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SEPTEMBER/OCTOBER 2020

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”

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**On the cover:** Today's range of software and digital tool solutions offer manufacturers and contractors a variety of options for maximizing efficiency, addressing workforce concerns, ensuring quality and more. However, an investment in such technologies requires company leaders to consider factors such as company processes, employee buy-in and training, and long-term goals. Find out more on page 38.





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### GLAZIERS

#### Stay Positive and Engaged

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### FORECAST

#### The Mental Game

By Max Perilstein,  
Sole Source  
Consulting



## PROJECT NEWS

Featured in e-glass weekly and on GlassMagazine.com. To submit projects, write Norah Dick, [ndick@glass.org](mailto:ndick@glass.org). Pictured: The new headquarters for the Navajo Tribal Utility Authority in Fort Defiance, Arizona, features traditional building materials complemented by modern, high-performance, aluminum-framed curtain wall, storefront and entrance systems. Tubelite Inc. was the glazing systems manufacturer; Southwest Glass & Glazing the installer.

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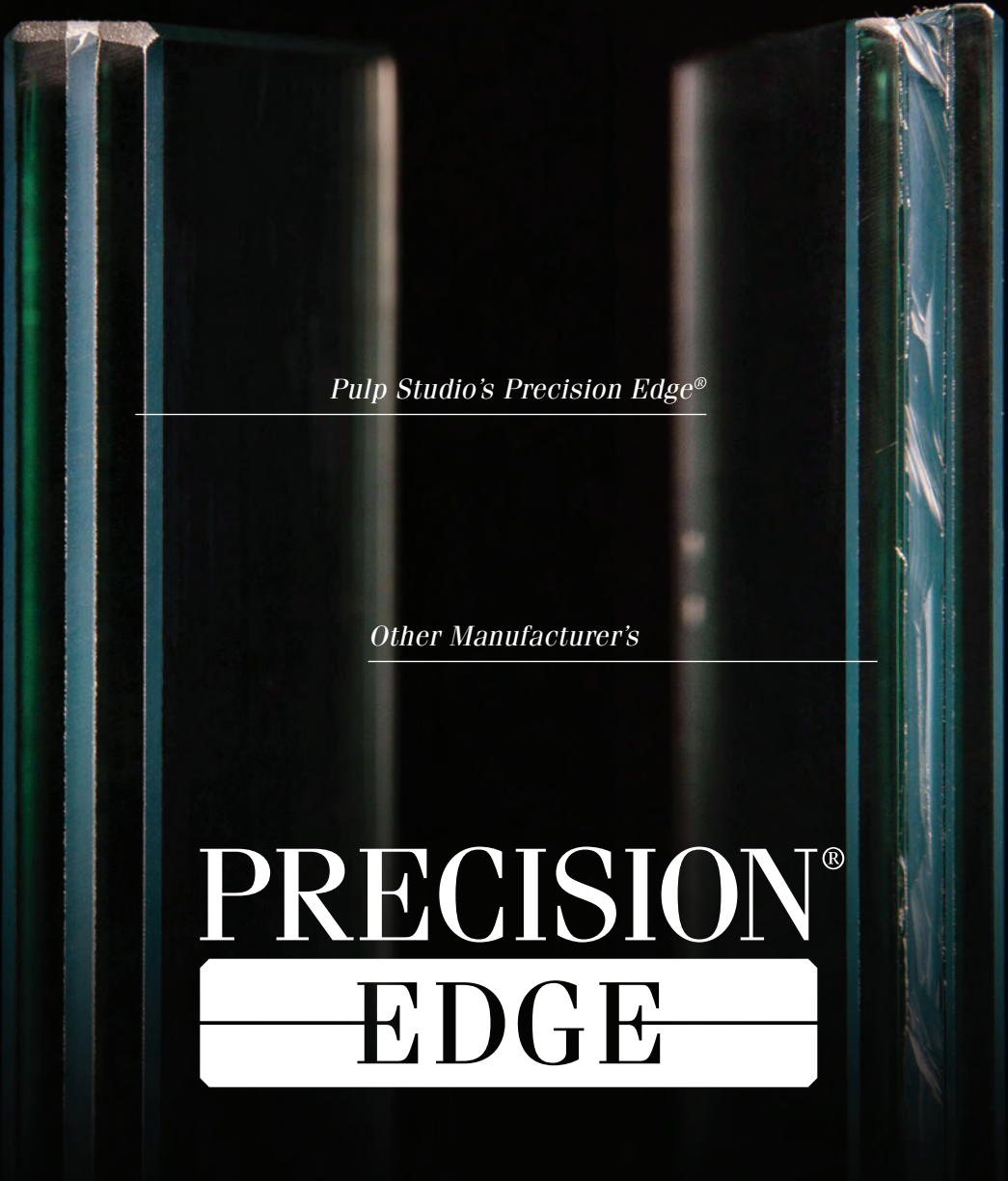
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# Get Ready for Change



**KATY DEVLIN**  
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kdevlin@glass.org

**T**he landscape of the glass business shifted abruptly in the wake of COVID-19. While the industry entered 2020 on strong footing after a decade of expansion, companies today face great uncertainty over the ongoing health crisis, the economy's ability to rebound after record drops in GDP, and even the future of building design and manufacturing processes.

Speakers at the recent NGA Glass Conference, held virtually July 28-30, offered insights about the state of the industry and the "new normal" of businesses' operations, providing some clarity about how decision makers can prepare for what's coming next. Key takeaways:

## 1. THE ECONOMY

Conference keynote speaker Connor Lokar of ITR Economics described the "macroeconomic carnage" happening in the U.S., evidenced by a 32.9 percent nosedive in second-quarter GDP. Lokar doesn't anticipate the macroeconomic recession will go away quickly, nor does he anticipate a V-shape recovery. "This will ripple through the economy through next year sometime," he says.

Construction is a lagging sector. As such, the U.S. economy is a leading indicator for where construction is going. Depending where a company sits in the construction market, it will have varying lead times for when things decline and then start to recover, he said.

## 2. GLASS PRODUCTION

Float glass production, particularly in more mature markets, sharply dropped due to COVID-19, according to Bernard Jean Savaète, president of BJS. Différences. "The impact is severe on operations," Savaète says. "Most of Europe's 48 melting installations had to cease production for several months. Tens of thousands of workers were without jobs. It is estimated that glass production in Europe will be roughly 20 percent below last year. ... I would say that COVID is often accelerating decisions for manufacturers. It is sharpening existing difficulties."

## 3. DESIGN AND CONSTRUCTION

The coronavirus "irreversibly changed how building occupants will enter, navigate and occupy building

interiors," according to Domenic Cristofaro, architecture practice leader for HED Design, who also said that preventing disease transmission will be foremost in the mindset of design professionals, building owners and regulatory agencies. He said he envisions glass will be used more frequently as barriers not only at points of service, but within office spaces themselves. Gone are the days of the over-densification of commercial office buildings, he said.

## 4. MANUFACTURING

Many fabricators are contending with supply chain interruptions, delays in spare part deliveries, and difficulty getting service technicians into facilities to address problems. Tim Zuerlein, director of supply chain, advanced materials at Eastman Chemical Co., said companies must maintain close and ongoing communication with their suppliers about upcoming orders and future needs. "Transparency and trust are paramount. It does no one any good to overstate your requirements—state what are going to be your true requirements," he said.

Marcus Bancroft, sales manager for Vesuvius, also underlined the need to maintain an inventory of critical parts, especially due to disruptions in technical service. "It will save you a lot of money in the long term to invest in the spare parts now," he said.

## 5. DIGITAL TECHNOLOGIES

One of the major impacts of COVID-19 has been an increased use of software and digital tools, as fabricators seek to increase automation and optimization, and as a large part of the workforce shifted to working remotely. Although the pandemic has certainly had major economic impacts, for those that have the option, now is actually a prime time to purchase software, said AJ Piscatelli, business development, FENml. Vendors are currently competing for clients, he says, resulting in better pricing for consumers. If it does end up being a large investment, many suppliers are able to work with payment plans as well.

Read more coverage from the NGA Glass Conference in this issue, including troubleshooting for fabricators on page 12 and a code Q&A on page 24. Additional updates are available at [GlassMagazine.com](http://GlassMagazine.com). ■





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## YOUR ASSOCIATION AT WORK

NEED-TO-KNOW INFORMATION  
FROM THE NGA

### NOTES FROM THE CHAIR PANDEMIC SILVER LININGS: A GLAZIER'S PERSPECTIVE FOR MANAGEMENT

BY CHRIS BOLE



**D**uring these unprecedented times, it's more important than ever to be working on your business, rather than working in it. As the owner of a glass shop and a glazing company, I know that concept has never carried more weight than it does now. And GlassBuild Connect will give all of us the opportunity to do it.

To be honest, I would never have accepted a Zoom meeting as a legitimate meeting six months ago, and now it's my life. While we are all disappointed to not be able to physically attend GlassBuild America in Las Vegas, GlassBuild Connect will still give us the opportunity to connect and advance all of our businesses. All of us should see this as a unique opportunity to involve those on our team that we normally may not be able to send to a traditional in-person GlassBuild America. Providing education to our staff is so critical for knowledge and retention, and GlassBuild Connect provides a very economical (free) way to do this.

For the entire month of September, exhibitors and experts from all over the world will be on one platform to bring you the latest in products, services, news, trends and more. GlassBuild Connect will provide an actionable

roadmap for strengthening your company, including:

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All online, and for the entire month of September. GlassBuild America has never been more accessible or affordable. This is your chance to expose your entire crew to the incredible education and products that comprise GlassBuild Connect.

Let's look at this year as a "glass half full," seize the opportunity to attend GlassBuild Connect online, and look forward to 2021 when hopefully we can all be together again.

