safety solutions. They are looking to offer integrated, complex, tested complete specified solutions. They are bringing together lots of parts and pieces into a system. ... We've got to have a package solution for our customers. I think that speaks to what we've done and where we are headed.

## How will TGP benefit from being part of Allegion?

Our core business, every area of our business, every functional area of our company stands to benefit from this partnership with Allegion. They have hundreds of spec writers with complimentary products. The in-house R and D will be beneficial. We will have more robust executive support for IT, HR and manufacturing. Internally, this will be very helpful. It will take us to the next level.

## What changes can customers and employees expect at TGP?

The immediate future is business as usual. Whether it's our staff here, our partners, our customers, it will be business as usual.

In the long term, we expect more opportunities and better access to our products. ... Allegion, our team, [will work to] grow opportunities, grow the business. But that is a process. The goal here is to drive more specifications, drive more opportunities that benefit everyone. How do we better serve our distributors and fabricators with projects in the field? How do we better serve architects with expertise, complete solutions and hardware? How do we provide a better product? It isn't about a fire-rated door or window. It's about a well-engineered solution.

## You mentioned long term growth potential for TGP, as part of Allegion. Can you describe what future growth might look like?

We are going to be focused on expanding our current offerings and markets. From a market-based perspective, they are very strong in the areas where we are also strong—the




commercial and institutional markets. How do we grow that together? We are also looking geographically for other markets where our technology will meet the needs of the market.

## Will TGP continue its activities in its other product categories, such as steel curtain wall?

Yes, we will continue to grow and pursue the steel curtain wall business. Steel provides unique advantages to the marketplace—large free spans; blast, ballistic and security benefits. There is a lot of potential there.

## Allegion might be a new name to some in the glass and glazing industry. Can you tell me more about the company and its current product offerings?

Up until a few years ago, Allegion was Ingersoll-Rand. While you might not know Allegion by name, you would know Allegion's brands. The company includes leading hardware for commercial and institutional projects in our industry—Schlage, Von Duprin, LCN closers, Steelcraft doors and frames, Republic doors and frames. Allegion brands include leading steel door and frame, and fire-rated door and frames in the industry. All of our industry depends on Allegion products in our commercial and institutional projects. We all know and use their brands, and depend on their brands, every day. 



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# How to Finance the Purchase of a Glass Business

By Marco Terry

**F**inancing the purchase of a company is a complex procedure. This article offers an introduction to the purchase process for potential buyers interested in looking to expand their glass business by acquiring another company, or looking to get into the glass industry by buying an existing company. Note, any potential buyer should work directly with professionals to guide them through the process.

## Purchase structure

A small business can be purchased in two ways: by purchasing all outstanding stocks (or membership, if the business is an LLC), or by purchasing just the assets of a company without purchasing the corporate shell. Both methods have pros and cons.

Generally, purchasing the outstanding stock in a company gives the buyer all assets in addition to all current and potential future liabilities. This last point is important, as a buyer could be liable for future issues caused by actions that precede their ownership of the company. In the second method, the purchaser buys only the company's assets, such as copyrighted trade information, equipment, inventory, client lists, etc. The old corporate structure keeps the liabilities.

A purchaser's financing options may vary based on the choice of structure.

## Financing sources

Potential buyers should be aware of the various financing sources available. This section lists five sources of financing commonly used to purchase small and medium-sized companies.

1

### Seller financing

One of the most important sources of financing is provided by the seller.

2

### Small Business Administration-backed loan

Small Business Admin-

3

### Bank loan

An SBA 7(a)-backed loan is a great option for loans of \$5 million or less. For larger loans, buyers must use a conventional bank. Qualifying for a conven-



Seller financing is a loan that is amortized and paid over a period of time. The buyer often repays the loan using the proceeds of the business.

Seller financing is advantageous for two reasons. It is usually available at competitive rates that are negotiable and, more importantly, the loan ties the seller indirectly to the future performance of the business. It helps ensure that the seller was forthcoming regarding the potential performance of the company.

Keep in mind that the seller performs their due diligence on a buyer before providing financing. However, their due diligence is not as exhaustive as a bank's due diligence. Sellers are generally willing to finance 30 percent to 60 percent of the purchase price.

Administration-backed loans are another great source of financing. The SBA provides guarantees that enable banks to lend funds to entrepreneurs and small business owners who would not otherwise qualify for a loan. SBA loan amounts vary, but the 7(a) loans commonly used to buy businesses can provide up to \$5 million of financing.

While getting an SBA-backed loan is simpler than getting a conventional loan, the process still requires bank underwriting. The business being acquired must have enough cash flow to support the loan plus the cost of operating the company. Additionally, the buyers must have industry experience, some assets and reasonable credit.

tional bank loan is much harder than qualifying for an SBA-backed loan.

The company being purchased or merged with must have a good financial track record, solid assets and enough cash flow to repay the loan. Additionally, the buyers must have great credit and substantial assets of their own. Lastly, larger bank loans take time to approve because the underwriting team must review the business thoroughly.

4

#### **Inventory financing**

A buyer can cover some of the acquisition costs by leveraging some assets of the selling company (assuming the assets are free and clear). If the company has a lot of inventory, those assets can be leveraged using inventory financing. This strategy allows the buyer to use those funds towards the purchase cost of the business.

Keep in mind that finance compa-

nies never use market value when determining the value of the inventory to finance. Finance companies take this approach because, if they have to resort to foreclosing the collateral, they seldom can liquidate at market value. Instead, the finance company appraises inventory using the Net Orderly Liquidation Value or a similar metric. Depending on the details of the inventory, this appraisal method could shave a substantial part of its value. Furthermore, the finance company allows a buyer to borrow only a percentage of the appraised value.

5

#### **Personal funds**

Every transaction requires a buyer to make a contribution or down payment from their own funds. This part of the offer usually amounts to 20 percent of the purchase price, though lower percentages can be used if the purchaser has substantial seller

financing and they are buying an asset-rich company.

These personal funds usually come from savings or stock accounts. A purchaser can also leverage home equity or retirement. However, Commercial Capital LLC recommends against this path, as it is best to avoid risking a home or retirement in the event things go wrong.

Most offers use multiple sources of funding. A purchaser should always use seller financing if available. Since seller financing seldom covers the whole transaction, a purchaser will have to use personal funds or a loan to complete the purchase. ■



Marco Terry is managing director of Commercial Capital LLC, [comcapfactoring.com](http://comcapfactoring.com), a factoring company and leading provider of invoice financing to companies in the glass industry. He can be reached at 877/300-3258.

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## When Problems Arise

How to respond to mistakes or challenges and preserve a company's reputation

By Joe Erb

**W**hat happens when, despite a company's greatest efforts, an order or project doesn't go as planned? What actions does a company take when it has an unsatisfied customer, or when a miscommunication results in a hiccup with a partner?

The reality of business today is that glass industry companies must do more with less. Not only is the industry dealing with a labor shortage, but it is also at a tipping point with technology. Company investments in high-speed automated lines, integrated software and safety measures bring opportunities to have fewer touchpoints with product, overall higher quality and greater output. But they also bring with them

the risk of larger errors. Even though every good business has processes and procedures in place to maintain quality, efficiencies and, most importantly, safety, mistakes can happen.

In the event that they do, here are some actionable steps that will help a company get back on track when there is a bump in the road.

### 1

#### Be accountable.

Just like anything in life, owning the issue and acknowledging it with the customer (or vendor or colleague) is a necessary first step. The most important part of this step is to keep it as genuine as possible. A personal phone call—or better yet,

an in-person visit—is always better received than an email or note. It helps reinforce the importance of the relationship with that person or company, and it shows the situation is being taken seriously.

### 2

#### Create an action plan—for now and later.

Fostering an environment of corrective action means finding the root cause of an issue, executing a plan to fix it and then implementing long-term measures to ensure it doesn't happen again in the future. Again, communication is key here. When a customer knows when and how the problem is being resolved, the relationship is preserved, and trust is already starting to be rebuilt.

It's also important to keep this open dialogue with all vendors and partners. Although a company must take ownership with the customer, making sure

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every step of the process is examined and every party understands what can be done better in the future is critical. A company should establish a key point of contact with each vendor so that when something needs to be dis-

situation both internally and with the customer. When addressed the right way, getting through a particularly challenging time can deepen relationships and build credibility with customers.

### How a company responds to [challenges] can significantly affect its reputation and future success.

cussed, managers know with whom to speak. Keeping a consistent stream of positive, open communication in every facet of your business is an easy way to keep everything running smoothly.

3

#### Learn and move on.


Once the problem is resolved, and the processes and procedures are in place to ensure it isn't repeated, a company should move on from the

4

#### Always be safe.

No matter how urgent the issue or how quickly something needs to be addressed, safety should always be the number one priority. Through automation and other technologies, the industry has eliminated many different touchpoints—and, therefore, risks—when it comes to glass production. But there will always be associated risk factors when operating

machinery on the plant floor. Companies should put employee safety first, and invest in the education, procedures and appropriate measures to keep a safe working environment. That's a business pillar any customer can respect.

In this fast and furious industry, companies are bound to be faced with challenges. How a company responds to them can significantly affect its reputation and future success. If a company tackles each hurdle as it comes its way with an authentic, communicative and solutions-oriented mindset, success and happy customers will naturally follow. 



Joe Erb is commercial sales specialist for Quanex Building Products, [quanex.com](http://quanex.com). For more tips, read Quanex's blog, *In Focus*, at [Quanex.com/InFocus](http://Quanex.com/InFocus), or contact Erb at [joe.erb@quanex.com](mailto:joe.erb@quanex.com).

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# BUILDING

# A

## Seven tips for trade show success By Olivia Parker

PHOTOS BY ROBB COHEN PHOTOGRAPHY & VIDEO

# BOOTH

**T**rade shows offer a prime opportunity for companies to cultivate leads, interact with customers, build brand awareness, launch new products and gauge industry trends. To capitalize on trade show opportunities and to ensure trade show success, exhibitors should focus on developing a stand-out booth. “Your booth defines your show experience. It is the reason you’re there,” says Max Perilstein, owner of Sole Source Consultants, [solesourceconsultants.com](http://solesourceconsultants.com), a marketing and communications strategy consulting firm for the building products industry. “When exhibitors put little effort into their booth, they usually end up having a bad or unproductive time at the show. You just have to make attendees feel comfortable enough stepping onto that different-colored carpet, and it’s pretty simple from there.” Glass Magazine asked recent winners of GlassBuild America’s, [glassbuild-america.com](http://glassbuild-america.com), Best in Show exhibitor recognition program to offer tips on how to best design a booth and create a memorable experience for visitors. ►

01



### NARROW THE FOCUS

Several Best in Show winners recommend that exhibitors choose one product that will wow attendees and focus their booth design around that product. All pre-show promotions should highlight that one product.

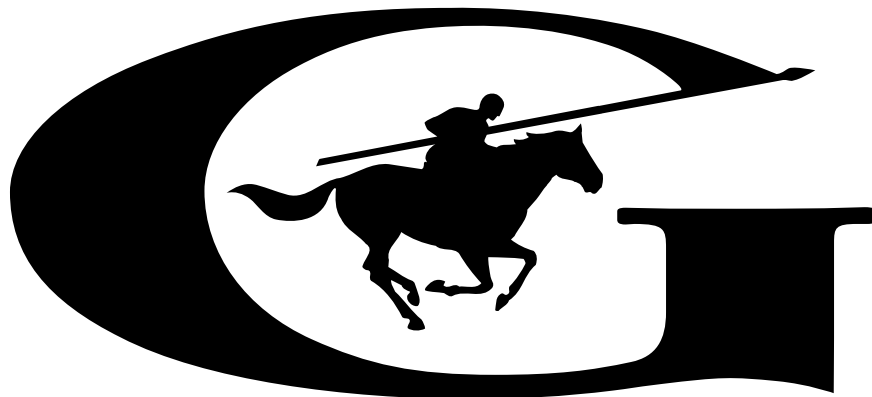
“We determine what core product/service we want to showcase and make it central to the booth experience,” says Jeff Jones, public relations manager

for Elias/Savion Advertising, representing Deceuninck North America, [deceuninckna.com](http://deceuninckna.com), the 2016 Large Booth Best in Show winner.

While booth design and promotion should emphasize a single product, a more comprehensive product line can be displayed inside the booth, exhibitors say.

“We focus on displaying one

thing, knowing we can share more once people approach the booth,” says Rina Chakour, vice president of marketing and business development, Phoenicia Flat Glass Industries, [Phoenicia-ltd.com](http://Phoenicia-ltd.com), winner of the 2017 Best in Show First Time Exhibitor award. “Put the best product in the front to create demand for other products.”



# JU MBO VISION

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## WORK WITH ORGANIZERS

A good booth starts with talking to the show's contractor and staff, Best in Show exhibitors say. Before arriving at the show, exhibitors should submit a booth layout to show organizers. The organizer will be able to work out any questions or concerns the exhibitor may have about booth layout, placement and size, or any accommodations that need to be made.

Prior to the event, show organizers can assist with questions big and small. Where should an exhibitor place their banner so that it can be seen from furthest away? How can a small booth exhibitor stand out against competitors with much larger booths? What is the most effective layout for a particular product? Contractors and staff know the ins and outs of the show, the floor and the convention center. They can provide valuable insights about the show that exhibitors and attendees may have never considered.

Once at the show, exhibitors should take advantage of onsite services available from the show contractor and organizer. This is particularly true when things don't go as planned, exhibitors say. For example, in 2017 several of the exhibitors at GlassBuild America reported they were delayed because of Hurricane Irma, and accommodations regarding their arrival and booth setup had to be made. "We had to adapt," says Chakour. "A few members of our staff weren't able to come at the last minute because of the hurricane. We had to let go, and let [the show organizers] help. For every challenge we faced we received help or found a solution."



▲ Deceuninck North America received the Best in Show award for Large Booth during 2016 GlassBuild America.



## RESEARCH THE SHOW

Prior to the event, exhibitors should familiarize themselves with the floor layout, the company's booth location, event schedule and more.

"I would recommend reading all the exhibitor information provided to you by the show. Make sure you have a booth layout made well in advance and submit it to the show management, so they can work with you," says Jessica Metz, marketing manager, Erdman Automation, erdman.com, the 2016 winner for Best Machinery Booth.

Some Best in Show exhibitors recommend starting this research a year in advance.

"If possible, walk the show the year before to get a feel for who is attending, layout

and companies you want to be near. Note what works in the booths and incorporate the ideas into your booth design. Look at the floor plan online, think about traffic flow for the show and which direction people will be seeing the booth from," says Deceuninck's Jones.

Once on the floor, exhibitors should be aware of the show's schedule. Foot traffic may be light because a certain event is happening, or a rush may be coming because lunch just ended, exhibitors say. The more familiar with the show's schedule an exhibitor can be, the easier it is to work within the flow of the event.

“

**I WOULD RECOMMEND READING ALL THE EXHIBITOR INFORMATION PROVIDED TO YOU BY THE SHOW. MAKE SURE YOU HAVE A BOOTH LAYOUT MADE WELL IN ADVANCE.**

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04



## DESIGN WITH INTENT

Booth design presents the opportunity for exhibitors to show who they are—to display their company and their products in a way that is tangible to potential customers. Exhibitors should determine the message they want to bring to customers and design the booth around best expressing that message.

The first priority of booth design should be brand recognition. Exhibitors should ensure branding is clear, concise and consistent. A booth visitor should immediately know which booth they are stepping into. “We look to create an inviting showplace that draws participants in while at the same time surrounding them with everything Lisec,” says Bob Quast, president, CEO and CFO, Lisec America Inc., [lisec.com](http://lisec.com), the 2017 winner for Best Machinery Booth.

The exhibitor should then consider product promotion. If a product is a company’s centerpiece for the show, it should be displayed in its best light, exhibitors say. “Guardian Glass believes the best way to view a product is in application,” says Andy Russo, director of marketing, Americas, Guardian Glass, [guardianglass.com](http://guardianglass.com). Guardian received the award for Best Large Booth in 2017. “Glass is a unique product to showcase. Reflection, scale, fabrication and, most importantly, lighting factor into the product experience.”

A shower stall can be set up to display a shower door, or machinery can be set up to do a demonstration.

05



## STAFF YOUR BOOTH WITH PURPOSE

A booth could look perfect, but it won’t matter if the employees staffing the booth aren’t positive and friendly, or are inattentive.

“Trade shows are more about building relationships than being a smooth salesman. Getting attendees to your booth is less about design and more about people. A person needs to catch your eye. Make small talk with potential customers, not about the product, but about life, how their show experience is going,” says Adam Conley, president and CEO, Glass Expanse, [glassexpanse.com](http://glassexpanse.com), winner of the Best Small Booth category in 2017.

Additionally, exhibitors should ensure there are always enough people in the booth to give attendees and potential customers the best service possible. “Traffic comes in phases, so even when the show seems to be emptying out around certain events, make sure you always have people in your booth. A few key leads may trickle in when it seems there’s no one around,” says SAF’s Faciane.

► Employees for Glass Expanse display their Best in Show award at 2017 GlassBuild America.



06



## CREATE CUSTOMER RELATIONSHIPS

When trying to create leads, exhibitors should strive for quality over quantity. Hundreds of people may pass through a booth, but if none become customers, then nothing of worth came of the exhibitor's efforts, exhibitors say. Quality drives profits, not quantity. "We'd rather leave the show with having only had 20 visitors, and 12 are solid leads, than have 200 hundred visitors who all mean nothing," says Faciane.

A booth should not only draw attendees in, but also keep them interested. Along with all the eye-catching products and branding, exhibitors should create a sit-down area with things

like coffee machines and phone-charging stations to give attendees a place to rest their feet and learn about the exhibitor while they're there.

"The goal for the Guardian Glass team at every trade show is, first and foremost, to enable conversations in the booth that bring value to our customers and visitors new to Guardian Glass," says Russo. "We design with various visitors in mind. From decades-long relationships to brand-new connections, we work to create a welcoming and informative space.



▲ Guardian Glass offered on-the-spot expert consultations at its Glass Solutions Hub during 2017 GlassBuild America.



**Online:** Visit [GlassMagazine.com/March2018](http://GlassMagazine.com/March2018) for a complete list of recent GlassBuild America Best in Show winners.

## GEAR UP FOR GLASSBUILD

2018 promises to be another exciting year for the glass and glazing industry, and this year's GlassBuild America: The Glass, Window & Door Expo, set for Las Vegas, Sept. 12-14, will enhance the exhibitor and attendee experience to capitalize on industry success. GlassBuild America show organizers offer opportunities to promote exhibiting companies and products in advance of the show. Visit [GlassBuildAmerica.com](http://GlassBuildAmerica.com) or [GlassMagazine.com/March2018](http://GlassMagazine.com/March2018) to find out how.

Additionally, to support a successful show for everyone, show organizers provide:

- **Display Guidelines**, which are detailed in the GlassBuild America Booth Application.
- **Exhibitor Show Rules and Regulations**, specific to the trade


show facility and detailed for each exhibitor.

- **First-time Exhibitor Guide**, which offers a specialized summary of general trade show information and specific GlassBuild America information.
- **Machinery Supplement**, which targets valuable information for exhibitors displaying machinery and equipment.
- **New for 2018:** Improved Exhibitor Console and enhanced promotional tools.
- **New for 2018:** Additional exhibit hours on the first day for a welcome event on the trade show floor.

Find this information and more, including how to register as an exhibitor or attendee, at [GlassBuildAmerica.com](http://GlassBuildAmerica.com).

## FOLLOW UP

After the show, exhibitors should make sure to follow-up with leads. Without prompt follow up, exhibitors will probably lose the interest of potential customers after the excitement of the show has come and gone.

"An essential component of the plan, but one that is easy to neglect because it's not part of the at-the-show experience, is follow-up with booth visitors. This is the reason you're at the show," says Russo "Don't lose the momentum by waiting too long, or worse, not communicating at all, with your customers." 

07





**TOP GLASS FABRICATORS**

# UP TO THE CHALLENGE

*FABRICATORS REPORT SALES GAINS  
IN FACE OF INCREASED COMPLEXITY, LABOR STRUGGLES AND  
SUPPLY CONCERNS*

BY NORAH DICK AND KATY DEVLIN;  
CONTRIBUTIONS FROM WENDY VARDAMAN

*ONLINE:*

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**2017** WAS A YEAR OF STRONG GROWTH FOR MOST U.S. AND CANADIAN GLASS FABRICATORS, ACCORDING TO GLASS MAGAZINE'S ANNUAL TOP GLASS FABRICATORS REPORT. EIGHTY-ONE PERCENT OF FIRMS ADDED PRODUCTION CAPACITY DURING THE YEAR, AND 71 PERCENT REPORTED YEAR-OVER-YEAR SALES GROWTH, ACCORDING TO THE REPORT. NEARLY ALL TOP GLASS FABRICATORS—91 PERCENT—REPORT CAPITAL ACQUISITION PLANS, AND 86 PERCENT HAVE PLANS FOR FUTURE EXPANSIONS.

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Fabricators say strong market demand has kept companies busy and sales high. However, it has also stretched capacity and exacerbated an already tight labor market. Sixty-seven percent of Top Glass Fabricators said the labor shortage worsened between 2016 and 2017, and a plurality of survey respondents ranked it as the top challenge for the year.

The biggest challenge for Kensington Glass Arts, [kensingtonglass.com](http://kensingtonglass.com), was “maintaining our production capability in a fast-paced production demand world [despite] the tight labor supply,” says Bill Wilson, director of sales, Kensington Glass Arts, [kensingtonglass.com](http://kensingtonglass.com).

Concerns over glass supply also continued during the year, particularly after several U.S. float lines went down unexpectedly midyear. “Glass supply became a challenge in 2017,” says Richard Wilson, president, AGNORA, [agnora.com](http://agnora.com). “Working with our suppliers to inventory additional glass allowed AGNORA to meet customers’ demands.”

“Glass supply has continued to be a challenge for Vitrum,” agrees Michael Zizek, marketing director, Vitrum, [vitrum.ca](http://vitrum.ca). “As a leader in our region, we can easily consume more glass than is available by our certified fabricator partners in North America. Throughout 2017 many projects were delayed due to lack of glass supply.”

In addition to keeping up with higher demand, fabricators say they also face calls for more advanced glasses and

more challenging orders. Architects and building owners want larger lites, which requires fabrication equipment to accommodate jumbo sizes. Calls for more decorative products require new or updated machinery. Quality demands have increased, particularly with the proliferation of all-glass systems that feature bare, polished edges. “[We’ve seen] increased expectations regarding quality, especially for laminated railings,” says Gary McQueen, senior director of sales and marketing, J.E. Berkowitz, [jeberkowitz.com](http://jeberkowitz.com).

Orders have also become more complex, with projects featuring multiple glass types in sophisticated systems, fabricators say. “Architects are wanting to push glass to its limits,” says Patrisia Yanez, product development leader, decorative products, Cristacurva, [cristacurva.com](http://cristacurva.com). “We are combining various products into one. For example, [we are] taking custom decorative glass and fabricating it as large as possible—oversized—and at a special radius—curved—for an application that requires energy-efficient glass, all in one.”

#### **Report and map**

Learn more about the state of the glass fabrication market in the Top Glass Fabricators report that follows—from an in-depth look at trends and industry performance in The Market on pages 34-37, to the list of Top Glass Fabricators on pages 46-54, to a series of project features that demonstrate the move toward more complex and value-added

glass applications on the interior and exterior, on pages 38-45.

This year’s Top Glass Fabricator report also includes a pull-out map featuring all locations in the United States and Canada. For an interactive, searchable map of the 236 Top Glass Fabricator locations, including additional details about each plant, visit the revamped and updated website [WorldofGlassMap.com](http://WorldofGlassMap.com).

#### **About the list**

The Top Glass Fabricators annual list is based on annual sales volume and recognizes glass fabrication companies that operate stand-alone architectural glass fabrication plants in the United States or Canada. An exception to this rule is Tecnoglass. Although the Tecnoglass’ manufacturing facility is located in Barranquilla, Colombia, its significant U.S. presence earned it a spot on the list. The list does not include float glass manufacturers that also have fabrication capabilities at their locations.

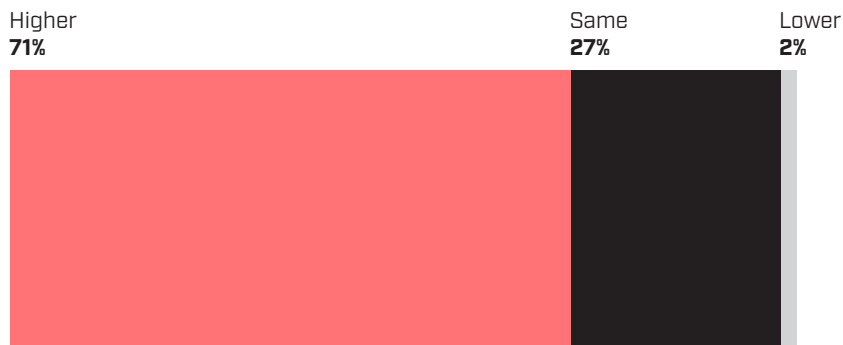
The majority of the information included in the Top Glass Fabricators report comes directly from the fabricators themselves. In cases where a company did not provide information, Glass Magazine gathered sales estimates and other data from industry insiders, business credit resources, prior year submissions and the respective companies’ websites. Sales figures for these companies are shown as estimates. Although the report provides specific sales data when it’s available, many privately held companies do not release sales figures. As a result, fabricators are listed alphabetically within six sales range categories.

We at Glass Magazine believe the Top Glass Fabricators report reflects leading companies within this industry segment. If your company belongs on the list, or you would like to update the information published here, please contact us. It is only with the cooperation of individual companies that Glass Magazine’s Top Glass Fabricators can reflect the industry as it is today. Questions or comments about this year’s list and requests to be included next year can be sent to Norah Dick at [ndick@glass.org](mailto:ndick@glass.org).

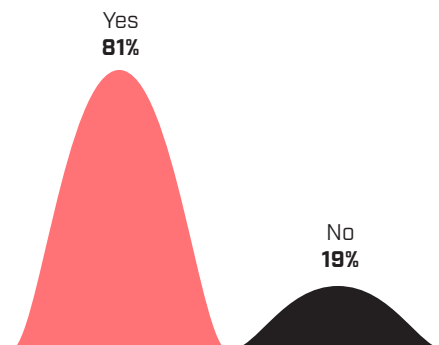


# THE MARKET

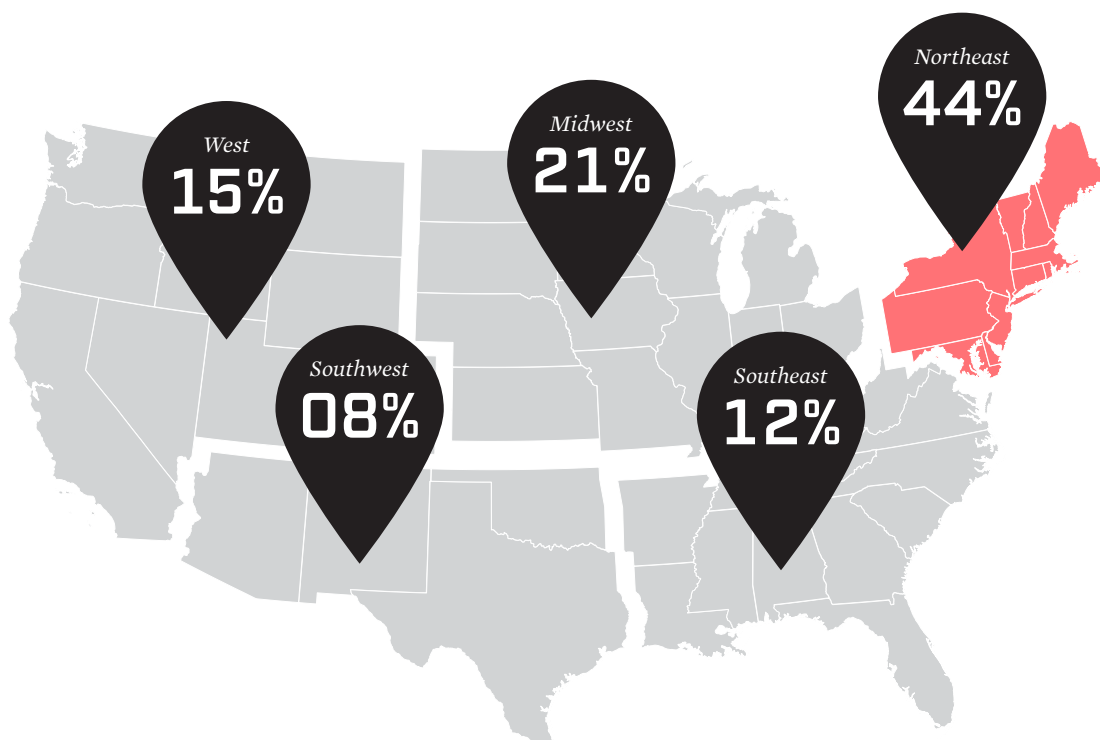
## 1. HOW DID SALES LEVELS IN 2017 COMPARE TO THE PREVIOUS YEAR?



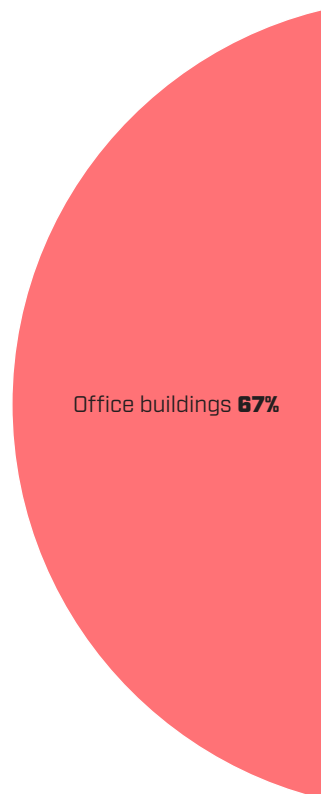
## 2. DID YOUR COMPANY ADD PRODUCTION CAPACITY IN 2017?