Chris Bole is the 2019 - 2020 Chair of the NGA Board of Directors. He is the owner of two glass companies in Colorado Springs, Colo. - Pikes Peak Glass and City Glass Co. Information on GlassBuild Connect registration can be found at [GlassBuild.com](http://GlassBuild.com).

### WHAT IS GLASSBUILD CONNECT?

GlassBuild Connect is a month-long online event for glass and glazing industry education, innovation and interaction, to be held Sept. 1-30. GlassBuild Connect will offer unique industry-focused programming and education content every business day throughout September.

More than 330 industry companies will present new products and services on the site. And NGA's education, technical and advocacy teams will be offering webinar sessions and other learning opportunities every weekday throughout September. Learn more and register for free at [GlassBuild.com](http://GlassBuild.com).





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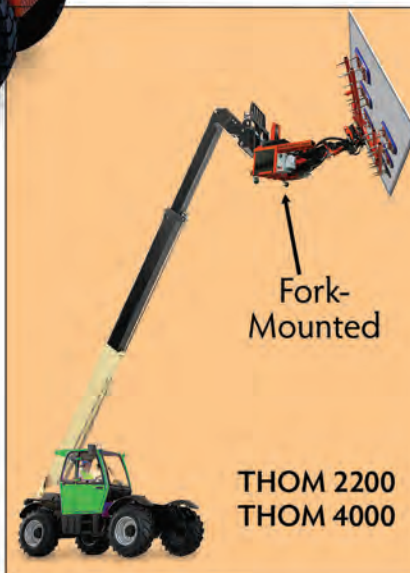
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# THE GLASS ADVOCATE

EDUCATION, ADVOCACY AND TECHNICAL  
CONTENT FROM THE NGA

## Solutions to Fabrication Challenges, from NGA Glass Conference

A panel of the glass fabrication industry's foremost technical experts responded to questions about top fabrication challenges during the National Glass Association's NGA Glass Conference, held July 28-30. The virtual conference drew 500 registrants from all segments of the industry. Panelists included leading glass consultants Chris Barry, Stan Joehlin, Bill Lingnell and Mike Burk.

### Glass Breakage Analysis

Barry offered insights on how to identify the cause of glass breakage. By investigating breakage in the factory or field, he is able to trace the origin of the break and find clues to identify the cause. In one situation, "We had about a quarter of the glass breaking, and it was all breaking at the same dimension. That gave us a clue as to what was going on," he said. Barry discovered the cause of the breakage was overlapping cutting scores. The small overlap created weakness in the glass, leading to thermal stress breakage once the glass was installed. "Stop that score before you hit the score you've previously put there," Barry said.

Barry noted other causes of breakage, such as scratches on the edge of fresh cut glass, scrapes caused by sharp blades used during paint trimming and steel cap scratches on an insulating glass unit.

### Optical distortions

Glass fabricators who produce heat strengthened or tempered glass must understand the scope and cause

of optical distortions, said Joehlin. "Typically, the building owners will complain about it. Architects will try to find fabricators to produce with no distortion. Fabricators will try and achieve it. The only problem is there are laws of physics that stand in the way of that."

To produce stress required for tempering or heat strengthening glass, fabricators must raise the temperature of the glass, which creates a softness of the glass in processing. The softness of glass can open the door to distortion, such as edge kink, roller way and iridescence, he said. Once fabricators understand the causes of varying types of distortion, they can make adjustments to their processes to limit the effects.

### Post-fabrication finishing

Architects continue to seek glass systems that maximize sightlines and minimize metal and hardware. The trend often leads to the use of laminated glass with exposed edges, such as on a glass railing system. Architects, however, also want that exposed edge to meet aesthetic expectations, with smooth edges and precise alignment. Post-fabrication polishing and finishing can create those conditions, but does it increase the chance of breakage?

Post-fabrication finishing processes

do not comply with the current industry standards, Lingnell said. Since the glass is required to be tempered, post polishing "can weaken the glass," he said.

"What can we do? One thing we can do is some physical testing," Lingnell said. He recommends companies evaluate the strength of the glass resulting from the "worst level" of edge grinding. "Find out how much you're going to take off and do some testing," he said. "See what the outcome will be. It will be a go/no go situation."

The NGA has also established a committee to evaluate the issue, Lingnell said.

### IGU gas measurements

Burk presented on gas fill in insulating glass units. New measurement tools allow for easier measurement of gas fill in the plant and on the jobsite, even on IGUs with multiple low-emissivity coatings. "It from inside the building, and measure gas fill in multi-cavity units as well he said.

Burk notes that problems that present in the field can be avoided by making changes in the plant. "All of the panelists pointed to issues that are fabrication issues that show up in the field. This points to making sure fabricators do things properly," he said. ■



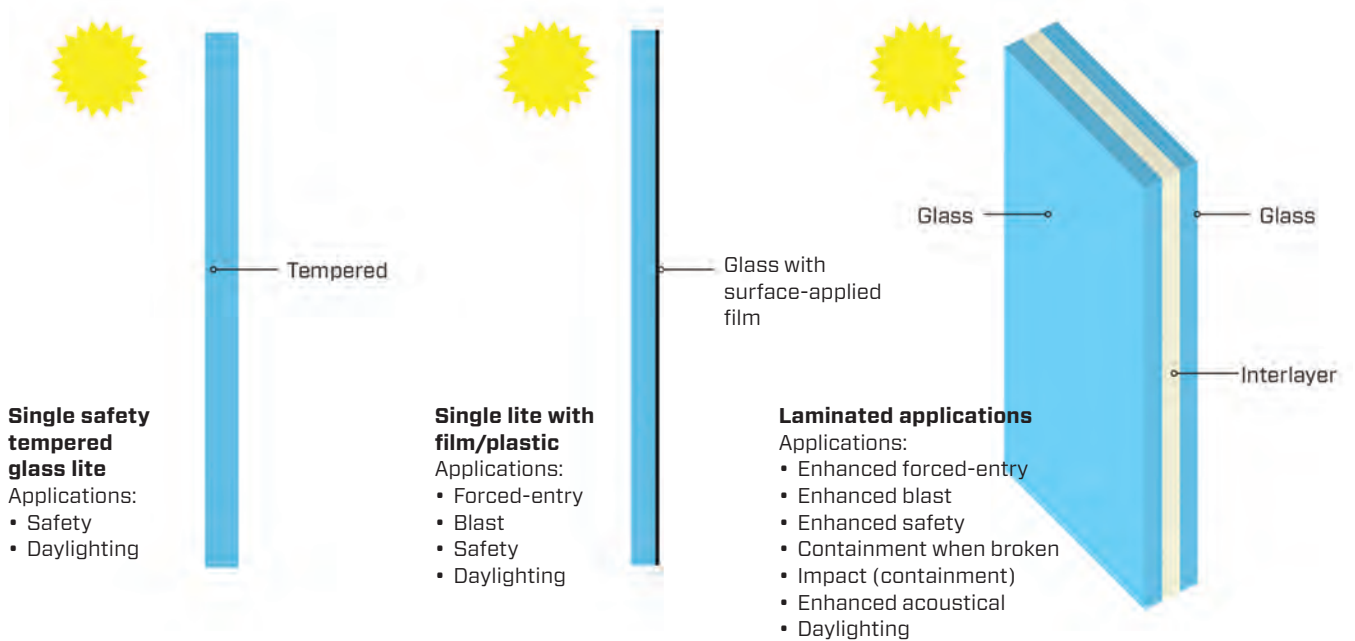
ONLINE

- For additional information about addressing common fabrication challenges, check out the Glass Informational Bulletins and Glass Technical Papers available in the NGA Store at [glass.org](http://glass.org).
- Access complete coverage from the NGA Glass Conference at [GlassMagazine.com](http://GlassMagazine.com).





# GLASS INFORMATIONAL BULLETIN



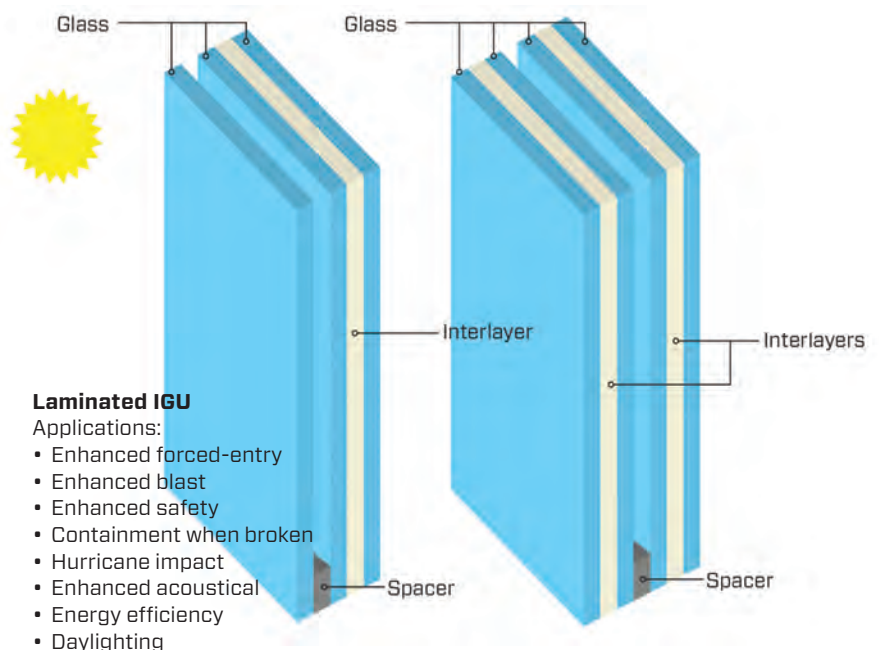
## Security Glazing

Security glazing may be used in windows and doors within schools, commercial, medical, public, worship and other building types. Before the glazing is specified, it is important to determine the assets, threat/hazard, vulnerability and risk associated with the specific building type.