## 4. WHICH GEOGRAPHIC MARKET OFFERS THE MOST POTENTIAL FOR GROWTH IN 2018?



## 5. WHICH OF THE FOLLOWING GROWTH FOR YOUR COMPANY



## FABRICATORS MEET INCREASED DEMAND WITH EXPANSION AND INVESTMENT

### 3. WHAT PRODUCT OFFERS THE MOST POTENTIAL FOR GROWTH IN 2018?

Energy-efficient glass **40.3%**

Decorative glass **19.2%**

Other\* **19.2%**

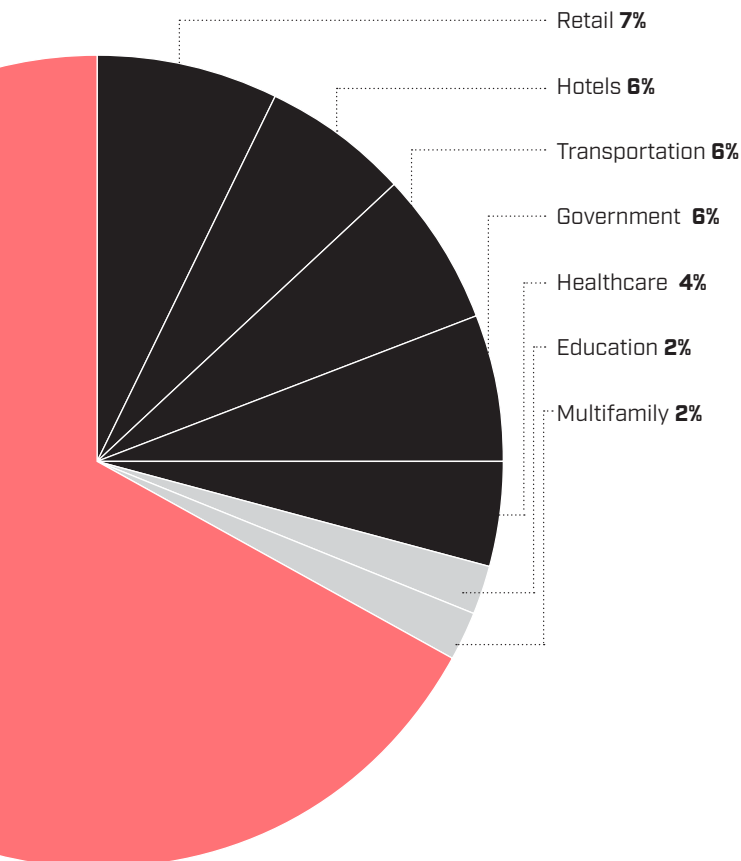
Protective glazing **17.3%**

Dynamic glazing **2%**

Solar **2%**

*\*Including oversized/jumbo glass, office partitions and railings, laminate fabrication, digital printing, custom glass and metal products.*

### COMMERCIAL CONSTRUCTION SEGMENTS PROVIDED THE MOST IN 2017?



**1.** A large majority—71 percent—of Top Glass Fabricators reported an increase in sales in 2017. However, this marks a decline from 2016, when 89 percent of companies reported a growth in sales.

**2.** Most Top Glass Fabricators increased production capacity in 2017. The reason for many companies is the growing market demand for more specialty glass products, from decorative products to oversized glass.

“We continue to see growing demand for decorative glass, as well as a need for design assistance. We are working with our customers to provide the information and design assistance that they need to successfully integrate decorative glass into their business and take advantage of this trend,” says Josh Primmer, sales, M3 Glass Technologies, m3glass.com.

Companies also report adding capacity in order to improve lead times, increase production efficiencies and better serve the busy construction economy.

**3.** Top Glass Fabricators were asked to choose the one product area that offered the most opportunity for growth. Despite strong market potential for specialty glass products, many fabricators still eye energy-efficient, high-performance glass products as the top target market.

“In addition to an increased

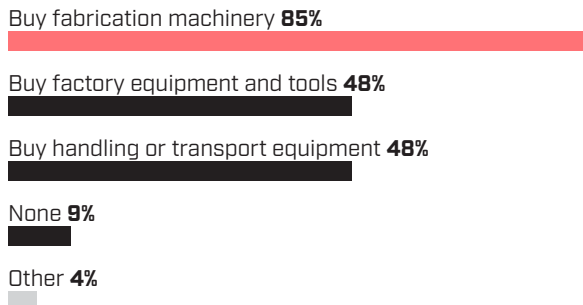
demand for larger sizes, the industry is moving towards more energy-efficient products ... The interest in environmentally-conscious products in general is on the rise, and we are seeing more requests for energy-efficient [insulating glass units], bird-friendly glass and similar products,” says Tad Diemer, marketing specialist, Glasswerks LA Inc., glasswerks.com.

**4.** Companies were asked to choose one geographical region poised for growth. The Northeast came away on top, with 44 percent of the vote, followed by the Midwest at 21 percent.

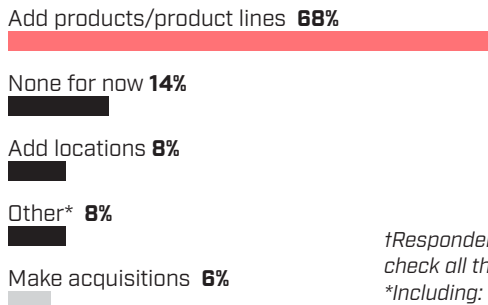
**5.** Top Glass Fabricators were asked to choose the one building segment area that offered the most growth in 2017. According to the survey, office building construction was by far the strongest segment for companies.



#### WHAT ARE YOUR FUTURE CAPITAL ACQUISITION PLANS?†

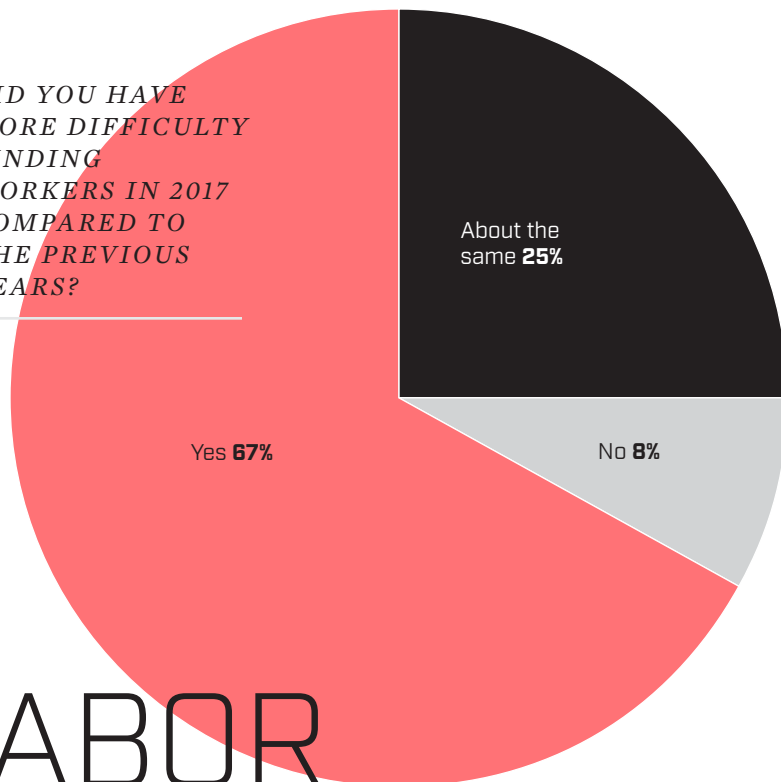


#### WHAT ARE YOUR COMPANY'S FUTURE EXPANSION PLANS?†



†Respondents were asked to check all that apply.  
\*Including: Consolidate support to customers, make additions to factories, increase capacity.

DID YOU HAVE MORE DIFFICULTY FINDING WORKERS IN 2017 COMPARED TO THE PREVIOUS YEARS?



# LABOR CHALLENGES CONTINUE

Fabricators continue to rank the labor shortage as the biggest challenge facing the industry, ahead of glass supply and capacity planning. Sixty-seven percent of survey respondents say finding labor was more difficult in 2017 than the previous year. A number of companies report they are leaning more heavily on automated machinery. Others say they are pursuing a wide range of methods for recruitment and retention, including:

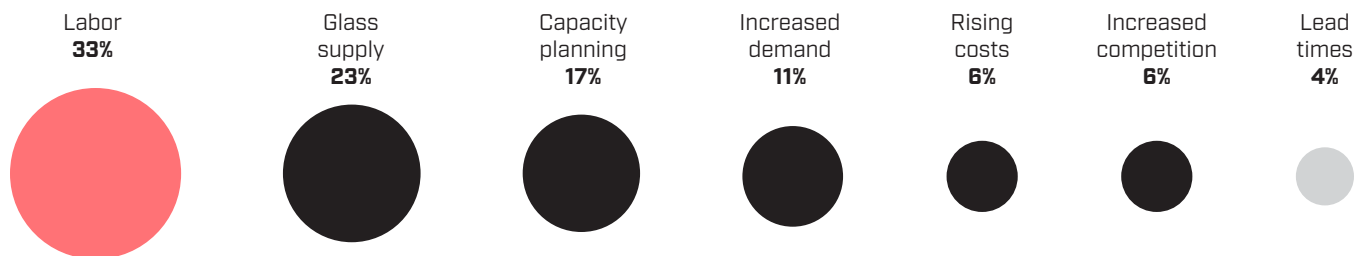
- Social media advertising
- Incentivized employee referral programs
- Competitive wages and benefits
- Improved onboarding and training programs
- Internship programs
- High school graduate recruitment
- Outside recruiters.

"We have started to leverage social media more, such as Facebook, LinkedIn and Glassdoor to further enhance our presence," says Jordan Filenko, marketing and communications, Garibaldi Glass Industries Inc., garibaldiglass.com.

"We ... encourage our team to invite skilled craftsmen they may know to join us as they understand our quality needs and market demands," adds Patrisia Yanez, product development leader, decorative products, Cristacurva, cristacurva.com.

Richard Wilson, president, AGNORA, agnora.com, says his company focuses on training. "We hire for fit first and train our employees for skill," he says. "Our full in-house training program allows us

## WHAT WAS YOUR COMPANY'S BIGGEST CHALLENGE IN 2017?



to promote from within, which ensures a more harmonious working relationship with a strong workplace culture and low turnover.”

#### Viracon Announces Closure of Utah Plant

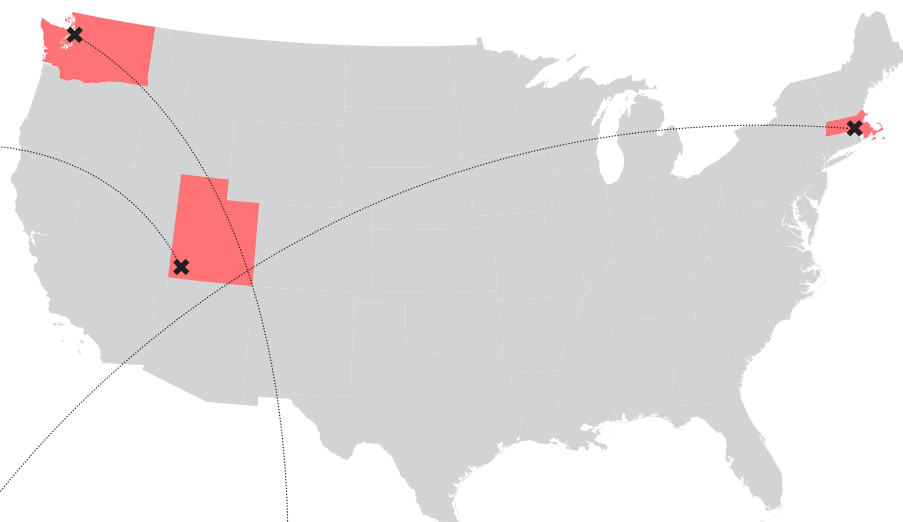
Viracon Inc., [Viracon.com](http://Viracon.com), announced plans to cease operations at its St. George, Utah, facility in March. The plant is the smallest of the company's three U.S. manufacturing locations. The closure follows several years of productivity improvement and new equipment and infrastructure investment at its Owatonna, Minnesota, and Statesboro, Georgia, facilities.

#### Saand Acquires Guardian Massachusetts Fabrication Facility

Saand Inc. acquired the Guardian Webster Inc. fabrication facility located in Webster, Massachusetts. In business since 1973, Saand is headquartered in Toronto, Ontario, and currently operates four glass fabrication facilities in the province of Ontario. The addition of the Webster facility, with its fabrication and insulating glass unit production capabilities, will enable the company to improve service and responsiveness to the Northeast U.S. market, according to the company.

#### Hartung Glass Industries Opens Dedicated Commercial IG Facility in Washington

Hartung Glass Industries opened a new, dedicated commercial insulating glass

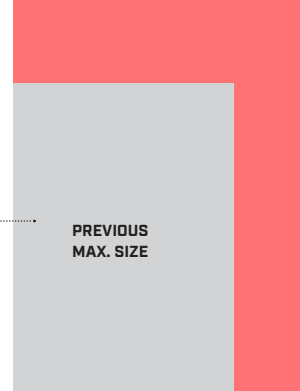


fabrication plant in Tukwila, Washington, in February 2017. The new facility includes inline inventory, cutting, tempering, insulating, crating and shipping specifically designed for large and oversized insulating glass units.

#### Bigger glass, bigger machines

To meet demands for larger glass sizes, a number of fabricators announced the installation of equipment capable of processing larger sizes. Glasswerks, [glasswerks.com](http://glasswerks.com), announced its jumbo glass facility in southern California that is capable of producing annealed, tempered, laminated, and even bent glass products. The company offers products in sizes up to 130 by 300 inches. Glennys Glass Co., [glennygls.com](http://glennygls.com), installed a tempering furnace and insulating glass

#### NEW BIG GLASS CAPABILITIES



line capable of producing 106-by-142-inch units. Glassfab Tempering Services, [GlassfabUSA.com](http://GlassfabUSA.com), upgraded its tempering furnace to 130 by 315 inches. Vitrum, [vitrum.ca](http://vitrum.ca), announced digital printing in sizes up to 110 by 200 inches.

# THE PROJECTS



© Terry Wieckert, Abstract Photography



# VIRA



## COMPANIES TOUT THEIR COMPLEX FEATS OF FABRICATION



Viracon's Dip-Tech, [dip-tech.com](http://dip-tech.com), digital glass printer.

# IRACON

BROOKLYN  
HEALTH CENTER

An arresting curved façade of decorative glass surrounds the new state-of-the-art Brooklyn Health Center in Brooklyn, New York. To achieve the unique and vibrant wave pattern on the exterior of the building, Viracon, [viracon.com](http://viracon.com), provided 50,157 square feet of insulating glass, including over 22,000 square feet of DigitalDistinctions digitally printed glass.

DigitalDistinctions, a specialty line of glass engineered to combine energy performance and ceramic printing, was part of a design that integrates vertical and horizontal glass framing lines and vertical fins, along with waves of horizontal digitally printed lines and various shaped lites, says Annette Panning, director, marketing and product management, Viracon.