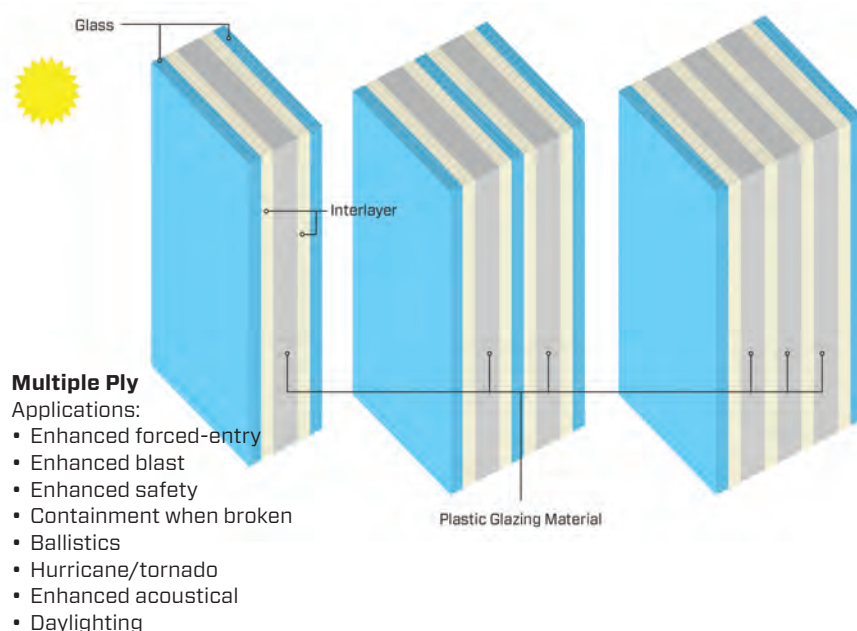
### Types of security glazing

**Burglary-resistant laminated glazing** can be a deterrent to smash-and-grab crimes, and typically consists of two layers of annealed, heat-strengthened or tempered glass bonded together by an interlayer.

**Forced-entry (FE) resistant laminated glazing** can be used in facilities with high risk of attack and may also resist penetration from handheld or hand-thrown



## GLASS INFORMATIONAL BULLETIN—SECURITY GLAZING



objects. It can consist of multiple layers of glass and interlayers, or multiple layers of glass and polycarbonate bonded together by a polyurethane (PU) interlayer.

**Bullet-resistant (BR) laminated glazing** is designed to resist penetration from firearm ammunitions and provide an improved safety barrier against bullets and flying debris. It typically consists of multiple layers of glass, interlayers, resins, and/or plastic materials such as polycarbonate or acrylic. Glass layers are intended to deform projectiles and slow their velocity. Plastic layers are designed to capture the deformed projectile, and interlayers act to hold all layers together through the assault. The layer on the witness side may have abrasion-resistant polycarbonate or PET film for spall protection.

### **Blast-resistant laminated glazing**

can substantially reduce injury from flying glass resulting from direct blast shock waves. When properly designed, framed and anchored, blast-resistant laminates can maintain the integrity of the building envelope following an explosion and reduce interior damage. Typical construction is two layers of glass bonded together by a thicker interlayer. For higher-level blasts, thicker constructions may be needed. The glass can be annealed, heat-strengthened or fully tempered, but must be tested/engineered with the intended glass strength. The glass can be installed into insulating glass units for improved thermal performance. ASTM F2912 and ASTM F1642 can give guidance to specifiers. Blast-resistant laminated glazing may offer some level of burglary or forced-entry resistance, but typically is not bullet-resistant without further

specification of a ballistic threat level.

**Hurricane-resistant laminated glazing** reduces the effects of windstorms on buildings by preserving the integrity of the building following wind-borne debris impact and positive/negative pressure cycling, and preventing glass particle fallout. It typically consists of two layers of glass bonded together by an interlayer. The interlayer thickness is based on the intended use of the glazing in the building and the expected missile size for the elevation of the building. Some hurricane-resistant systems have also been successfully tested for blast resistance. These systems may provide a level of burglary or forced-entry resistance as well, but typically are not bullet-resistant without further specification of a ballistic threat level. Hurricane-resistant laminates are typically tested according to ASTM E1886 with the accompanying specification, ASTM E1996.

### **References**

Full text of this bulletin, written by the NGA Fabricating Committee, and additional references are available at [glass.org/store](http://glass.org/store). References include:

- NGA Glass Technical Papers FB16-07 Bullet Resistant Glazing and FB12-07 Blast Mitigating Glazing
- NGA/PGCI Protective Glazing Manual and NGA Laminated Glazing Reference Manual
- Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings, from the Department of Homeland Security
- All About Glass and Metal: A Guide for Architects & Specifiers, from the NGA and Glass Magazine



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*\*From June 24 to press time Aug. 11. Read these stories, and others, in their entirety at [glassmagazine.com](http://glassmagazine.com).*

## **Guardian Glass Stops Float Production at Luxembourg Facility, Launches New Coater in Poland**

Delano, a Luxembourg-based online publication, reports that Guardian Glass will cease float glass production at its Dudelange, Luxembourg, facility. The company plans to continue laminated glass production, and is in discussions to merge float operations with its facility in Bascharage, according to the report. The motive is reported as officials' belief that industrial glass demand will not return fully for a few years.

Guardian Glass also started full production on a new glass coater at its second facility in Czeszochowa, Poland. The new float line at Czeszochowa is expected to begin operations in September 2020.

The coater uses advanced technology for turning standard float glass into high-performance, value-added glass, say officials. It will enable the plant to expand production of low-emissivity, solar control glass products for residential—Guardian ClimaGuard—and commercial—Guardian SunGuard—applications.

In addition to Guardian's internal events, the company also signed a strategic partnership agreement with ML System S.A., a company in the building-integrated photovoltaics market. Within the framework of this agreement, Guardian Glass will offer a complete range of BIPV product solutions—both semi-transparent and opaque—that help contribute to Nearly Zero Energy Building regulations.

## **Şişecam Group Simplifies Shareholding Structure, Develops Anti-Viral Coating**

Şişecam Group received approval from the Capital Markets Board of Turkey for its plan to simplify its legal entity and shareholding structure. Procedures on consolidating the publicly listed main subsidiaries of the Group—Anadolu Cam, Denizli Cam, Soda Sanayii and



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Trakya Cam along with Paşabahçe Cam—under the umbrella of Şişecam, were initiated on Jan. 30, 2020, and the official application was made to the CMB on April 27, 2020.

Accordingly, following approval by the CMB on July 23, 2020, for the merger of Türkiye Şişe ve Cam Fabrikaları A.Ş. through the acquisition of Anadolu Cam Sanayii A.Ş., Denizli Cam Sanayii ve Ticaret A.Ş., Paşabahçe Cam Sanayii ve Ticaret A.Ş., Soda Sanayii A.Ş. and Trakya Cam Sanayii A.Ş., a decision on the merger transaction will be made during the Extraordinary General Assembly meetings of Şişecam



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and its subsidiaries between Aug. 26 and Aug. 28, 2020, with the agenda focusing specifically on the merger transaction. Subsequent to the General Assembly meetings, the merger process is expected to be completed during September in line with the provisions of the relevant legislation.

In addition to the Group’s internal reorganization, Şişecam also developed a special coating that neutralizes viruses and bacteria on glass surfaces. Şişecam started applying this technology on glassware products through its production capacity.

# Go Back to Normal? Or Forward to Get Ahead?

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## NEWS TO KNOW

### FHC Completes Manufacturing Expansion at its Southern California Headquarters

The Frameless Hardware Co., a supplier and manufacturer to the glass and glazing industries, completed the expansion of its Southern California facilities. The expansion project has effectively doubled the company's footprint, workforce and capacity, allowing for the addition of complete metal fabrication capabilities. Along with significant capital investments in machinery and personnel additions in Q1 and Q2, the company's completed expansion includes in-house engineering, research and development, and testing departments.

The developments come at a time of increased industry demand for domestically sourced products amid supply chain uncertainty resulting from pandemic market impacts, say officials.