Creating the complex effect required close collaboration between architect Francis Cauffman, [franciscauffman.com](http://franciscauffman.com), and Viracon, especially regarding color selection. Whereas most designers are familiar with CMYK litho-printing, they may be less familiar with ceramic digital inks, explains Panning. Viracon fabricated 12-inch-by-12-inch samples during the design process for the architect's review and feedback regarding color and pattern, she says.

Aligning the horizontal and vertical framing lines across 158 differently shaped lites presented a definite challenge for the fabrication team. To ensure consistent color-printing across all lites, Viracon printed a mockup using simulated etch ink, a process that in itself posed difficulties.

"Printing simulated etch ink requires an ultra-clean work environment, as the transparent etch ink magnifies imperfections caused by dust or oils left on the glass prior to printing and firing," says Brian Distel, Viracon's digital print specialist. "By using the glazier's elevation, we were able to position each prepped file in its location on the curtain wall, prior to printing, to check for inconsistencies in the hookup/registration of the line pattern. By catching any issues prior to printing, we saved everyone involved time and money."

To align lites correctly during the printing process, Viracon's prepress department created unique identifiers for each of the 3,000 lites of glass. The team created a digital file for each lite that contained information for the color(s) to be applied, the size of the lite and whether or not edge deletion should occur, if the unit was coated, explains Distel. Operators then used the individualized specs to physically place the lite so that the printer could register it, a process that was key for the differently-shaped lites.

"With odd-shaped lites, the orientation is critical," says Distel. "There was typically only one corner that could be used for proper registration." Inks were printed directly onto the glass substrate and then Viracon's VRE-59 coating was applied over the printed image.

Skansa, [skanska.com](http://skanska.com), was the general contractor. EFCO Corp. manufactured the curtain wall, and handled the full assembly of the unitized system and the installation.



*Photos by The Cygnus Design Group and AGNDRA*

AG



# AGNORA



## CADILLAC FAIRVIEW SHOPS AT DON MILLS

S

triking decorative glass pylons guide visitors through the Cadillac Fairview Shops at Don Mills, an outdoor mall in Toronto.

AGNORA, [agnora.com](http://agnora.com), fabricated the glass signage, including: five 40-foot pylons to mark the main entrance; three 32-foot pylons at the secondary entrance; and 27 smaller signs, each just under 10 feet, for parking spaces and intersections.

Given the wayfinding purpose of the outdoor signs, the design required pylons and signage to be visible both day and night. Creating the desired effect required that AGNORA closely collaborate with the design team, and experiment with ink opacity and color application, says Richard Wilson, president of AGNORA.

“In a collaborative process with the sign designer, Jonathan Picklyk of [the Cygnus Design Group] and the sign installer, Forward Signs Inc., AGNORA developed a two-layer opacity application of the ink, meaning a double pass on the same surface to achieve the desired color and preserve the design intent,” explains Wilson. “This created a stunning effect both during daylight and when backlit at night.”

The use of frit for the signature pieces also represented a design hurdle. “Using frit for a project needing visual integrity both day and night on both sides posed technical challenges,” says Wilson. “Internal samples and progressive mock-ups for the project players to test allowed the process to move forward.”

AGNORA fabricated the gateway pylons by digitally printing ceramic frit onto about 6 1/2-by-19 1/2-foot panels of Pilkington’s Optiwhite, low-iron, monolithic and two-ply laminated tempered glass. Each gateway pylon was then constructed by stacking two of the panels vertically, with the graphic pattern designed to transition between the pieces.

The general contractor was Ellis Don, [ellisdon.com](http://ellisdon.com). Signs were installed by Explore1, [explore1.ca](http://explore1.ca). Installation was managed by Forward Signs Inc., [forwardsigns.com](http://forwardsigns.com). The designer was The Cygnus Design Group, [cygnusgroup.ca](http://cygnusgroup.ca).



**D**ynamic orange and white fins decorate the lower levels of Amazon's new campus in downtown Seattle. Vitrum Glass Group, [vitrum.ca](http://vitrum.ca), delivered a total of 1,000 glass fins for the project, covering about 10,000 square feet on the exterior of the building.

"The fins not only add color and dimensional relief, but also help control the amount of direct sunlight on the building skin," says Dale Alberda, principal and architect, NBBJ, [nbbj.com](http://nbbj.com), the design firm on this project. "The idea to use two colors came very early in the design process and was driven by the desire to create a dynamic and changing building façade."

Each of the glass fins is composed of two 1/4-inch, low-iron, heat-strengthened Starphire Velour Etch glass panes on the external surfaces. The laminate interlayer is comprised of 0.030 clear polyvinyl butyral, 0.030 Trosifol Diamond White PVB and a GCC ceramic frit. The ceramic frit was roll-coated onto the glass in colors "Curry," "Forceful Orange," "Nasturtium" and "Golden Rod." Vitrum created four sizes for the panels, ranging from 8-by-63 inches to 12-by-87 inches.

The desired color effect required some initial trouble-shooting with the design and glazing team, says Michael Zizek, marketing director, Vitrum Glass Group. The design brief included

two-toned, double-sided glass fins in three shades of orange and three shades of white, with the orange transitioning from darkest to lightest. To achieve this look, the glazing contractor, Walters and Wolf, [waltersandwolf.com](http://waltersandwolf.com), approached Vitrum to create a laminated make-up that combined the two colors, with a matte finish on the orange-colored side, says Zizek.

Creating the orange-white, two-tone fin proved a slight challenge, he explains, and required Vitrum to produce several samples. "We had a number of challenges with read through, where the orange continued to be visible or was impacting the purity of the white," says Zizek. To overcome the issue, the fabricators replaced the white ceramic frit and one of the clear PVB interlayers in their original sample with Diamond White PVB. "This produced the most rich and vibrant oranges and prevented all read through, with no orange being visible from the white side of the fin," says Zizek.

Walker Glass, [walkerglass.com](http://walkerglass.com), fabricated the Velour Etch Starphire glass. Vitro Architectural Glass, [vitroglazings.com](http://vitroglazings.com), was the glass manufacturer. Kuraray Co., [kuraray.us.com](http://kuraray.us.com), and Trosifol, [trosifol.com](http://trosifol.com), supplied the Diamond White PVB interlayer. Sellen Construction, [sellen.com](http://sellen.com), served as the general contractor. Glass Coatings & Concepts LLC, [gcconcepts.com](http://gcconcepts.com), provided the ceramic frit.

*Photos by Vitrum Glass Group*

## AMAZON CAMPUS

# VITRUM









# SKYLINE DES

## THE MUSEUM OF THE BIBLE



**T**he Museum of the Bible in Washington, D.C., features 381 large custom glass panels digitally printed with images of biblical artifacts. Skyline Design, [skydesign.com](http://skydesign.com), fabricated the decorative glass panels for the 30,000-square-foot museum, which opened in November 2017.

“The unique character of enlarging

and reproducing archival documents on the surface of glass set this project apart,” says Mark Toth, sales director, Skyline Design. “The importance of reproducing original documents to be shared by the public in a museum of this magnitude was unique.”

Achieving the design goal of replicating biblical artifacts on architectural glass required close collaboration between Skyline Design and the

project’s interior architects, PRD Group, [theprdgroup.com](http://theprdgroup.com), says Toth. As a team, PRD and Skyline worked to realize the architect’s concept. “PRD created the artwork and our production team worked closely with them to turn their conceptual layouts into reality,” he says. Design and Production Inc., [d-and-p.com](http://d-and-p.com), installed the glass and provided fabrication for other parts of the exhibit.



# SIGN



Photo by Maxine Schnitzer Photography

Color matching proved to be one of the main challenges of reproducing printed text on glass, says Toth. The architect and fabricator worked back and forth with hundreds of samples to match the correct color, hue and saturation. “Color and character of the ancient documents had to be interpreted through the digital printing process and visually matched the thickness of the glass,” he says. “Much of the glass

was back-lit, so Skyline Design had to work closely with the lighting designer to achieve the desired result.”

The glass was 1/2-inch low-iron from Vitro Architectural Glass, [vitroglazings.com](http://vitroglazings.com). Skyline tempered the glass in-house, and digitally printed on side No. 2. For a little less than a quarter of the panels, Skyline also deeply etched the text on side No. 1 and then painted the etched glass

with a gold infill. After digital printing, glass panels were tagged, packed and crated for final installation on-site. Once samples and full-scale glass mockups were approved, Skyline cut the glass to spec. Panel sizes ranged from 12-by-20 inches to 58-by-80 inches.

## THE LIST

TOP GLASS FABRICATORS BASED  
ON ANNUAL SALES VOLUME

Companies are listed in alphabetical order within sales categories.

## \$250 to \$500 million

**Viracon**Owatonna, Minn.  
viracon.com**Employees:** 2,200**Certifications:** IGCC**No. of locations:** Two**Products offered:** Insulating, tempered, laminated and decorative glass.Kuraray/SentryGlas, NSG/  
Pilkington Select Fabricator,  
Saint-Gobain**No. of locations:** Three**Products offered:** Tempered,  
insulating, laminated and decorative glass.**Saand Inc.**Toronto  
saand.ca**Employees:** 520**Certifications:** AGC, IGCC,  
SGCC, Guardian Select Fabricator,  
Kuraray/SentryGlas,  
NSG/Pilkington Select Fabricator,  
Vitra/PPG Certified Fabricator**No. of locations:** Five**Products offered:** Tempered,  
insulating, laminated and decorative glass; heat-soaked glass, mirror.

## \$100 to \$250 million

**Hartung Glass Industries**Tukwila, Wash.  
hartung-glass.com**Employees:** 800+**Certifications:** Vitro/PPG  
Certified Fabricator, Guardian Select  
Fabricator, Kuraray/  
SentryGlas**No. of locations:** Nine**Products offered:** Tempered,  
insulating, laminated and decorative glass; switchable  
privacy glass; magnetic glass  
whiteboards.*Hartung is the parent company  
of Agalite Shower & Bath Enclosures,  
agalite.com; Holcam Bath & Shower  
Enclosures, holcam.com; and Lami Glass  
Products, lamiglass.ca.***Prelco Inc.\***Rivière-du-Loup, Québec,  
Canada  
prelco.ca**Employees:** 600**Certifications:** IGCC, SGCC,  
Guardian Select Fabricator,

## \$50 to \$100 million

**Cristacurva**Houston  
cristacurva.com**Employees:** 600**Certifications:** AGC, IGCC,  
SGCC, Vitro/PPG Certified  
Fabricator, Guardian Select  
Fabricator, Kuraray/Sentry-  
Glas, NSG/Pilkington, Saint-  
Gobain**No. of locations:** Three**Products offered:** Tempered,  
insulating, laminated and decorative glass; curved glass;  
oversized glass; integrated  
blinds; solar control glass.**Gardner Glass Products Inc.**North Wilkesboro, N.C.  
gardnerglass.com**Employees:** 230**No. of locations:** Three**Products offered:** Laminated  
and decorative glass; acid  
etched mirror, acid etched  
glass, copper-free mirror.**GGI**Secaucus, N.J.  
generalglass.com**Employees:** 203**Certifications:** NSG/Pilkington,  
Vitra/PPG Certified Fabricator**No. of locations:** Three**Products offered:** Tempered  
and decorative glass.**Glassfab Tempering Services Inc.**Tracy, Calif.  
GlassfabUSA.com**Employees:** 200**Certifications:** IGCC, SGCC,  
Guardian Select Fabricator,  
Kuraray/SentryGlas, NSG/Pilkington,  
Vitra Certified Fabricator**No. of locations:** Three**Products offered:** Tempered,  
insulating, laminated and decorative glass; fire-rated glass; mirror.**Glasswerks LA Inc.**South Gate, Calif.  
glasswerks.com**Employees:** 500**Certifications:** Guardian Select  
Fabricator, Vitro/PPG Certified  
Fabricator**No. of locations:** Four**Products offered:** Tempered,  
insulating, laminated and decorative glass; jumbo glass,  
bent-tempered glass, warm-  
edge insulating glass units,  
mirror.**Tristar Glass Inc.**Catoosa, Okla.  
tristarglass.com**Employees:** 235**Certifications:** AGC, IGCC,  
SGCC, Guardian Select Fabricator,  
NSG/Pilkington, Kuraray/  
SentryGlas, Saint-Gobain,  
Vitra/PPG Certified Fabricator**No. of locations:** Four**Products offered:** Tempered,  
insulating, laminated and decorative glass; heavy glass  
doors and enclosures, spandrel,  
fire-rated glass.**Vitrum Glass Group**Langley, British Columbia,  
Canada  
vitrum.ca**Employees:** 500**Certifications:** Guardian Select  
Fabricator, Kuraray/Sentry-  
Glas, Saint-Gobain, Vitro/PPG  
Certified Fabricator**No. of locations:** Two**Products offered:** Tempered,  
insulating, laminated and decorative glass; bent glass.

\*Annual sales volume is an estimate, not confirmed by the company. \*\* Certification listings are not necessarily comprehensive. They reflect only those certifications publicly promoted by the respective certifying organizations.

# THE TOP GLASS AND METAL FABRICATORS

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*Among the leading glass fabricators in the United States and Canada are several companies that also manufacture architectural aluminum products for storefront and curtain wall applications, using their own proprietary lines and dies. Due to their unique product offerings, they are ranked separately from the Top Glass Fabricators, here. Services and locations are limited to glass fabrication only. For information on these companies' metal fabrication capabilities, please see Glass Magazine's Top Metal Companies rankings in the November 2017 issue.*

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## More than \$500 million

### **Oldcastle BuildingEnvelope**

Dallas  
obe.com

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**Employees:** 6,600+  
**No. of locations:** 76  
**Products offered:** Custom-engineered curtain wall and window wall; architectural windows; storefront and entrance systems; skylights; blast- and hurricane-resistant systems; architectural glass including: tempered, insulating, laminated, structural, decorative; custom hardware products and supplies.

## \$250-500 million

### **Tecnoglass SA**

Barranquilla, Colombia  
tecnoglass.com

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**Employees:** 5,345  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, NSG/Pilkington, Saint-Gobain, Vitro/PPG Certified Fabricator  
**No. of locations:** Five  
**Products offered:** Tempered, insulating, laminated and decorative glass; low-emissivity glass, insulating-laminated glass, curved glass.  
*Although it does not have fabrication facilities in North America, Tecnoglass has a major presence in the United States, and is therefore included in this list.*

### **Trulite Glass & Aluminum Solutions**

Peachtree City, Ga.  
trulite.com

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**Employees:** 2,900  
**Certifications:** AGC, IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, NSG/Pilkington, Vitro/PPG Certified Fabricator  
**No. of locations:** 34  
**Products offered:** Tempered, insulating, laminated and decorative glass; fire-rated glass.

### **SIGCO Inc.**

Westbrook, Maine  
sigcoinc.com

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**Employees:** 235  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, Vitro/PPG Certified Fabricator  
**No. of locations:** Two  
**Products offered:** Tempered, insulating and laminating glass; ceramic frit spandrel.

**\$35-50 million**

## \$50-100 million

### **Coral Industries Inc.**

Tuscaloosa, Ala.  
coralind.com

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**Employees:** 450  
**Certifications:** SGCC  
**No. of locations:** Three  
**Products offered:** Tempered glass.

### **PRL Glass and Aluminum**

City of Industry, Calif.  
prlglass.com

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**Employees:** 450  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Vitro/PPG Certified Fabricator  
**No. of locations:** Three  
**Products offered:** Tempered, insulating, laminated and decorative glass; custom architectural glass/metal.

### **Aldora Aluminum and Glass Products\***

Coral Springs, Fla.  
aldora-architectural.com

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**Employees:** 350  
**Certifications:** SGCC, Guardian Select Fabricator, Kuraray/SentryGlas  
**No. of locations:** Five  
**Products offered:** Tempered, insulating, laminated and decorative glass; fire-rated glass, spandrel and insulated-laminated glasses.



**\$35 to \$50 million****Custom Glass Products**

Weston, Wis.

customglassproductswi.com

**Employees:** 210

**Certifications:** AGC, IGCC, SGCC, Guardian Select Fabricator

**No. of locations:** Two

**Products offered:** Tempered and insulating glass; heavy glass.

**J.E. Berkowitz LP**

Pedricktown, N.J.

jeberkowitz.com

**Employees:** 200

**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, Vitro/PPG Certified Fabricator

**No. of locations:** One

**Products offered:** Tempered, insulating, laminated glass and decorative; silkscreen.

*J.E. Berkowitz is a Consolidated Glass Holdings company*

**Nashville Tempered Glass Inc.**

Nashville, Tenn.

ntglass.com

**Employees:** 190

**Certifications:** AGC, Guardian Select Fabricator, Kuraray/SentryGlas, Vitro Certified Fabricator

**No. of locations:** Two

**Products offered:** Tempered, insulating, laminated and decorative glass; bent-tempered glass, spandrel, heat-soaked, tech glass, jumbo laminated glass.

**Northwestern Industries**

Seattle

nwiglass.com

**Employees:** About 400

**Certifications:** Guardian Select Fabricator, Vitro/PPG Certified Fabricator, Vitro/PPG Certified Laminator

**No. of locations:** Two

**Products offered:** Tempered, insulating and laminated glass.

**Solar Seal**

South Easton, Mass.

solarseal.com

**Employees:** 180

**Certifications:** AGC, IGCC, SGCC, Guardian Select Fabricator, NSG/Pilkington, Vitro Certified Fabricator

**No. of locations:** Three

**Products offered:** Tempered, insulating and decorative glass.

*Solar Seal is a subsidiary of Consolidated Glass Holdings, Grey Mountain Partners*

**Virginia Glass Products Corp. / Virginia Mirror Co.**

Ridgeway, Va.

va-mirror.com

**Employees:** 170

**Certifications:** Guardian Select Fabricator

**No. of locations:** Two

**Products offered:** Tempered, laminated and decorative glass.

**\$20 million to \$35 million****AGNORA - Architectural Glass North America**

Collingwood, Ontario, Canada

agnora.com

**Employees:** 65

**Certifications:** SGCC, IGCC, Kuraray/SentryGlas, NSG/Pilkington, Saint-Gobain

**No. of locations:** One

**Products offered:** Tempered, insulating, laminated and decorative glass; oversized glass.

**Bendheim\***

Wayne, N.J.

bendheim.com

**No. of locations:** Two

**Products offered:** Tempered, laminated and decorative glass.

**CamGlass**

Broken Arrow, Okla.

camglass.com

**Employees:** 100

**No. of locations:** One

**Products offered:** Tempered, laminated and decorative glass.

**Dillmeier Glass**

Van Buren, Ark.

dillmeierglass.com

**Employees:** 150

**Certifications:** SGCC

**No. of locations:** One

**Products offered:** Tempered, laminated and decorative glass; low-iron, acid etch and pattern glass.

**Garibaldi Glass Industries Inc.**

Burnaby, British Columbia, Canada

garibaldiglass.com

**Employees:** 215

**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas

**No. of locations:** One

**Products offered:** Tempered, insulating, laminated and decorative glass; heat-soaked glass.

**Glass and Mirror Craft**

Wixom, Mich.

glassandmirrorcraft.com

**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas

**No. of locations:** One

**Products offered:** Tempered, insulating, laminated and decorative glass.

**GlassSource**

Grand Haven, Mich.

glasssource.net

**Employees:** 110

**Certifications:** Guardian Select Fabricator

**No. of locations:** One

**Products offered:** Tempered and decorative glass.

\*Annual sales volume is an estimate, not confirmed by the company. \*\* Certification listings are not necessarily comprehensive. They reflect only those certifications publicly promoted by the respective certifying organizations.

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online at [www.DFIsolutions.com](http://www.DFIsolutions.com)



### Glaz-Tech Industries Inc.\*

Tucson, Ariz.  
glaztech.com

**Employees:** 200  
**Certifications:** Guardian Select Fabricator  
**No. of locations:** Eight  
**Products offered:** Tempered, insulating and laminated glass.  
*Glaz-Tech Industries also carries a storefront aluminum product line at one of its locations.*

### Global Security Glazing

Selma, Ala.  
security-glazing.com

**Employees:** 88  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, Vitro/PPG Certified Fabricator  
**No. of locations:** One  
**Products offered:** Tempered, insulating and laminated glass; protective glazing.  
*Global Security Glazing is a division of Consolidated Glass Holdings, Grey Mountain Partners*

### Goldray Glass\*

Calgary, Alberta, Canada  
goldrayglass.com

**Employees:** 110  
**Certifications:** SGCC  
**No. of locations:** Two  
**Products offered:** Tempered, laminated and decorative glass.

### Insulite Glass Co.

Olathe, Kan.  
insuliteglass.com

**Employees:** 175  
**Certifications:** AGC, IGCC, SGCC, Guardian Select Fabricator, NSG/Pilkington, Vitro/PPG Certified Fabricator  
**No. of locations:** Two  
**Products offered:** Tempered, insulating, laminated and decorative glass; spandrel glass.

### Multiver Ltd.\*

Québec City, Québec, Canada  
multiver.ca

**Employees:** 400  
**Certifications:** IGCC, SGCC  
**No. of locations:** Two  
**Products offered:** Tempered, insulating, laminated and decorative glass; heat-soaked glass; manual or motorized integrated blinds.

### Paragon Tempered Glass LLC

Antwerp, Ohio  
paragontemperedglass.com

**Employees:** 165  
**Certifications:** SGCC, Guardian-Anti-Reflective Coating, NSG/Pilkington  
**No. of locations:** Two  
**Products offered:** Tempered, insulating and decorative glass; bent-tempered glass.

### Rochester Insulated Glass

Manchester, N.Y.  
rochesterinsulatedglass.com

**Employees:** 85  
**Certifications:** Guardian Select Fabricator, Kuraray/SentryGlas, Vitro/PPG Certified

Fabricator

**No. of locations:** One  
**Products offered:** Tempered, insulating, laminated and decorative glass; oversized glass.

### Skyline Design

Chicago  
skydesign.com

**Employees:** 100  
**No. of locations:** One  
**Products offered:** Tempered, laminated and decorative glass.

### Standard Bent Glass

Butler, Pa.  
standardbent.com

**Employees:** 120  
**Certifications:** SGCC, Guardian Select Fabricator, Kuraray/SentryGlas  
**No. of locations:** One  
**Products offered:** Tempered, insulating, laminated and decorative glass; security glass.

### Syracuse Glass Co.

Syracuse, N.Y.  
syracuseglass.com

**Employees:** 100  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, NSG/Pilkington, Vitro/PPG Certified Fabricator  
**No. of locations:** One  
**Products offered:** Tempered, insulating and laminated glass; fire-rated, spandrel glass.

### Thompson I.G.

Fenton, Mich.  
thompsonig.com

**Employees:** 150  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, NSG/Pilkington, Vitro/PPG Certified Fabricator  
**No. of locations:** One  
**Products offered:** Tempered, insulating, laminated and decorative glass; dynamic glass; bullet-resistant glass.

### W.A. Wilson Inc.\*

Wheeling, W.V.  
wawilsonglass.com

**Employees:** 95  
**Certifications:** Guardian Select Fabricator, Vitro/PPG Qualified Fabricator  
**No. of locations:** One  
**Products offered:** Tempered and insulating glass; spandrel glass.

### \$10 to \$20 million

### Columbia Commercial Building Products

Rockwall, Texas  
ccbpwin.com

**Employees:** 60  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Vitro/PPG Certified Fabricator  
**No. of locations:** One  
**Products offered:** Tempered and insulating glass.

\*Annual sales volume is an estimate, not confirmed by the company. \*\* Certification listings are not necessarily comprehensive. They reflect only those certifications publicly promoted by the respective certifying organizations.



### Complete Line Glass Fabricators - Distributors

San Antonio, Texas  
completelineglass.com

Employees: 75  
Certifications: AGC  
No. of locations: Two  
Products offered: Tempered and insulating glass.

### Consolidated Glass Corp.

New Castle, Pa.  
cgcglass.com

Employees: 75  
Certifications: SGCC, Guardian Select Fabricator, Vitro/PPG Certified Fabricator  
No. of locations: One

Products offered: Tempered and decorative glass; heat-soaking.

### Dlubak Corp.

Blairsville, Pa.  
dlubakglass.com

Employees: 90  
Certifications: IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, Vitro/PPG Certified Fabricator  
No. of locations: One  
Products offered: Tempered, insulating, laminated and decorative glass; bent and curved glass; protective glazing.  
*Dlubak is a division of Consolidated Glass Holdings, Grey Mountain Partners*

### EFI\*

Kernersville, N.C.  
efi-us.com

Employees: 85  
Certifications: SGCC, NSG/Pilkington  
No. of locations: One  
Products offered: Tempered, laminated and decorative glass; glass shelving; marker-boards.

### Flat Glass Distributors

Jacksonville, Fla.  
flatglassdistributors.com

Employees: 70  
Certifications: AGC, IGCC, SGCC, Guardian Select Fabricator  
No. of locations: One

Products offered: Tempered, insulating and decorative glass.

### GlasPro Inc.\*

Santa Fe Springs, Calif.  
glas-pro.com

Employees: 90  
No. of locations: One  
Products offered: Tempered, insulating, laminated and decorative glass.

### Glass Dynamics

Stoneville, N.C.  
glassdynamics.com

Employees: 130  
Certifications: IGCC, SGCC, Guardian Select Fabricator, Vitro/PPG Certified Fabricator

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## The List

**No. of locations:** One  
**Products offered:** Tempered, insulating, laminated and decorative glass.

### Glenny Glass Co.

Cincinnati, Ohio  
 glennyglass.com

**Employees:** 95  
**Certifications:** IGCC, SGCC, Guardian Select Fabricator, NSG/Pilkington  
**No. of locations:** Two  
**Products offered:** Tempered, insulating, laminated and decorative glass; spandrel glass; beveling; integrated blinds.

### InKan Ltd.

Brampton, Ontario, Canada  
 inkan.ca

**Employees:** 80  
**Certifications:** SGCC, Kuraray/SentryGlas  
**No. of locations:** Two  
**Products offered:** Tempered, laminated and decorative glass; spandrel glass.

### ITI Glass\*

Bel Aire, Kan.  
 itiglass.com

**Employees:** 100  
**Certifications:** Vitro Certified Fabricator  
**No. of locations:** One  
**Products offered:** Tempered, insulating and laminated glass;

oversized glass; spandrel glass.

### Kensington Glass Arts

Ijamsville, Md.  
 kensingtonglass.com

**Employees:** 35  
**Certifications:** SGCC, Guardian Select Fabricator, NSG/Pilkington, Vitro/PPG Qualified Fabricator  
**No. of locations:** One  
**Products offered:** Tempered glass.

### M3 Glass Technologies

Irving, Texas  
 m3glass.com

**Employees:** 110  
**Certifications:** SGCC, Guardian Select Fabricator, Kuraray/

SentryGlas, Vitro/PPG Certified Fabricator

**No. of locations:** One  
**Products offered:** Tempered, laminated and decorative glass; glass treads and flooring.

### Midwest Glass Fabricators\*

Highland, Mich.  
 mwgf.com

**Employees:** 112  
**No. of locations:** Two  
**Products offered:** Tempered glass; mirror.

### Precision Glass Bending

Greenwood, Ark.  
 e-bentglass.com

**Employees:** 100

*\*Annual sales volume is an estimate, not confirmed by the company. \*\* Certification listings are not necessarily comprehensive. They reflect only those certifications publicly promoted by the respective certifying organizations.*

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## TOP GLASS FABRICATORS

**Certifications:** SGCC, IGCC, Guardian Select Fabricator, Kuraray/SentryGlas, NSG/Pilkington

**No. of locations:** One

**Products offered:** Tempered, insulating, laminated and decorative glass.

### TBM Inc.

Santa Ana, Calif.  
tbmglass.com

**Employees:** 50

**Certifications:** SGCC, Kuraray/SentryGlas

**No. of locations:** One

**Products offered:** Tempering, insulating and laminated glass; bullet-resistant glass, glass flooring and stair treads.

### Triview Glass Industries

City of Industry, Calif.  
triviewglass.com

**Employees:** 105

**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Kuraray/SentryGlas, NSG/Pilkington

**No. of locations:** One

**Products offered:** Tempered, insulating, laminated and decorative glass; fire-rated and anti-reflective glass.

### United Plate Glass Co.\*

Butler, Pa.  
unitedplateglass.com

**Employees:** 120

**Certifications:** IGCC, SGCC, Guardian Select Fabricator, Vitro Certified Fabricator

**No. of locations:** Three

**Products offered:** Tempered and insulating glass.

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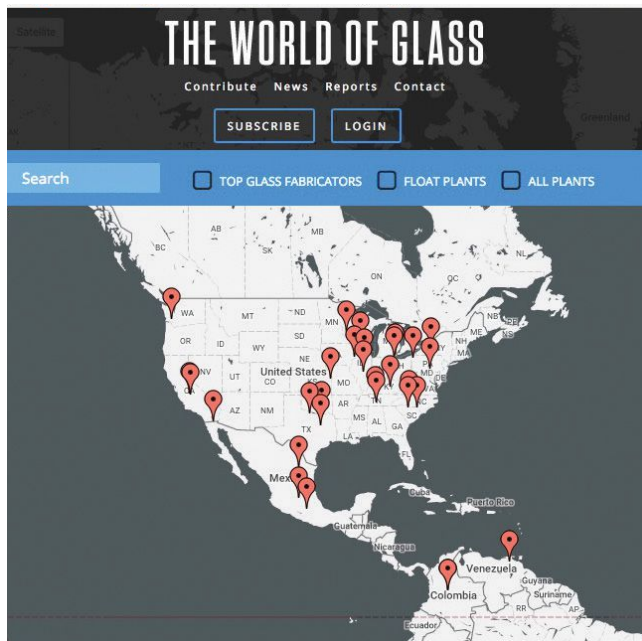
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## The List

## TOP GLASS FABRICATORS

### Woon-Tech

Whitinsville, Mass.  
[woon-tech.com](http://woon-tech.com)

Employees: 60

Certifications: SGCC, Guardian Select Fabricator, NSG/Pilkington

No. of locations: One

Products offered: Tempered, laminated and decorative glass; safety, fire-rated, mirror, shower guards and bird glass.