### AGMT Glazier Certification Program Now Offering Remote Online Testing

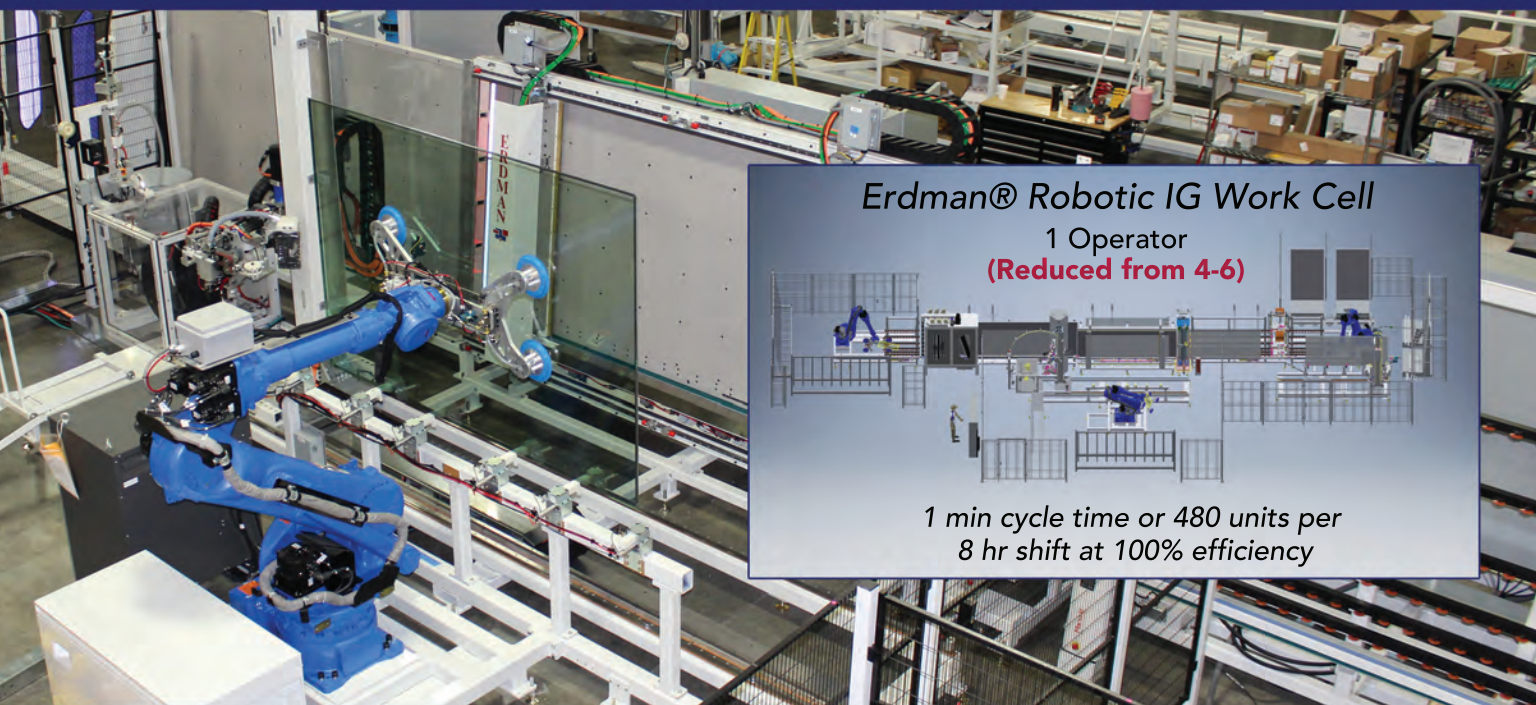
Formerly available only in a classroom setting, the Architectural Glass and Metal Technician Program began offering the written, knowledge-based test for glazier certification through a remote proctoring platform, permitting candidates to complete the test at their convenience from their own home or glazing shop.

AGMT partnered with BTL Surpass Inc., a global testing agency with U.S. operations based in Exton, Pennsylvania, allowing the use of a dual camera technology for administering the exam. Candidates are able to choose a time-slot between 8 a.m. and 8 p.m., six days a week. Once registered, they log onto Surpass at their chosen appointment time and receive the exam with monitoring by Surpass. Surpass personnel utilize screen-sharing, the candidate's computer webcam and mobile device camera to verify security of the entire test delivery. ■

*\*From June 24 to press time Aug. 11. Read these stories, and others, in their entirety at [glassmagazine.com](http://glassmagazine.com).*



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# INSIGHTS

26. CODES AND STANDARDS  
30. PERFORMANCE MATTERS  
34. FACTORY FLOOR

standards tend to offer technical guidance and uniform approaches that allow a diverse set of market participants to operate with a common approach.

## Specifications

Specifications often operate in a gray area between standards and contract. Most are familiar with the term specifications as the contractual requirements and directives for performance. But “standard specifications” also exist. They can be developed in the consensus-based approach or offered by specific industries or manufacturers. Regardless of source, these standard specifications can establish contractual pass/fail criteria touching on materials, tolerances and performance when adopted into agreements. But as creatures of contract, standard specifications can be negotiated.

## Code

Code is somewhat of a catch-all term, but the most important. The importance of code is that while it can include references to standards and specifications, it is the “law.” Official legislative action has specifically adopted particular standards, specifications and models into the binding legal requirements of every project to which they apply. While often subject to modification, the governmental validation and adoption of specific requirements for design, fabrication or installation means that code cannot be avoided by contract and is enforceable by law.

## Enforcement

It is in this question of enforcement and penalties that the true difference between standards, specifications and code appears. Working backward, code sets minimum criteria that must be met, regardless of what the parties’ contract

## LEGAL

# THE LEGAL DIFFERENCE BETWEEN STANDARDS, SPECIFICATIONS AND CODE

BY MATT JOHNSON



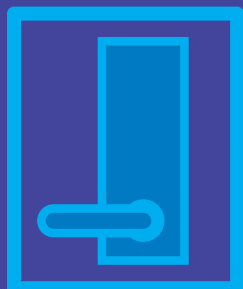
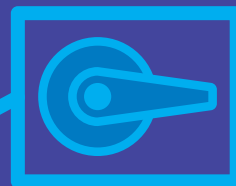
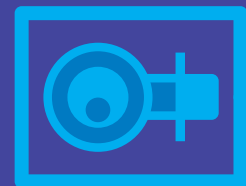
**T**he artistic expression and technical precision in glass systems is found in installations regulated by standards, specifications and code requirements. Understanding the differences between these regulations can help identify where artistic and technical expressions cross into the legal realm.

In normal business scenarios, these terms are often used interchangeably. In the legal realm, however, each is unique and has a different source, obligation and penalty for failure to comply.

## Standards

At the most basic level it can be helpful to visualize standards as agreed-upon “how-to” guides. These guides are often prepared by organizations with an interest in developing broad, consensus-based approaches to particular problems, systems and questions. While not always perfect for every situation, these industry

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says. The failure to meet aspects of code can jeopardize completion of entire projects and their permitting, and even be subject to statutory fines.

As creatures of contract, specifications find both their enforcement and penalties within the project documentation. The failure to meet a specification can be either a major or minor breach of contract, depending on the nature of

the specification and the violation. Equally, the consequences for failing to meet specifications fall into contractual remedies negotiated by the parties.

Standards, unless incorporated into code or contract, are guidelines that can be useful direction for performance of work. Whether a particular failure to meet a standard carries weight tends to focus on the specific violation and

guidance being provided by such standard. On the other hand, where issues of contract are concerned, there is more flexibility regarding equivalent performance and other mitigating circumstances.

### Risk mitigation

Vocabulary lessons aside, the real issue to appreciate is that standards, specifications and codes are separate things. Each has its own source, impact and consequence. The risk mitigation point comes from an appreciation of those differences and where the opportunities to mitigate exposure rest with each.

The most direct opportunity for mitigation comes when negotiating contracts. Keep a specific eye out for referenced and incorporated standards and codes. Ensure full compliance with specifications or standards can be met or negotiate the specific parts that apply. Specifically disclaim responsibility to meet standards/codes that are not referenced or the portions of individual standards where compliance has been negotiated away. And be mindful of opportunities for missing small aspects of technical standards so that there are contractual rights to cure or that a minor breach of a standard does not become a reason to blow up an entire contract.

General opportunities for risk avoidance also lie with education and participation in the groups developing standards and even adoption of those standards into code. Active contribution to the formation and revision of standards and codes provides the chance for meaningful industry input into the specification, standards and codes that can govern work for years to come. ■

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

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# CODE Q&A

NGA Advocacy and Technical team tackles questions on anisotropy, energy codes and more

DURING THE NGA GLASS CONFERENCE, HELD VIRTUALLY JULY 28-30, THE NATIONAL GLASS ASSOCIATION ADVOCACY AND TECHNICAL TEAM RESPONDED TO FREQUENTLY ASKED QUESTIONS ABOUT GLASS PERFORMANCE, NOTABLE CODE UPDATES, BIRD-GLASS REQUIREMENTS AND MORE. BELOW ARE HIGHLIGHTS FROM THE SESSIONS.

## Urmilla Sowell

NGA TECHNICAL AND  
ADVOCACY DIRECTOR



**Q: If anisotropy should not be considered a defect, how can I convince the building owner that the discoloration and non-uniform appearance is acceptable? Are there any standards that measure what is acceptable for anisotropy?**

**A:** There are no existing standards for anisotropy, but ASTM Committee C14 on Glass and Glass Products is working on a new test method that will cover anisotropy. Meanwhile, you can refer to NGA's Glass Technical Paper FB20-o8 (2017) Iridescence in Heat-Treated Architectural Glass for an explanation of the phenomenon of strain pattern and guidelines for glass inspection on the construction site.

**ONLINE:** Visit [glass.org/store](http://glass.org/store) to access the technical paper, which is available for free download. ■

## Tom Culp

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**Q: What is the biggest change to energy codes in 2019?**

**A:** The code changes take the next step in stringency overall: mainly one step lower U-factor across all climate zones. [Solar heat gain coefficient] format is changing to show SHGC for fixed and operable products separately, which does not change the glass, but will encourage people to look at whole product numbers instead of center-of-glass numbers. There are more daylighting controls as well. I included specific details and numbers in my NGA Thirsty Thursday presentation Energy Code Evolutions 2020.

**ONLINE:** View the archived presentation at [glass.org/thirsty-thursday-webinar-series-archives](http://glass.org/thirsty-thursday-webinar-series-archives).

**Q: How do I know whether to follow ASHRAE or IECC for a building project?**

CONTINUED ON PAGE 28

## Nick Resetar

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**Q: In a remodeling project, what square footage of glass must be brought up to the code?**

**A:** Renovations and additions must comply with the current energy code just like new construction for that portion of the building. New glass installed in hazardous locations must meet the current safety glazing standards.

Full window or sash replacement must meet the same prescriptive requirements as new windows, but ASHRAE 90.1 allows up to 25 percent of the window area to be replaced with the same or lower U-value and SHGC. Renovations that add interior panels or storm windows are exempt because of the improved efficiency gained, but ASHRAE 90.1 requires them to be low-E coated.

Glass-only replacements are considered repairs and do not have to meet current energy code requirements, but the replacement must have equal or lower U-factor and SHGC if ASHRAE 90.1 is enforced.

CONTINUED ON PAGE 28

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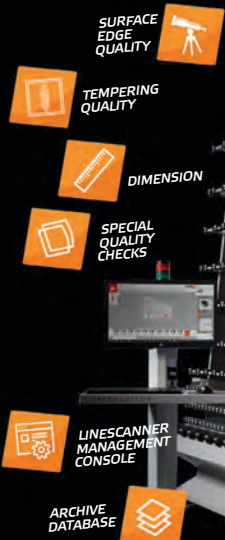
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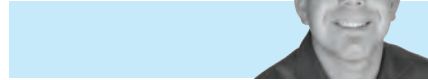


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## INSIGHTS | YOUR PROFITS

### Tom Culp



**A:** The code allows the option to use either one, but you must choose all the requirements from either IECC or ASHRAE 90.1 rather than picking and choosing sections from each. The building owner will decide which code to follow... and their decision will be noted in the specification. While we worked hard to align the commercial fenestration requirements between IECC and ASHRAE 90.1, there are some differences in other parts of the code that could drive the decision.

### Q: ASHRAE 90.1 is looking at thermal bridging requirements. Is that being looked at anywhere else?

**A:** The idea of thermal bridging, that you cannot bypass the insulation, has been discussed in the building science community for many years. From a building codes perspective, Vancouver requires thermal bridging be incorporated in performance modeling, and that all buildings over a certain size must use performance modeling rather than the prescriptive path. California has indicated they want to consider it for their 2022 code update, but likely will delay to the next cycle.

### Q: On laminated glass, which surface location is best for low-emissivity coatings?

**A:** It depends on the purpose. If you embed the low-E coating within the laminate, it reduces the SHGC but you don't get the lower U-factor benefit of low-E coatings. To get both lower SHGC and U-factor from low-E, put it on the outside of the laminate facing the glazing cavity. ■

### Nick Resetar



### Q: In a remodeling project, what square footage of glass must be brought up to the code? (cont.)

**A:** In hazardous locations where accidental human impact could occur, best practice dictates bringing replacement glass up to current safety code standards.

### Q: What qualifies as "translucent glass" when referring to HR919 Bird-Safe Buildings Act?

**A:** The term translucent is not defined in the bill itself, which refers to "opaque, etched, stained, frosted, or translucent glass" as potential acceptable bird-safe solutions. Likely translucent refers to semi-transparent surfaces, in which light can pass through, but objects and shapes are not easily seen. Anything transparent or clear could exacerbate the bird strike problem.

### Q: What are some types of glazing that are available for bird-friendly glazing design?

**A:** Glass products are available with surface treatments such as etch, frit, film and ultraviolet patterns that create visual markers for birds. Muting reflections using angled glass, awnings and overhangs, sunshades and screens are also strategies for reducing bird collisions with buildings. ■

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# DIVIDED BY A COMMON LANGUAGE

BY HELEN SANDERS



It could be said that participants in the façade design and construction community are divided by a common language. These key players—architect, owner, general contractor, glazing subcontractor, consultant, manufacturer and academic—operate in silos, often not seeming to speak the same language when communicating with each other. There is frequently confusion when trying to understand each other’s perspectives.

Peter Weismantle, director of Supertall Building Technology at Adrian Smith + Gordon Gill Architecture and board member of the Façade Tectonics Institute, asserts, “It is always hard to talk the other person’s ‘language,’ but we all need to do our best to walk in the other person’s shoes.” And to walk in their shoes, it is important to understand what every participant really cares about, and what drives their actions.

## The architect

At the risk of over-simplification, the architect’s focus is to bring to life their vision for the building, knowing that the delivered result will be their legacy. “The hardest thing from the architects’ side to get across is that the building will stand for years, decades or even longer. After the heat of the moment passes, we will all be judged by what remains,” says Weismantle.

Architects also must know something about everything in the building—mechanical systems, structural systems, roofing, lighting, façade systems, etc.—since they are responsible for bringing the entire building design together. Some like to say architects are “a mile wide and an inch deep” in terms of building systems knowledge. That typically means it is unlikely for them to have deep expertise in the façade, at least not to the extent of a façade contractor,





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or glass and fenestration fabricator or materials supplier. Typically, they turn to trusted subject matter experts to support them and reach out to those who can effectively connect with their needs. Often, they engage façade consultants, but they too need support on the details from the experts in contract glazing, and glass and fenestration fabrication and material supply.

### The contractor

General contractors focus on budget and schedule, with incentives for saving costs often driving their needs and actions. While the glazing subcontractor cares similarly, they also focus on managing risks associated with installation logistics and quality, fenestration performance and durability, and call-backs. Many glazing contractors agree that project risk is becoming increasingly concentrated with them, being pushed down from the architect and GC through expanded responsibility for design, and up from their warranty responsibilities for façade products and installation.

Communication with the architect is often the cause of much frustration for the subcontractor, and, according to Mic Patterson, ambassador of innovation and collaboration at the Façade Tectonics Institute, “Some façade contractors regard the architect as their enemy.” This drives more adversarial communications, which tend not to deliver win-win outcomes, keeping those contractors away from the table during the design phases, and creating a vicious cycle of poor communication, inadequate façade specification, manufacturability challenges, and compromises on budget and vision.

### The owner/developer

Owners and developers desire a durable, low-maintenance building that meets their needs for indoor environmental quality to attract and retain staff and generate high lease rates. And for developers, cost is always a driver.

“Communication gaps manifest in strange ways, like when the façade contractors sell façade systems as

zero-maintenance systems. To the façade contractor, that means ‘it’s good until it isn’t,’ and then you replace it—i.e. it is not maintainable. To the owner, it means they bought a durable, no-maintenance product,” says Patterson.

### The fabricator

Glass and fenestration fabricators, and material suppliers, of course want their products used in projects; but like glazing contractors, they also want to ensure that the products specified are fit for purpose. For example, will specified products simultaneously meet fire, structural, safety, energy, daylighting, acoustic and aesthetic requirements? And, importantly, is it feasible to manufacture? Often the architect’s vision of acceptable visual quality related to, for example, distortion, pane-to-pane coating uniformity, or anisotropy, is not consistent with manufacturability constraints. Those potential disconnects need to be identified up-front in the specifications to avoid bad outcomes.

Frequently the glazing contractors, and even more so the glass suppliers, are kept at a distance by the architect and general contractor until too late in the design process rather than being recognized as a vital part of the design team, with important subject matter expertise.

According to Matt Kamper, head of contract sales and estimating of Woodbridge Glass/Werner Systems, mechanical, structural and electrical trades are always in the room with the architect early—at the concept stage—but rarely is the glazing contractor invited. The mechanical subcontractors often set the stage for envelope performance and mechanical system design.

At-a-distance or limited communication can lead to inappropriate façade assumptions early in the design process, leading to difficulties in delivering on the design intent, and increasing project costs later in the process, which can also drive value engineering of the glazier’s scope and compromises on the architect’s vision.

### Break down the silos

Recognizing the architect as an important client, not a foe to be fought, is key to success for glazing contractors and fabricators. Taking the time to learn the architect’s vision and the challenges they are facing will help facilitate the dialogue and identify win-win solutions. It will also position those who are successful in building these relationships to gain a much-needed seat at the table in the early concept design phase of projects, creating virtuous cycles of successfully delivered high-performance façades, happy owners, architects and contractors, and repeat business opportunities.

Taking advantage of opportunities to interact and develop relationships with the many players in the community is a key tactic in learning to bridge the communication gap with architects, consultants, owners and general contractors. ■

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Helen Sanders is general manager at Technoform North America and president of the Façade Tectonics Institute. The Façade Tectonics Institute, incubated at the University of Southern California and founded by Mic Patterson and Professor Doug Noble, is actively working to create opportunities for such dialogue across the full breadth of façade design and construction in order to break down siloed thinking and drive innovation in façade design and delivery.

FTI provides a non-promotional platform for knowledge sharing and supports research to address barriers caused by the fragmentation of the building industry. According to Sanders, the glass and glazing community has an opportunity to join the dialogue, to learn how to walk in the shoes of key stakeholders, build lasting relationships across the community and create strategic business growth.



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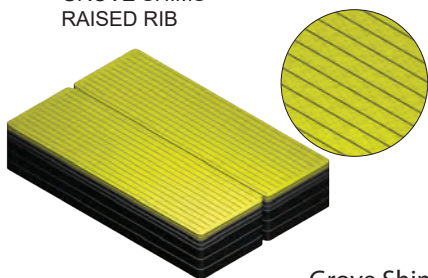
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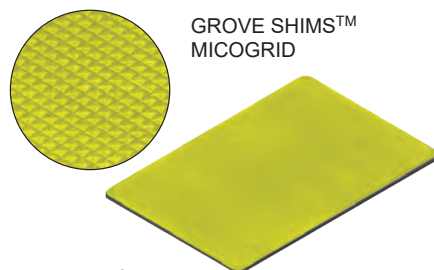
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## RETHINKING EQUIPMENT AND TECHNOLOGY

We're in a new era for manufacturing. What does it mean for glass fabricators?

BY JOE ERB



**Above:** The Forel automated commercial insulating glass line, at Hartung Glass Industries. Photo courtesy of Quanex.

**M**y previous column for Glass Magazine focused on three reasons why commercial glass manufacturers can benefit from adopting new equipment and technology on the plant floor. The column was drafted in March and appeared in April—and in some ways, it feels like that was a lifetime ago.

Since then, our industry and every other have been dramatically reshaped by the ongoing impacts of the COVID-19 pandemic. If you're reading this, chances are your organization was deemed "essential," and you've needed to implement unprecedented safety measures throughout the business in order to minimize the likelihood of viral spread while still delivering on customer demands.