### \$5 million to \$10 million

### All Counties Glass Distribution

Stockton, Calif.  
[allcountiesglass.com](http://allcountiesglass.com)

Employees: 40

Certifications: IGCC, SGCC, Guardian Select Fabricator

No. of locations: One

Products offered: Tempered and insulating glass; mirror; spandrel.

### Dependable Glass Works

Covington, La.  
[dependableglass.com](http://dependableglass.com)

Employees: 35

Certifications: AGC, Guardian Select Fabricator, NSG/Pilkington, Vitro/PPG Certified Fabricator

No. of locations: Two

Products offered: Tempered and insulating glass; edge-work, beveling, v-grooves and water jet cut.

### Dundy Glass & Mirror Corp.\*

Springfield Gardens, N.Y.  
[dundyglass.com](http://dundyglass.com)

Employees: 25

Certifications: NSG/Pilkington, Kuraray/SentryGlas

No. of locations: One

Products offered: Tempered, insulating, laminated and decorative glass; back painted glass.

### Galaxy Glass & Stone\*

Fairfield, N.J.  
[galaxycustom.com](http://galaxycustom.com)

Employees: 45

Certifications: SGCC, Kuraray/SentryGlas

No. of locations: One

Products offered: Laminated and decorative glass.

### Shower Doors & More Inc.

Ft. Lauderdale, Fla.  
[showerdoors.com](http://showerdoors.com)

Employees: 29

Certifications: SGCC

No. of locations: One

Products offered: Tempered, insulating glass and decorative glass.

### Tempco Glass Fabrication

Flushing, N.Y.  
[tempcoglass.com](http://tempcoglass.com)

Employees: 53

Certifications: SGCC, IGCC

No. of locations: One

Products offered: Tempered and insulating glass.

\*Annual sales volume is an estimate, not confirmed by the company. \*\* Certification listings are not necessarily comprehensive. They reflect only those certifications publicly promoted by the respective certifying organizations.

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## 03 Anti-jump mechanism

Simple activation of anti-jump mechanism.

## 04 Height adjustment

Door panel height adjustment available any time.

## 05 Clip-on mounting

To fit cover, simply twist clip-on mounting into track rail, then clip on profile from below.

## 01 DORMOTION

No cutouts required in glass. The damping mechanism simply mounts on the door panel and clamps tight.

## 02 DORMOTION start/stop

Mounts on track rail, secured by a clamping screw.

03

05

02

01

04

06

## 06 End stops

Clamp fit enables end stops to be installed, adjusted with ease.

MUTO Comfort — our manual sliding door system — is so easy to install, you'll think we're hiding something. We are! The compact header conceals multiple options and adjustable controls to enhance convenience and operation. Plus, glass cutting or drilling is not required — making MUTO the new standard for quick, precise and hassle-free installation. Versatile, convenient, compact and easy to install — MUTO is one smooth operator.

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# GLASS FOR HEALTH

HEALTHCARE FACILITIES AND HOSPITALS LOOK TO GLASS FOR PATIENT RECOVERY, DECORATIVE DESIGN, SECURITY AND MORE



**I**N RECENT YEARS, glass has emerged as a critical design element for hospitals and healthcare facilities. Ample glass on the interior and exterior allows natural daylight to penetrate deeper into buildings, promoting patient comfort and accelerating recovery.

“Light impacts outcomes in healthcare settings by reducing depression among patients, decreasing length of stay in hospitals, improving sleep and circadian rhythm, lessening agitation among dementia patients, easing pain and improving adjustment to night-shift work among staff,” according to the Center for Health Design’s *The Impact of Light on Outcomes in Healthcare* report, which provides a comprehensive look at numerous studies on the effects of daylighting on health.

According to a 2016 Dodge Data & Analytics, construction.com, report on biophilic design, hospital

patients with views of nature saw length of stays fall 8.5 percent, and patients in daylit rooms requested 22 percent less pain medication.

From glazed façades to interior glass railings and partitions, glass allows architects to meet goals for patient-centric design. And, designers increasingly want more from their glass products for healthcare applications. Designers are pushing the envelope even further by looking for glass in healthcare facilities that also provides elements of decorative design, meets occupant security requirements, offers privacy to patients and more.

The following glass Idea Book offers a wide range of examples of glass in healthcare facilities, from glass and metal modern exteriors to decorative interior and exterior solutions. For more examples of glass in healthcare facilities, visit [GlassMagazine.com/March2018](http://GlassMagazine.com/March2018).



# NG



**DESIGNED FOR COMFORT** The glass- and metal-clad Legacy ER in Allen, Texas, is a freestanding emergency and urgent care facility designed for patient comfort and wellness. The 8,500-square-foot building features a modern design and simplified interior layout intended to create a calming environment for patients. Natural light, provided through the curtain wall enclosure, further promotes this goal. YKK AP, [ykkap.com](http://ykkap.com), supplied its YCW 750 SSG curtain wall, YCW 750 SplineTech curtain wall and YKK AP 35D entrance door for the project. MetalTech-USA, [metaltch-usa.com](http://metaltch-usa.com), fabricated zinc panels for the exterior. 5G Studio Collaborative, [5gstudio.com](http://5gstudio.com), was the architect, and Southern Glass & Mirror, [sgmplano.com](http://sgmplano.com), the contract glazier.



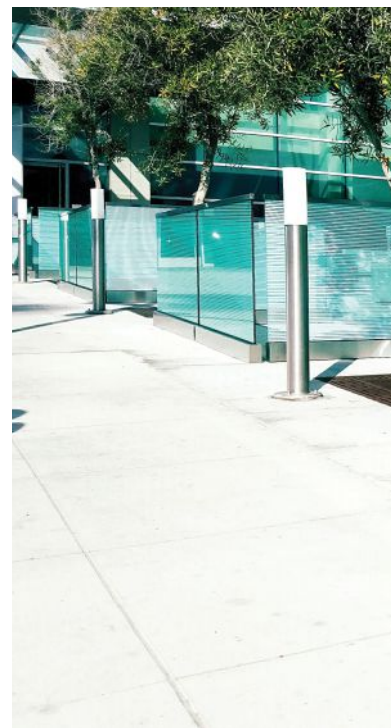
**Online:** For additional examples of glass in healthcare facilities, visit [GlassMagazine.com/March 2018](http://GlassMagazine.com/March2018).



**DECORATIVE DNA** A 10-by-38-foot decorative glass installation spans the four-story main stairwell at the Brigham and Women's Hospital - Building of Transformative Medicine in Boston. The decorative wall consists of 15 individual laminated glass units consisting of two lites of 1/4-inch Starphire tempered glass with a .060 custom decorative urethane interlayer. Surface No. 1 and No. 4 are laser engraved with a DNA sequence that starts at the bottom left and spans the wall. Quality Glass Works Inc., Watertown, Connecticut, was the glass fabricator; Vitro Architectural Glass, [vitroglazings.com](http://vitroglazings.com), was the glass manufacturer. The project architect was NBBJ, [nbbj.com](http://nbbj.com), and the Cheviot Corporation, [cheviotcorp.com](http://cheviotcorp.com), the contract glazier.



**HIGH-PERFORMANCE VIEWS** The three-story, 230,000-square-foot Promedica Health and Wellness Center in Sylvania, Ohio, features two open-air courtyards and a glass atrium that flood the gallery space with natural light and provide visual access to the outdoor environment. Architects from HKS Inc. chose Solarban 72 solar control low-emissivity glass with an ultra-transparent Starphire glass substrate to maximize the effects of that natural light and to provide a calm, healing aesthetic to patients. Vitro Architectural Glass, [vitroglazings.com](http://vitroglazings.com), was the glass manufacturer; Oldcastle BuildingEnvelope, [obe.com](http://obe.com), was the glass fabricator. Toledo Mirror and Glass, [toledomirror.com](http://toledomirror.com), served as glazing contractor, and VM Systems, [vmsystemsinc.com](http://vmsystemsinc.com), as the façade contractor. *Photo by Jim Cunningham.*







**QUIET AND CALM OUTDOORS** Patterned glass railings enclose the Healing Garden at Kaiser Permanente Los Angeles Medical Center, a peaceful exterior space for hospital patients and visitors. The perimeter guardrail features a blue/green laminated glass that improves the acoustic ambiance of the garden and serves as a windscreen. C.R. Laurence Co., [crlaurence.com](http://crlaurence.com), supplied its GRS Taper-Loc and GRS 1202 Glass Gate systems for the project; Trulite, [trulite.com](http://trulite.com), fabricated the glass; Giroux Glass, [girouxglass.com](http://girouxglass.com), was the glazing contractor. *Photo by Carlos Gomez, Giroux Glass.*

**LIGHT AND BRIGHT INSIDE** BWBR Architects, [bwbr.com](http://bwbr.com), designed the four-story, 130,000-square-foot HealthPartners Neuroscience Center, in St. Paul, Minnesota, to bring as much natural sunlight into the building as possible. Interior glass railings proved essential to achieving this goal, allowing unobstructed views to the outdoors and natural light throughout the main lobby and multi-level parking entranceway. The project features 541 linear feet of Trex Commercial Products', [trexcommercial.com](http://trexcommercial.com), Dot series glass railing with ½-inch clear tempered glass on staircases ascending multiple levels and on balcony overlooks. Oldcastle BuildingEnvelope, [obe.com](http://obe.com), was the glass fabricator, and MG McGrath Architectural Glass and Glazing, [mgmcgrath.com/architectural-glass-glazing](http://mgmcgrath.com/architectural-glass-glazing), the glazing contractor.





**ON-DEMAND PRIVACY** Healthcare environments demand privacy solutions for patients. Switchable privacy glass provides a privacy solution that mitigates the infection risk inherent with more traditional window coverings, according to officials from Vistamatic, [vistamatic.com](http://vistamatic.com). The company supplied its electronic switchable privacy glass to CapRock Hospital in College Station, Texas. The project features Vistamatic Clarity Smartglass with a liquid crystal interlayer that can switch from an opaque state to clear state with a switch of a button, allowing for both patient privacy and discrete staff observation. PhiloWilke Partnership, [pwarch.com](http://pwarch.com), served as architect, and Austin Glass & Mirror, [austinglass.com](http://austinglass.com), as glazing contractor.



**PROTECT AND PERFORM** Protective glazing products allowed architects from RLF Architects, [rlfarchitects.com](http://rlfarchitects.com), U.S. Army Corps of Engineers to meet requirements for patient care and healing, along with fire-rated building codes and Department of Defense Anti-terrorism Standards at a new Army hospital in California. For the exterior, Safti First, [safti.com](http://safti.com), supplied its GPX Blast System, a two-hour fire-resistive, blast-rated curtain wall. For the interior, the company supplied the SuperLite II-XL 60 and 120 in GPX Architectural Series Framing for the one-hour fire-resistive atrium wall with warm gray spandrel for a decorative effect, and two-hour fire-resistive glazing for the stairwells. The glazing contractor was Sashco Inc., [sashcoinc.com](http://sashcoinc.com).



# Perfect glass handling solutions for on-site and in-shop



## Vector 880

- Lifting capacity up to 880 Lbs
  - Dual vacuum systems
  - Self-propelled
  - Precision adjustment for glazing
  - Glazes overhead
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  - 24V electrical system
- Options include:**
- Capacity to lift stone and curved glass

 [bit.ly/vector-onsite](https://bit.ly/vector-onsite)



## Forklift Glassboy 880

- Lifting capacity up to 880 Lbs
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  - Side pivot glass either side for narrow access
  - 360 degrees manual rotation
  - Easily secures to forklift
  - Dual vacuum systems
  - Safety chain
- Options include:**
- Upgrade to 1320 Lbs
  - Capacity to lift stone and curved glass

 [bit.ly/forklift-glassboy](https://bit.ly/forklift-glassboy)



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# Industry Products

## Top Glass Fabricators

Top Glass Fabricators, featured on pages 32-54, have introduced a range of new products designed to meet market demands, from calls for better thermal performance to additional capabilities and flexibility in decorative glass. The following are several new Top Glass Fabricator product introductions. For more, visit [GlassMagazine.com/March2018](http://GlassMagazine.com/March2018).



### Decorative Patterns from Skyline Design

Skyline Design introduced Transcend, a collection of six etched and printed glass patterns by designer Suzanne Tick. The patterns of Transcend are designed to intersect, overlap or fade, allowing for different degrees of translucency and privacy. Designers can customize scale, color and technique to meet project needs. Transcend is available on clear tempered safety glass and low-iron tempered safety glass, and in sizes up to 60 by 120 inches in standard glass thicknesses.

773/969-5886 | [skydesign.com](http://skydesign.com)

### Glass Engraving from Triview Glass Industries

Triview Glass Industries developed LaserLite Glass, a process for 3-D and 2-D engraving in and on glass substrates, including mirrors. Custom imagery, including photography, custom patterns and artwork, is captured into a monolithic glass panel. Glass illuminates readily, with standard LED and/or RGB LED strip lighting. Laser-Lite can be used for feature walls, interior and exterior graphics, signage, corporate identity, artistic imagery and other creative applications. The glass can be tempered or laminated after engraving. The process can be applied to substrates of any thickness in sizes up to 9 by 30 feet.

800/452-7745 | [triviewglass.com](http://triviewglass.com)

### Jumbo Printing from Vitrum Glass Group

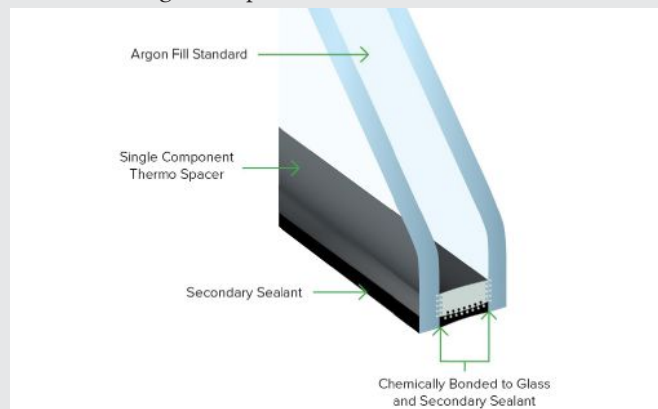
To meet demand for larger glass sizes, Vitrum Glass Group now offers digital printing with ceramic inks in sizes up to 110 by 200 inches. With unlimited colors, opacities and design options, glaziers and architects can realize their design vision without the cost and challenges of silk-screens, according to company officials. Customers can supply their



own artwork or choose from one of Vitrum's exclusive ready-to-print designs. Vitrum's digital printing is suitable for a wide range of interior and exterior applications, and may be combined with laminated and tinted glass. 604/882-3513 | [vitrum.ca](http://vitrum.ca)

### Thermal Spacer from Viracon

Viracon introduced the Viracon Thermal Spacer, a new thermal spacer technology that replaces the traditional combination of metal spacer, desiccant and primary sealant with a single component. The formulation of VTS



consists of a black thermoplastic with integrated desiccant and primary sealant that is chemically bonded directly to the glass and secondary silicone sealant. The technology has been engineered to outperform conventional and other thermoplastic spacer systems, according to company officials. The extrusion of the thermoplastic along the edge of glass results in a smooth, continuous, matte black finish, delivering a monolithic aesthetic.