As we approach the fall, with the initial shutdown and economic pause largely behind us but necessary safety precautions still in place, most customers I've spoken with recently have found themselves as busy as ever. Orders are up, and

manufacturers are navigating new operational challenges associated with social distancing and other strict protocols.

All of this got me thinking again about my April column and how we can harness the benefits of modern equipment and technology from a completely different perspective. A few things to consider:

### 1. New safety demands

Safety has always been the top priority for commercial glass manufacturers, and it now comes with a new wrinkle. As we work to minimize the spread of sickness, social distancing measures require workers to remain six feet apart from one another while assembling finished units.

As you may have experienced, this can be something of a challenge—and perhaps one you've been able to solve through the use of automation. A high-speed IG line, for example, eliminates the number of touchpoints needed to assemble a completed unit and can do so with fewer people spread farther apart. Any



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manual process that can be automated helps eliminate touchpoints and different steps required for final assembly, thereby reducing instances where workers need to come into contact with one another.

## 2. The right time to invest

Concerns related to the pandemic might not in themselves be reason enough to make a significant capital expenditure. And of course, we don't yet know what the long-term economic impact will be.

But right now, it doesn't seem likely that we'll revert to the "old" way of operating on plant floors anytime soon. An investment in automation might pay off sooner rather than later, especially given that the pandemic has sharpened some of the labor issues that our industry has been dealing with for a while.

Consider, for example, a worst-case scenario in which one worker in one of your critical areas of production gets sick. Proper protocols will require any workers

who interacted or worked closely with that person to stay home and quarantine for at least a few days. This situation can drag production to a halt, leaving you behind on orders without an immediate fix.

It's important to protect workers from this scenario occurring in the first place by keeping them safe and distant. It's also critical to be able to pick up the slack if you suddenly find yourself lacking manpower. Automated equipment in key parts of your production can be helpful from both perspectives.

## 3. It's time to simplify

Equipment isn't the only area where glass fabricators can eliminate a number of production touchpoints in a plant.

For example, I'm a strong believer in the increasing applicability for vinyl window profiles for all manner of commercial applications. Utilizing high-performance vinyl not only delivers thermal benefits versus the traditional

metal framing once installed, it's easier to work with on the plant floor too. Vinyl welding is a far simpler process involving fewer people than assembling metal frame commercial windows. Additionally, achieving necessary thermal performance with metallic frames today often requires the inclusion of thermal breaks—another step in the production process that can be eliminated with a vinyl framing option.

Today we find ourselves facing some unprecedented challenges, and those challenges come with an opportunity to rethink some of our own short- and long-term success strategies. For commercial manufacturers that want to stay ahead, investigating the benefits that can be realized with modern equipment and technology should be a part of that thought process. ■

Joe Erb is commercial sales specialist for Quanex Building Products.

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The pandemic has, undoubtedly, changed the way that many companies do business. One of the results has been an uptick in the integration of software and digital tools into company processes, as a way to aid remote work, or streamline work processes with onsite staff who must socially distance for safety.

While many in the glass industry, particularly manufacturers, had started digitizing processes well before the pandemic, clients still have some misconceptions about what software can and can't do, say software developers.

Dave Miller, business development, glass fabrication, North America at FeneTech, says he sees customers who underestimate the work involved in implementing software in their business. "Many people underestimate the efforts involved in

implementing a new system, as well as the benefits that can be received. The overall goal of putting a new system in place is to be able to do more with less. However, to get there, we need to ramp up our efforts to make that change. In order to realize these benefits, we need to invest the time in learning how to use the new system to get the most out of it," he says.

Josh Rudd, sales executive at A+W Software, says that there can be some resistance to changing successful, non-digital processes that have historically made the company profitable. "I think the number one [misconception] is a mentality of 'this is how we've done it, and we've been successful,'" he says.

Resistance is understandable, Rudd says, since the skills of those experienced in manufacturing cannot simply be replaced by a software

process. "You might also get division managers ... [who say] 'I've been doing it like this for 25 years, I'm faster than any computers.' For some systems and some processes, they might be right; there's a lot to that," he says.

For installers, the question of digitizing software is more recent, and slightly more complicated. Jeff Sample, director of strategic accounts at eSub software, a construction software firm, says some resistance to digitizing software may be due to unsuccessful early iterations which tried to translate the processes of the factory to the jobsite. "We tried to take ERP outside into the field 10 years ago," he says. "All that [installers have] seen from [developers] is more paperwork. It gave them more requirements to produce more data, which meant an extra hour of paperwork in the

morning, and then another hour or two of giving information at the end of the day."

While industry leaders emphasize how today's software offers a variety of options for maximizing efficiency, they also underline that a software investment requires companies to consider what is needed from digital tools. They recommend companies partner with their software vendor to realize the implementation in their business.

Additionally, they note that the new "software as a service" model, in which services are licensed on a subscription basis, means lower initial investment for companies, and allows for the ability to change providers if the business is not happy with the technology. "Cutting and running is something you can do," says Sample. "One of the most critical things you can do is just make a decision to do it."

# ing



A GLASS INDUSTRY  
GUIDE TO ADOPTING  
NEW SOFTWARE  
AND DIGITAL  
TECHNOLOGIES, FOR  
MANUFACTURERS AND  
CONTRACTORS

BY NORAH DICK

# up



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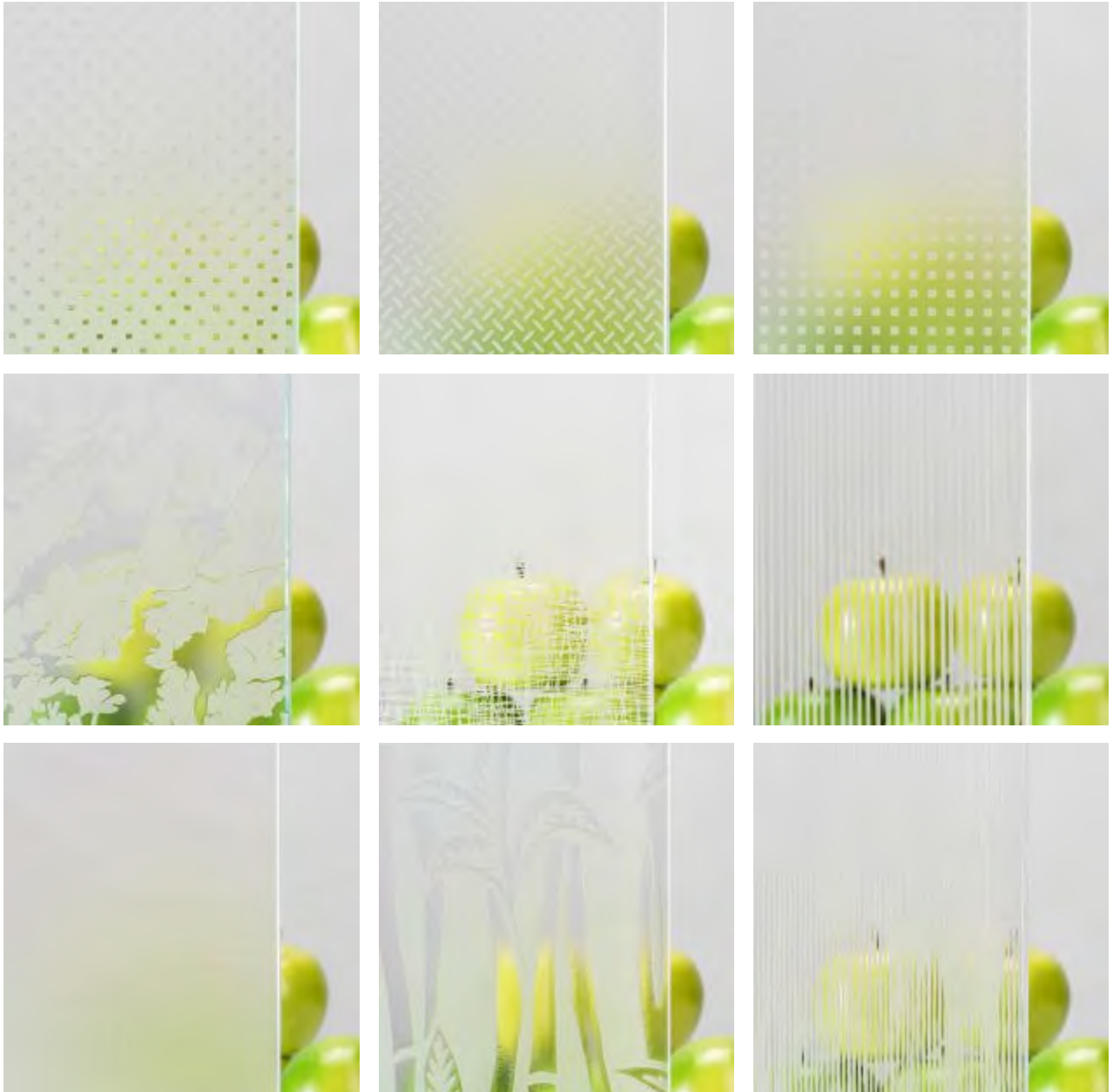


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# getting start

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## TIPS FOR MANUFACTURERS

In selecting a software, suppliers say the first step for company leaders is not reviewing options from software companies, but reviewing their own businesses. Suppliers recommended analyzing and making visible what a company's processes actually are in order to understand how software can streamline or replace those systems.

FeneTech refers to this process as the "investigation phase" of a partnership. "What people find during the investigation phase is that they need to understand their businesses a little bit better. That's one of the positive side effects [of this process]—people do dissect their businesses a bit and determine what processes make sense and which ones can be improved," says Miller.

A+W's Rudd similarly recommends performing an analysis of the business so that company leaders can get perspective on how software could potentially be useful and how they

can start to form goals around the uses for the new tools. "A lot of times, unfortunately, there [are] things they're so used to seeing [that] they don't understand that efficiency can be enhanced in this particular way. They need to understand what their productivity metrics are, what their measure of success is, and what they're trying to achieve," he says.

Rowan Hick, co-CEO of Soft Tech, describes this process as a "gap analysis," and involves companies "[cataloguing] what systems and information/data you have at hand, what these can be used for, what is missing," to better understand how digitization can bridge that gap. "Having your homework done before you talk to an industry partner will help immensely," he says.

Investigation is a two-way street, says Miller, both for the glass company and the software supplier. "The company needs to investigate what is available to them from a software supplier and machine supplier. And the software supplier needs to learn and understand that particular company's business," he says.

After mapping out the business, the company has the information needed to bring to potential software suppliers, say industry sources.

Tyson Oldroyd, vice president of products at Kimzey Software Solutions Inc., makers of GlassTrax software, recommends scheduling online demonstrations with at least two to three software suppliers that seem like they may be a good fit. "Be up-front about your budget and goal for a timeframe of implementation. This way, the software company has a deadline to meet your expectations," he says.

Rudd similarly recommends shopping around. "It's easy to find me on the web, and set up a web demonstration, and one with one of our competitors, and another competitor, and an equipment manufacturer," he says. These introductions and demonstrations should cost little to no money, he says.

Once a company chooses a provider, they should make a plan for implementation. Rudd says he recommends a phased approach, especially for companies that may not be able to completely digitize the

factory floor all at once. "There are definitely companies that can buy everything front to back, but for a lot of businesses it makes sense to phase that down, and again that ties in with them understanding where their business is, and what they're trying to achieve," he says.

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## TIPS FOR INSTALLERS

Just as with software for the factory floor, the first step of selecting a software for the jobsite is mapping out a company's processes, says Jeff Sample, director of strategic accounts, eSub software. This helps to create priorities in what the company needs from the software.

"When you map it, there are must-haves—part of your process that are your special sauce," he says. "Some [software company] will be able to accommodate that. Other things might be nice-haves."

Sample recommends starting this process by forming a committee inside the company



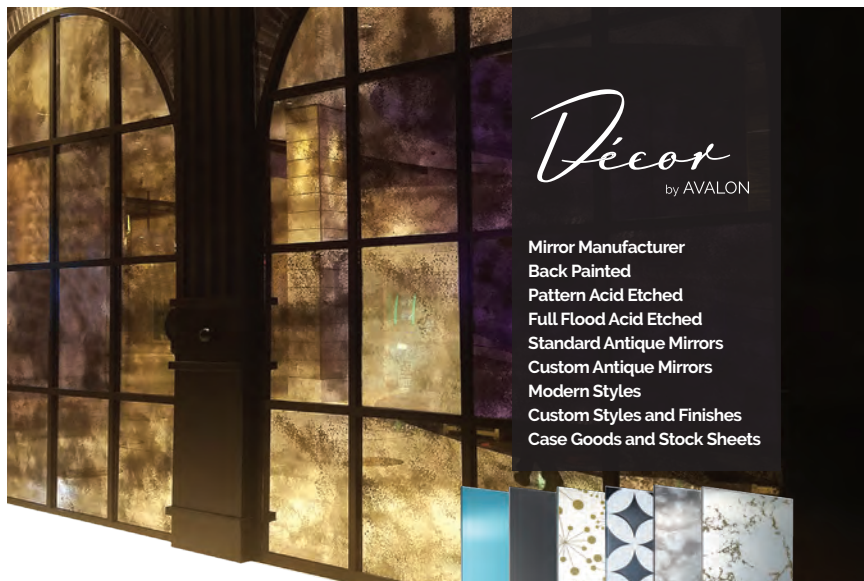
# ted

dedicated to evaluating the new technology. "You need a representation of everybody, including the people that hate it. Most of them hate it because they realize it doesn't fit their process and what they're [currently] doing," he says.

Once a company has set its priorities, it can approach software companies, says Sample. He says starting small, with a pilot project focused on a more minor, but important, process is helpful for software integration, and for minimizing risk and disruption. "Always pilot [an implementation], because failure has to be an option," he says.

Mark Benhard, director of corporate communications for Faro, says establishing a partnership with the software provider is also key. "They must collaborate with solution vendors and get consulting based on their targets," he says.

Testing out different tools to see which fits best is also a good practice, says Benhard, and companies can take advantage of things like 30-day free trials, depending on the tool.



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# training

## TIPS FOR MANUFACTURERS

Training is essential when implementing new software, whether piecemeal or all at once, say developers. “If you receive poor training, you’ll never be satisfied with the new software,” says Kimzey’s Oldroyd. “Training is absolutely critical.”

Oldroyd recommends making one person on staff the go-to resource for the new software. “In the office, assign an employee to be your head of implementation,” he says. “That person makes the new software their priority and learns it inside and out. That way if any employees have a question, they can go to the head of implementation there locally before reaching out to the software provider.”

Miller recommends small-group trainings either in person or over Zoom. Many of the developers interviewed offer

their own trainings or training platforms.

Time for training needs to be taken into account before the software goes live and should ideally happen over a large enough time span that employees can digest the information. “When you take the whole project scope into consideration—that’s a lot of information to digest, so we try to break that down into phases and give people the opportunity to learn chunks of information along the way to build up to complete knowledge of the system before they go live with it,” says Miller.

Staggered training can also be an advantage of a phased implementation approach, says Rudd. “Get people functional learning [on] one particular piece [of software], whether that is in the office or on the shop floor, and then as you phase in different components of the ERP over time,” he says.

Oldroyd recommends making the training realistic to

the employee’s actual work by using real-world customer data. “This means that during training on the new software, you’re seeing your own customers, their addresses, pricing, etc. It allows you to double-check the data conversion, if the software provider offered data conversion. Things tend to stick better when people are using their own customers, products, pricing, etc. during training,” he says.

## TIPS FOR INSTALLERS

One main reason that many construction companies have resisted the use of software tools in the field is a mistaken belief that field workers won’t be able to use it, says Sample. However, most workers today are familiar and comfortable with newer technologies, he says.

“If you walk up to a 50-year-old foreman and ask to see

photos of his kids or his fishing trip, he’ll take out his smartphone. There’s a misconception that this group is not smart enough. We’re talking about people who build buildings and risk their lives. They’re smart enough,” he says.

Although most workers have greater fluency with digital technologies, complete training on new jobsite software tools before implementation is essential. Many software companies offer trainings and online training platforms, including sessions for potential clients. “It can be quite worthwhile to invest in a training session before the actual tool is purchased. Such a training helps clients to see the tools in live action on a dedicated project and answers all the detailed workflow questions up-front,” says Benhard.

Trainings should be made mandatory. Benhard warns that some users may be resistant and will “just want to ramp up with the tool but don’t want to read the user manual.”



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# return on investment



## TIPS FOR MANUFACTURERS

A major question that all companies have, especially during this economic climate, is when they can see a return on investment. For software, it's not as simple a calculation as for other equipment, say developers.

"A machine is designed for a specific process, so it's easier to narrow down what your costs are for one process, and to project what your costs will be when you put the machine on the factory floor," says Miller. "There's no single answer

to how you calculate ROI for software.

This is dependent on all processes related to order fulfillment and the overall time and material savings related to better production and information flow."

Suppliers say software will affect the bottom line for the better in a variety of ways. Rudd underscores the potential for lean manufacturing by implementing software. New digital tools might provide "something as simple as increasing throughput by x percentage and reducing office labor," he says. "[By implementing software processes] you can quote just as

many jobs, using four instead of six people."

Software systems are also more accurate, says Rudd, which reduces costly errors. "The cost in our industry of a mistake is exponential, way more than the material that you broke," he says. "You have all the material costs to do again, the labor costs to do again, plus the opportunity costs of office people working with that reissue."

Beyond decreasing the bottom line, digitization also offers "soft benefits" that aren't available at the beginning of implementation, says Miller, particularly in terms of streamlining

processes. "A good example is tracking the status of an order. If you do not have a good production system in place, when a customer calls to find out the status of an order, a service rep will have to contact the supervisor, who then has to find out what the order status is, and that can take time," he says. "If you have a production tracking system, the rep can look the order up directly, and have it at their fingertips—or you can give the customer their own login, and they can look it up themselves," saving not only time, but also effort.

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## TIPS FOR INSTALLERS

Measuring return on investment differs for every tool and is often a matter of comparing the increased accuracy that the tools provide with original processes, says Benhard.

“For example, with construction verification, when you identify that your concrete foundation is out of level but you already have created the building on it because it was detected too late, then the ROI for a solution to identify the issue earlier is given on the first project to use it instead of rework, which can cost millions.

The same applies for digital design. When a subcontractor can simulate the building in the PC up-front on construction, they can identify and correct errors with very low costs before it is executed and must be reworked.”

Sample says that determining ROI can be a “murky world,” since it depends on the tool itself, and what the company’s goal is. “A lot of [software] companies will come to you and tell you they can get you ROI in a short period of time,” he says. This may be possible if digitizing a “niche space,” like time cards, says Sample, but the return is likely going to be less immediate for larger, more complex projects. “If you’re

talking about digitizing entire sections of what you’re doing, the ROI is longer,” he says.

He recommends that company leaders think about ROE, or return on effort, which measures not just the financial outcome of an investment, but the human effort involved in implementing a change. Sample cites Walker Lockhard, customer service manager for Dado, a construction software firm, for this concept. Lockhard describes ROE as a measure of how effective or efficient work is for employees, rather than its effect on the company’s bottom line.