800/533-2080 | [viracon.com](http://viracon.com)



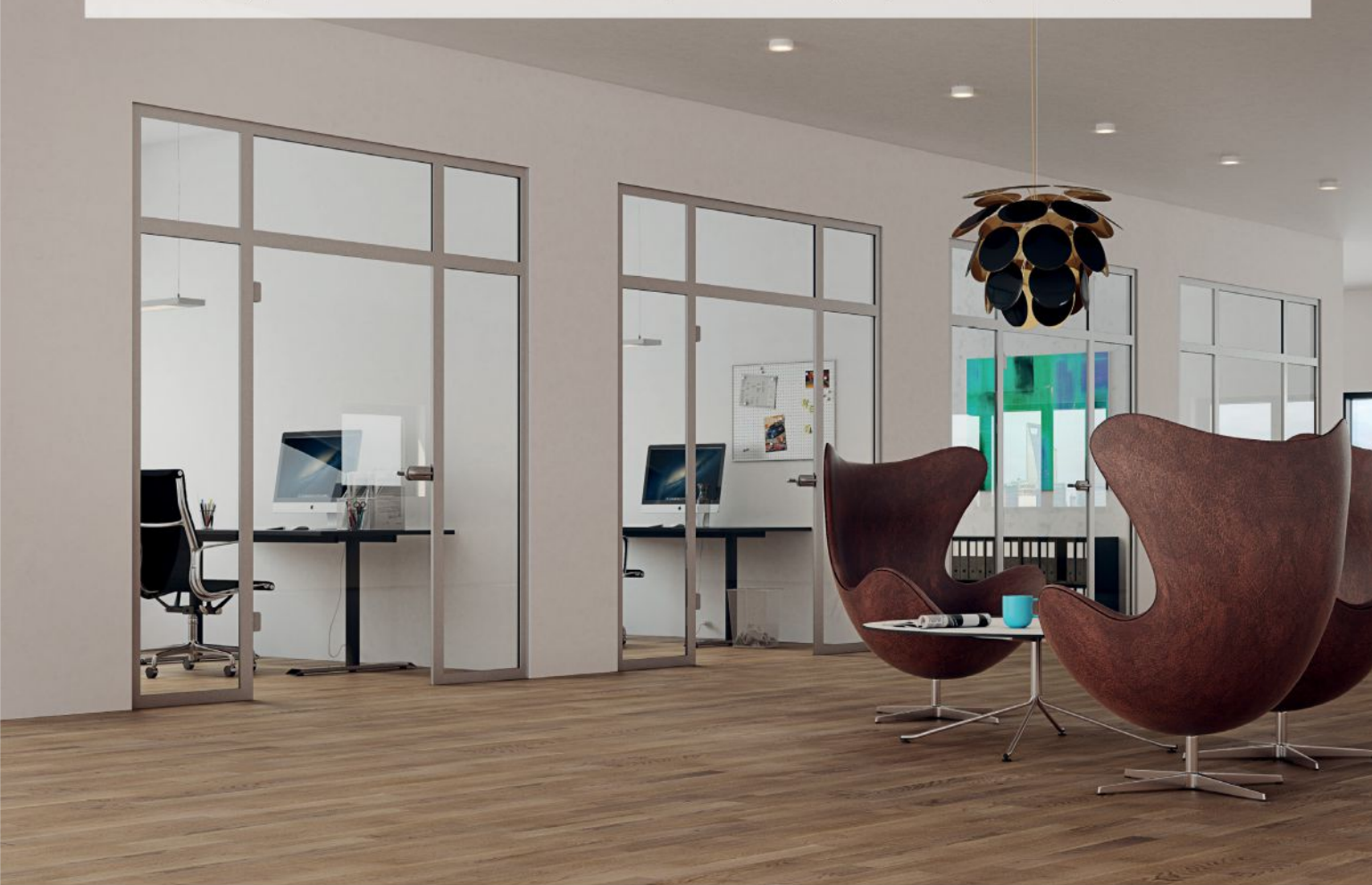
# Rethink interior hardware...



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## Practical Solutions for the Glass Professional



### Architectural glass

#### Customized coating service

Interpane launched Coating on Demand, a service for designers and architects that allows them to create a completely custom, from-scratch, high performance low-emissivity coating. Coating on Demand allows designers to run a simulation of the custom glass on realistic renderings of the building and make demo samples. The process includes a one-day session where designers and architects can choose their design, play with glass color and performance, and calculate thickness. Through the Coating on Demand software, designers can also determine the composition of the glass based on the application type, load requirements, thermal requirements and soundproofing estimates. 781/927-4118 | interpane.com

#### Low-iron glass

AGC Glass developed Clearvision low-iron glass. Available in laminated, heat-treated, bent, silk-screened or insulated configurations, Clearvision can be specified for interiors and exteriors. When used in an insulating glass assembly, Clearvision's double- and triple-glazing units provide 92 percent light transmission and maximize solar energy. In addition to its commercial architecture applications, Clearvision is optimal for



residential applications, such as frameless and heavy glass shower enclosures, custom tabletops, shelving and display cases. Clearvision can be specified in a wide range of thicknesses, from 3 millimeters to 12 mm, with custom thicknesses available upon request. Clearvision is also Cradle to Cradle Certified Silver.

404/446-4200 | agcglass.com

#### Solar-control glass

Şişecam Flat Glass introduced a new heat- and solar-control insulating glass, the Şişecam Temperable Solar Control Low-E Neutral 62/44. The glass reduces heat loss from windows by 50 percent compared to traditional insulating glass units, according to the company. Additionally, the 62/44 series glass offers light transmittance of 60 percent and solar control of 43 percent, making it ideal for commercial buildings.

+(90) 8502-0650-50 | sisecam.com

### Curtain wall

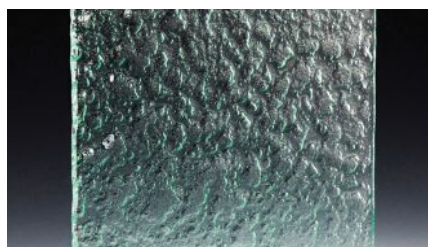
#### Impact system

YKK AP America announced its ProTek impact-resistant products, including the YHC 300 OG high-performance curtain wall, YHC 300 SSG Cassette pre-glazed curtain wall and YHW 60 TU pre-glazed window wall, will be standardized to meet Florida Building Code's revised 2017 Florida Product Approvals. Pre-engineered anchor conditions will be expanded, and the mullion height of the YHC 300 curtain wall will more than double to reach as high as 324 inches. This will allow for bigger spans of pure glass on multi-story buildings, resulting in a cleaner aesthetic and improved daylighting. 678/838-6000 | ykkap.com

### Decorative glass

#### Organic textures

Nathan Allan introduced organic textures to its interior designer glass selections. Organic textures clear or low-iron glass can be installed in wall dividers, partitions, doors, glass balustrades and heavy glass



countertops, with various color options and privacy finishes available. The textured glass is available in standard or custom sizes up to 5 by 10 feet and in thicknesses of 1/4 inch, 3/8 inch or 1/2 inch for safety tempered panels, or 1 1/2 inches for heavy glass countertops. 604/535-8849 | nathanallan.com

#### Pink back-painted glass

Bendheim announced the new ruby swiss chocolate pink back-painted glass. The shade is available on fire-polished, semi-matte and matte Bendheim glass. The anti-glare matte and semi-matte SatinTech options are



perfect for daylight-friendly wall cladding applications, according to company officials. In addition to the ruby chocolate, Bendheim offers a variety of warm pink hues in durable, color-stable architectural glass, including: transparent pink laminated glass, pale pink mirror, and vibrant magenta textured mirror.

800/221-7379 | bendheim.com

### Hardware

#### Electrified mortise locksets

Security Door Controls introduced the MLR Z7600 series motorized latch retraction mortise locksets. Designed for the access control of openings in commercial, industrial and institutional facilities, MLR Mortise Locksets are designed to ensure the door stays latched even when unlocked, maintaining fire-door integrity. MLR locksets comply with all national building and fire life safety code requirements for use on fire-rated doors where the use of electric strikes and magnetic locks is prohibited. The locksets are currently available in fail-secure mode that fea-





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## Industry Products

tures motorized low-current operation, as well as field selectable handing and optional full monitoring capability. 410/248-9228 | [sdsecurity.com](http://sdsecurity.com)

### Interlayers and films

#### Protection film

Lamatek introduced Protek surface protection films to protect glossy and semi-matte surfaces. The films can be used to protect bare metals, pre-coated metals, aluminum profiles and glass against dust, scrapes, surface contaminants and UV rays during production,

installation, shipping and handling. Protek utilizes high-tack, residue-free adhesives that remove cleanly even after extended outdoor aging, according to company officials. Protek can be specified to indoor and outdoor protection on a variety of sizes and components. 856/599-6000 | [lamatek.com](http://lamatek.com)

### Machinery and equipment

#### Crawler crane

Maeda announced the CC1485 telescopic boom crawler crane, which replaces Maeda's LC785 model. The

CC1485 features a 6.6-ton maximum lift capacity, a 98-inch wide, heavy-duty steel undercarriage and hydrostatic transmission. The crane offers a no-outrigger design with a 72.2-foot maximum hook height and near-zero tail swing. It also includes an available fly jib with multiple offset angles, black rubber or non-marking bolt-on track pads, single-part line ball and hook, and railroad rail drive attachment. 713/715-1500 | [maedausa.com](http://maedausa.com)

#### Cutting table

Biesse Group introduced the Genius RS-A cutting table. The Genius RS-A comes standard with Windows-based software, a loading tilt system with arms



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that automatically extend and retract for loading heavy glass, and an optional GCR low-emissivity coating removal system. According to the company, the table's high grade of flatness provides the highest quality scores and fast cutting speeds of up to 200 meters per minute. 704/357-3131 | [biessegroup.com](http://biessegroup.com)

### Resources

#### Website and brochure

Quality Metalcrafts/Americlad launched its new website, [americlad.com](http://americlad.com), and released a new brochure. The new website and 20-page brochure offer architects, building owners and contractors the opportunity to better understand the different types of systems and components



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GGI**



## Industry Products

available to make more informed decisions in their selection process, according to company officials.

734/261-6700 | [qualitymetalcraft.com](http://qualitymetalcraft.com)

### Tools

#### Tool tethers

Gear Keeper introduced Super Coil anchored tool tethers. With a low-force polyurethane elastic core that is woven



working area that can retract to just 42 inches. The tether is designed for tools weighing up to 25 pounds. Super Coil comes in two models: model TL1-4021,

throughout the entire body of the webbing, the Super Coil creates an 18-foot diameter

which has two stainless steel carabiners load rated to a little over half a ton with gates; and model TL1-4025, which includes one stainless steel carabiner and a fixed web tool attachment loop. Both models include 1-inch tether webbing. 888/588-9981 | [gearkeeper.com](http://gearkeeper.com)

### Windows

#### Hinged and fixed windows

Western Window Systems introduced hinged and fixed windows to its Series 7000 aluminum windows and moving glass walls. The windows can be directly mulled to Series 7000 sliding doors, fixed window walls and hinged doors. The systems feature a frame depth that supports triple-pane, laminated and security glass. Depending on glass selection and sill type, U-values



can reach 0.17 for a fixed window with triple-pane glass and 0.32 for a casement window. Windows are NFRC-tested, comply with California's Title 24 requirements and received a performance rating of CW-PG50. 877/268-1300 | [westernwindowssystems.com](http://westernwindowssystems.com)

#### Frameless impact windows and doors

Faour Glass Technologies broadened its Slimpact frameless impact line, increasing the panel size and design pressures of its frameless impact windows by adding frameless impact doors and 90-degree corners. The window panel sizes increased from 5 by 10 feet to 8 by 12 feet, and the design pressures increased from +/- 60 pounds per square foot to +/- 110 pounds per square foot, all while continuing to meet Florida's High Velocity Hurricane Zone wind-borne debris requirements. 800/929-4691 | [faourglass.com](http://faourglass.com)



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BRAND WITH  
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# People

## EFCO

EFCO, [efcocorp.com](http://efcocorp.com), named *Steven E. Westfall* as president, effective Jan. 8. Westfall comes to EFCO from Tuthill Vacuum & Blower in Springfield, Missouri, where he has been president since 2013. He was instrumental in leading the transformation of the 125-year-old, family-owned industrial manufacturing business. From 2008 to 2013, Westfall led two companies owned by private equity firms, CST Storage and Detroit Tool Metal Products. Prior to that, he served as president and CEO of EaglePicher Technologies, a high technology organization that produces batteries for mission critical aerospace, defense and medical markets.

## The Wagner Cos.

The Wagner Cos., [wagnercompanies.com](http://wagnercompanies.com), hired *Michael Dover* as president. He assumes the position previously held by Rick Kettler who retired after an 18-year career with the com-



Dover

pany and a nine-year tenure as president. Dover brings 26 years of extensive manufacturing, sales and marketing experience to the company. For the last ten years, he served as president of Scan-Pac Manufacturing, a producer of industrial friction products targeting the drilling, mining, agricultural and transportation industries.



Price

**CGH**  
Consolidated Glass Holdings, [cghinc.com](http://cghinc.com), appointed *Bob Price* as vice president of strategic architectural sales and *Sam Benowitz* as vice president of point-supported glass and metal sales. As vice president of strategic architectural sales, Price will be responsible for developing CGH's strategic growth accounts, as well as



Benowitz

providing strategic direction to the company's architectural sales teams. As vice president of point-supported glass and metal sales, Benowitz will be responsible for managing the sales team for CGH's complete line of Invisiwall glass systems. They will both work with personnel at Columbia Commercial Building Products in Texas; J.E. Berkowitz in New Jersey; and Solar Seal in Connecticut, Massachusetts and Virginia.

## Paragon Tempered Glass LLC

Paragon Tempered Glass LLC, [paragontemperedglass.com](http://paragontemperedglass.com), named *Dan Wright* president and promoted *Tim Erli* to the position of vice president of finance and accounting. Wright brings over 20 years of leadership experience in the glass industry. As president, Wright will have profit and loss responsibility for the Antwerp, Ohio, and Niles, Michigan, facilities. Erli has been the controller for both Paragon locations since February 2017. He brings 30 years of accounting and leadership experience with over 20 years in the manufacturing sector.

## Bohle America

Bohle America, [bohle-america.com](http://bohle-america.com), hired *Connor Leahy Jr.* as national sales director. Leahy will have responsibility over the inside and outside sales teams and will be charged with continuing to grow Bohle America's sales footprint within North America. He will be based out of Bohle's Charlotte, North Carolina, headquarters. Leahy joins Bohle America with more than a decade worth of sales management experience in the glass industry.



McQueen

## J.E. Berkowitz

J.E. Berkowitz, [jeberkowitz.com](http://jeberkowitz.com), appointed *Gary McQueen* as senior director of sales and marketing. In his new role, McQueen will



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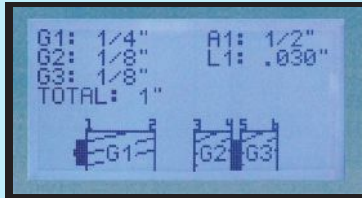
## AWARD WINNING: Glass-Chek ELITE

### Identify Laminated Glass

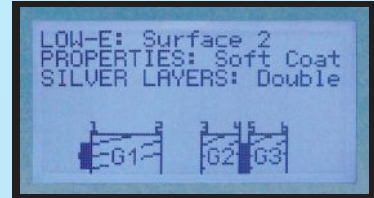
Identify laminated glass in a window, and measure the thickness of the laminate inner-layer. In a special operating mode, identify which piece of glass has the Low-E coating when the Low-E surface is placed against the laminate inner-layer.

### Graphical Display with Window Illustrations

The Graphical Display shows the window drawn approximately to scale, and assigns numbers to each piece of glass and glass surface in the window. This is a great visual aid in understanding the makeup of a window and identifying the



Above: Display example for thickness.



Above: Display example for Low-E.

### Determine Glass Thickness & Identify Low-E Coating

Measure glass, air space and overall IG thickness of single to quad pane windows. Plus, detect the location of a Low-E coating within a window, and differentiate Hard Coat from Soft Coat Low-E while identifying the number of Soft Coat silver layers. This can help users to differentiate between coatings such as Cardinal 272\*

### Many More Features and Expanded Applications

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## Reduce Costly Mistakes & Process Glass Correctly

### Tin Side Detection Lamp



The TS1470 Tin Side Detector is the **perfect solution** for brighter lit environments where it can be difficult to see the glowing tin side of the glass. It is **ideal for testing single pieces of glass**, as well as **stacks of glass that have a small portion of the glass face exposed**. The glowing light from the tin side can be easily viewed on on the glass surface, as well as on the edge of the glass.

- Equipped with a comfortable Ergonomic handle
- Comes standard in a 115V version
- Displays milky white glow when encountering the tin-side of glass

### Low-E Detectors

*Consistent and reliable meters with durable cases and quality electronics.*



Model # AE1601



Model # AE3600

- The "ETEKT+" Double Pane Low-E Detector has been the **industry standard detector for over 25 years**.
- Detect coatings on double pane windows in the field.
- The Single Pane Low-E Detector is **designed for rigorous factory settings**.
- Check both surfaces with a single test - a big time saver in production.

For our whole Low-E product line, visit [edtm.com](http://edtm.com).

Strengthened Glass Detector

Window Energy Profiler

Digital Solar Power Meter



Products are also available through:



EDTM, Inc - Toledo, OH | [www.edtm.com](http://www.edtm.com) | (419) 861-1030 | [sales@edtm.com](mailto:sales@edtm.com)



# People

be responsible for managing JEB's sales, estimating and project management personnel, as well as leading all marketing initiatives. McQueen joined JEB as architectural design manager in September 2014 and transitioned to director of architectural sales in January 2017.



Ludwig

## Quanex Building Products

Quanex Building Products, [quanex.com](http://quanex.com), hired *Brian Ludwig* as Northeast sales manager. Based in New York,

Ludwig will be tasked with growing and expanding Quanex's business in the territory. A 23-year industry veteran, Ludwig has experience through all parts of fenestration operations, including product design, manufacturing, sales and end-user support.



Wright

## Tubelite

Tubelite Inc., [tubeliteinc.com](http://tubeliteinc.com), named *Jeff Wright* as client development manager serving clients in Maryland,

Washington, D.C., and northern Virginia. Based in Baltimore, he reports directly to Patrick Daniels, Tubelite regional sales manager. Wright and Daniels work closely with glazing contractors and architectural teams across the region to assist with storefront, curtain wall, entrances and daylight control systems.

## Barrett Ltd.

Barrett Ltd., [barrettlimited.com](http://barrettlimited.com), hired *Matt Hale* as national business manager, specifically servicing architectural glass and hardware, and emerging markets for Barrett. Hale brings over 38 years of industry experience in float glass, automotive glass, fabricated glass, architectural aluminum, marketing and business development.

## Faour Glass Technologies

Faour Glass Technologies, [faourglass.com](http://faourglass.com), welcomed *Lee Webster* as its new-



Webster

est architectural representative for northern Florida. Webster brings over 20 years' experience in sales and as a business owner. He is also founder and CEO of Fenblik, the U.S. importer of Gaulhofer Windows & Doors, a European manufacturer of luxury windows and doors.



Knuutila

## Glaston

Glaston, [glaston.net](http://glaston.net), hired *Kai Knuutila* as digitalization manager, a newly created position. His goal will be to bring the power

of the Industrial Internet of Things to glass processing equipment. Knuutila spent 13 years working for Nokia in many different roles, including system design and architecture. He then went on to work for Intel Corp. and Trelab, one of Glaston's business partners that focuses on wireless sensor solutions that measure vibration, movement and other performance data in machinery.



Rowson

## Apex Aluminum Extrusions

Apex Aluminum Extrusions, [apexextrusions.ca](http://apexextrusions.ca), welcomed *Ken Rowson* to the role

of director of sales for its Apex Facade Systems division. He will be responsible for developing sales strategies, assisting in product design and leading all sales efforts for Apex's architectural glazing system.



Hernandez

## Washington Glass Association

Washington Glass Association, [wg-a.org](http://wg-a.org), appointed *Patricia Hernandez* as vice president.

Hernandez is the Northwest regional sales manager for Vetrotech Saint-Gobain North America, [\[northamerica.com\]\(http://northamerica.com\). She has more than 25 years of experience in the building materials industry and is active in numerous architectural and professional organizations.](http://saint-gobain-</a></p></div><div data-bbox=)

## Graham Architectural Products

Graham Architectural Products, Curtain Wall Solutions, [grahamwindows.com](http://grahamwindows.com), named *Ken Schmidtchen* general manager and *Fred Grunewald* national sales manager. As general manager, Schmidtchen will oversee the main functions of the business. He joined the company in May 2015 as engineering manager, and in February 2017, he was named operations manager of the facility. Grunewald joined the company in September 2012 as vice president and general manager. Most recently, he has been acting as the main sales contact for the business.

## In Memoriam



de Gorter

## Peter John de Gorter

President and CEO of DeGorter Inc., [degorter.com](http://degorter.com), *Peter John de Gorter*, died suddenly of unknown causes on Dec. 29.

He has been president and CEO of DeGorter Inc. since 1989. After graduating from the University of Miami, he dedicated his life to working in the family business, DeGorter Inc.

## John Hoisington

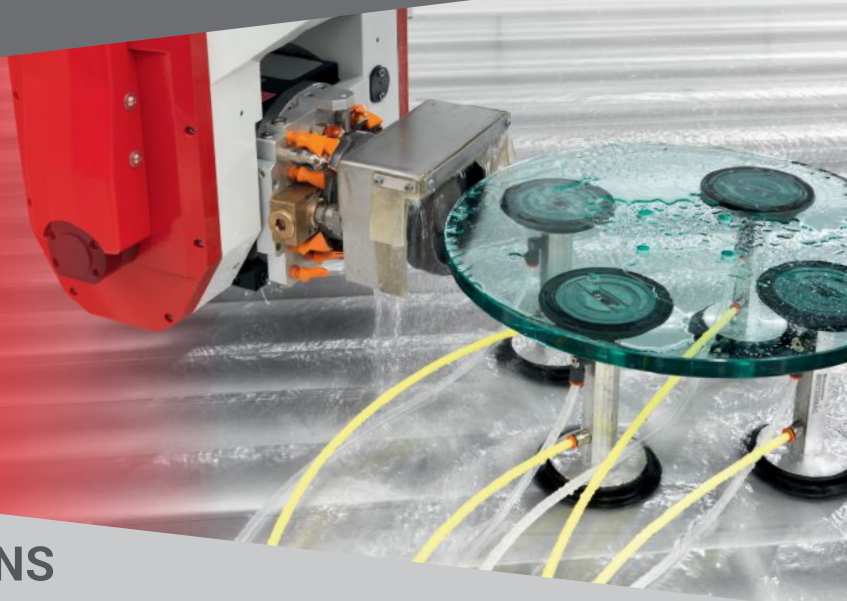
Madison Heights Glass, [mhglass.com](http://mhglass.com), owner *John Douglas Hoisington* passed away at the age of 82 on Nov. 28. He enlisted in the U.S. Navy after high school, serving in the Korean War from June 1952 to December 1955, then entered the glass industry in Michigan after his honorable discharge. By the end of his career, he was recognized by the Glass Dealer's Association for 50 years of excellence. Hoisington is survived by his children Taryn and Janelle, and grandchildren Elise, Shane, Zachary and Ethan.

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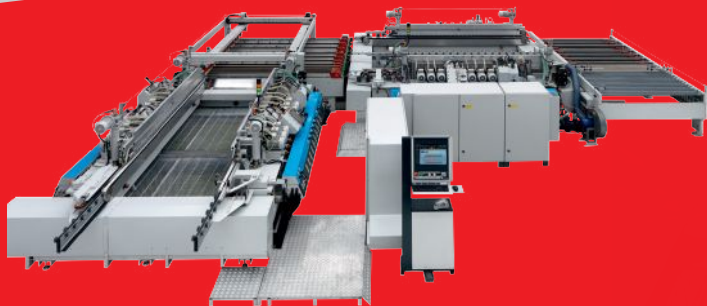
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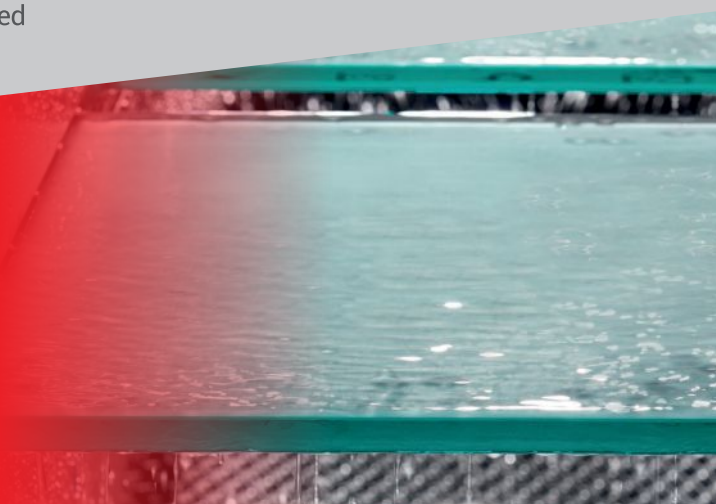
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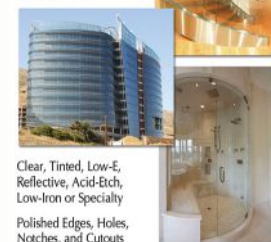
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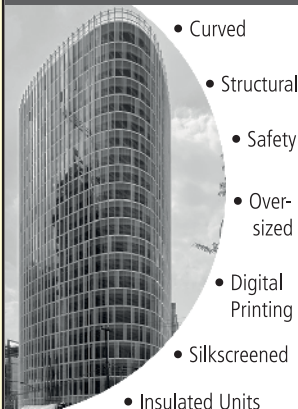
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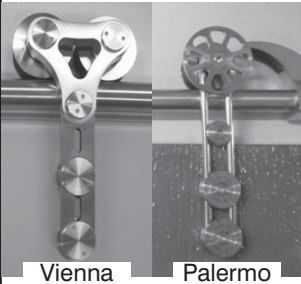
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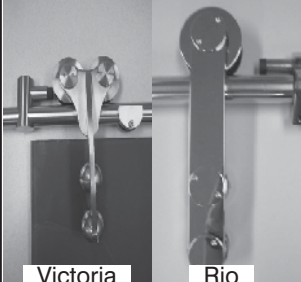
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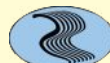
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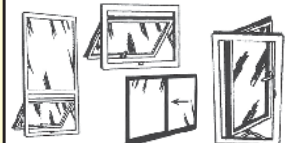
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## Here's an Idea...

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](mailto:ndick@glass.org)



## Winco Window Thinks Big with Micro-housing

As viewers of HGTV shows like “Tiny House Hunters” will know, tiny houses have been trending. Winco Window Co., [wincowindow.com](http://wincowindow.com), recently contributed to Carmel Place micro-apartments in New York City, an urban expansion of the micro-housing trend. Winco’s successful collaboration on the project, designed by nArchitects, may serve as a model for how glass industry companies can take advantage of new and different construction opportunities, both big and small.

Carmel Place is a first in many ways, being the first micro-unit apartment building in New York City. The 55 loft-like units range in size from 260 to 360 square feet, and each comes equipped with a kitchenette, bathroom, bed and storage space. “For New Yorkers, and other major city dwellers, the economics of tiny, yet livable spaces make sense,” says Janet Ryan, marketing representative, Winco Window Co.

The project also represents Winco’s first collaboration on micro-unit construction.

“This was Winco’s first project like this—our rep in NYC had an existing relationship with the architect, and that is how we got involved,” says Ryan.

Winco contributed its 6-by-8-foot sliding windows, chosen to help expand the perceived space, Ryan says. The large windows offer better views and daylighting, as well as ventilation, she explains. “Sliding windows are able to provide ventilation, without taking up any floor space,” says Ryan. “With such a small living space, this was key.”

The project required no extensive adaptation of Winco’s product. In fact, it found that the unique, modular construction of the build simplified the company’s involvement, Ryan says. “The units were assembled in New Jersey and trucked into New York City. Winco shipped the windows directly to the assembly site [and] pre-packaged all the window trim with each window unit, allowing for easy and accurate assembly,” says Ryan. Overall, “the modular offsite construction actually made things easier.”

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President & CEO  
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[nharris@glass.org](mailto:nharris@glass.org)

### EDITORIAL STAFF

**JENNI CHASE**, Content Director  
703/442-4890 ext. 164 • [jchase@glass.org](mailto:jchase@glass.org)  
**KATY DEVLIN**, Editor-in-Chief  
703/442-4890 ext. 162 • [kdevlin@glass.org](mailto:kdevlin@glass.org)  
**BETHANY STOUGH**, Managing Editor & Content Manager  
703/442-4890 ext. 169 • [bstough@glass.org](mailto:bstough@glass.org)  
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703/442-4890 ext. 145 • [ndick@glass.org](mailto:ndick@glass.org)  
**OLIVIA PARKER**, Editorial Assistant  
703/442-4890 ext. 165 • [oparker@glass.org](mailto:oparker@glass.org)  
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[wvardaman@glass.org](mailto:wvardaman@glass.org)  
**CORY THACKER**, Senior Designer  
703/442-4890 ext. 140 • [cthacker@glass.org](mailto:cthacker@glass.org)  
**BETH MOORMAN**, Production Director  
703/442-4890 ext. 122, [bmoorman@glass.org](mailto:bmoorman@glass.org)  
**HARRY BLACKWOOD**, Production & Design Assistant  
703/442-4890 ext. 192 • [hblackwood@glass.org](mailto:hblackwood@glass.org)  
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