“For personas ranging from the payroll specialist in the office to the foreman in the field,

the metric of focus should be ROE or Return on Effort,” wrote Lockhard in a blog post. “When change doesn’t contribute to increasing output in a way that is user-friendly, we condition users to associate pain with technology.”

To avoid that pain, which he calls “tech friction,” Lockhard recommends making clear what problems companies want tech to solve before implementing a solution, as applying a solution prematurely can cause more issues, and more work, for those using the tech.

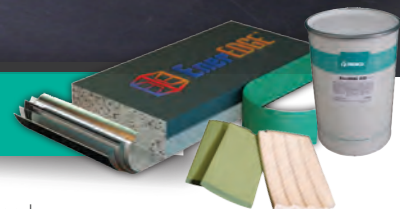
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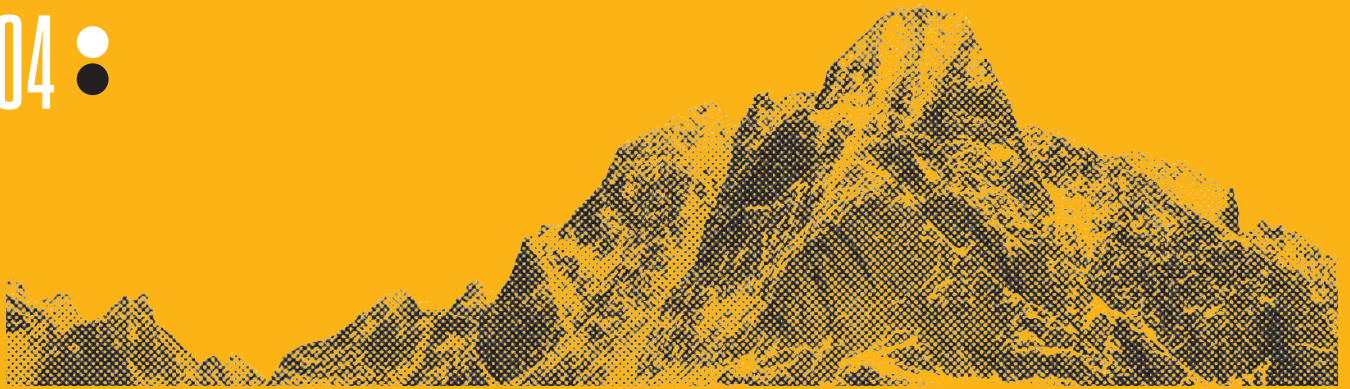
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# long-term goals

## TIPS FOR MANUFACTURERS

While phasing in software and processes gradually can work for a company, it's important to have long-term plans from the outset, with the understanding that the technology will constantly evolve. "Don't plan for today, plan for the next five to 10 years," said AJ Piscitelli, business development for FENml at FeneTech, during the July NGA Glass Conference. "[The software] will soon become outdated."

Oldroyd recommends having a year-long implementation plan. "Within six months, you should feel comfortable in every aspect of the software

that you've implemented. Within the first year, you'll want to implement other portions of the software. Within one year, you should be using 100 percent of what the software provides that you are interested in using," he says.

Looking ahead, Soft Tech's Hick suggests including data tracking as part of an implementation plan, as it is a major trend in software's capabilities.

"Collecting and tracking big data is where the industry is heading, so setting infrastructure goals and creating internal processes to allow for this will create a central platform for secure access and easy collaboration," he says. "Collecting data from the factory floor, tracking actual processing times and materials

management, for example, will result in better inventory and stock control measures. We're starting to see this with the advancement in technology heading toward Industry 5.0."

## TIPS FOR INSTALLERS

Sample says creating longer-term goals is also key to implementing a software plan. "I think they need to have a plan and goal, six months, a year, three years—take an agile mindset to it. If you don't set goals, you don't know why you're pushing forward," he says. "But know that those goals need to change. You have to be ready that those

goals will change over time, based on what's the biggest problem at the moment."

Sample recommends creating a "cadence" of implementation, a steady plan to introduce software gradually. He warns against focusing too much on any one part of the process, but rather staggering upgrades for different departments. Because software implementation itself may change company processes, companies should know that longer-term implementations may make initial changes outmoded, says Sample. "There's a progression, but [companies are] going to eventually have to be ready to pick the next thing, which might include a software process from before." ■





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# DURING — CRISIS

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BY NORAH DICK  
AND  
KATY DEVLIN

Since its inception, the prestigious Glass Magazine Awards program has provided an opportunity to recognize the best and brightest innovations in glass industry products and projects. In many ways, this year's special recognition program offers the same opportunity, as it highlights how the industry innovated in order to meet, and surpass, the demands and dangers created by the COVID-19 pandemic.

Based on the almost 200 submissions received for the program, innovation has not stopped in the months since the pandemic reached the U.S. Glass companies have swiftly and efficiently regrouped to serve the new needs of communities across the country.

In the wake of significant health and economic challenges, industry leaders found a silver lining in their communities' ability to adapt and change in crisis. "The lives of people all around the world have changed radically as COVID-19 traveled the globe only months ago," says Jeremy Nolan, director of business development, Morse Industries. "With such profound loss, we have seen communities come together to fight the continued spread any way possible."

This year's special program showcases the depth and breadth of the glass industry's contribution to communities during the pandemic. It recognizes products and projects, focusing this year on those that helped safeguard communities and essential workplaces. It spotlights businesses that invested in employee safety, as well as those that used lean manufacturing to mitigate labor force and safety issues on the factory floor. And it highlights companies that adapted to the new normal by providing essential education and/or product information to the industry through online communication channels.

Learn more about the industry's Innovation During Crisis in a special presentation at GlassBuild Connect, a month-long glass industry event hosted at GlassBuild.com. And check out a photo gallery of innovations from all companies highlighted in the following program at GlassMagazine.com.



**Left:** Pei Cobb Freed & Partners Architects managed the 2018 construction of the David H. Koch Center, a hospital in New York City, which became an epicenter for the COVID-19 pandemic. Photos copyright Albert Vecerka/ ESTO.

**Right:** C.R. Laurence created “an elegant barrier solution” for The Strand House, a restaurant that is part of the Zisli Group, a luxury hospitality group in Manhattan Beach, California. “We limited hardware inclusion for minimal visual obstructions in freestanding portable barriers with a stainless steel center post and two pivoting panels each,” says Barbara Haaksma, senior vice president, marketing for C.R. Laurence.



## ESSENTIAL PROJECTS

Glass industry companies remained essential in many ways in recent months, but especially in their ability to ensure the safety of the most essential workplace during the pandemic: hospitals.

In 2018 Pei Cobb Freed & Partners Architects completed the David H. Koch Center, part of New York-Presbyterian Hospital in New York City, which became an epicenter of the pandemic. Glass played a major role in the firm’s design, says Emma Cobb, senior

editor, with the purpose of increasing natural light to aid in patient comfort. The design allowed for light in areas of the hospital that are typically cut off, such as circulation, waiting and transfusion areas, she says.

Additional hospital improvements came in response to the pandemic. For example, Gamco Corp. provided Montefiore New Rochelle Hospital, located in New Rochelle, New York, with a new custom-fabricated Emergency Department entrance, constructed after

the onset of COVID-19. “Gamco was able to provide high-end architectural products to finish this critical undertaking as quickly and efficiently as possible in order to protect both patients and health care providers within the Montefiore hospital,” says Bailey Schroeder, executive assistant at Gamco Corp.

## INNOVATIVE SAFETY PRODUCTS

Glass companies provided a range of protective products as the pandemic spread, especially glass barriers and easy-to-clean glass coatings.

### GLASS BARRIERS

Binswanger Glass fabricated intubation boxes for front-line health care workers dealing directly with the pandemic. The box creates a barrier between the intubated patient and the health care worker.





Similarly, Oldcastle BuildingEnvelope created a modular physical barrier, SecureOne Test, “a four-sided, positive-pressure, easy-to-clean modular product with integrated glove ports,” which allows medical professionals to interact with patients while lowering risk of contamination. “With clear glass and an integrated no-draft two-way speaker, it enables clear communication between the health care worker and patient without compromising safety,” says Liz Scruggs, communications

and public relations manager at the company.

Officials from Innovative Glass Corp. and Unicel Architectural Corp. say their privacy glass products—LC Privacy Glass, and Vision Control door units, respectively—offer hospitals hygienic interior architectural barriers. Research shows that privacy glass is a more hygienic option than curtains, being touchless, according to Innovative Glass Corp. officials, and the barriers aid in patient care during the pandemic. “This technology allows [hospital

personnel] to decrease their use of personal protective equipment by 30 percent, partly by reducing the need for extending the IV lines to patients from the corridor and allowing for maintained physical distancing while providing proper patient monitoring and operational savings,” says Viviane Chan, director of sales and marketing at Unicel.

Morse Industries provided custom barrier solutions for a variety of businesses. “There is no cookie cutter solution, as every person, business

and facility face different challenges in combating the virus,” says Jeremy Nolan, director of business development. “The Morse family is prepared to design a customized system to meet the needs of any space.”

Gamco Corp. and Tempco Glass collaborated to develop Invisiguard, a glass partition system that uses low-iron glass for maximum clarity and visible light transmittance. The companies also donated glass partitions to other workplaces, including local small businesses and



**Left:** GGI implemented several new measures to ensure employee safety during the pandemic. The company provided masks to those employees that had to report to the office, and took their temperature daily.

**Right:** Unicel Architectural Corp. supplied hospitals with its Vision Control door units. The integrated, cord-free louvers allow for patient privacy and controlled observation by clinical staff, says Viviane Chan, director of sales and marketing at Unicel.



community centers. “The safety of our local retail and workspaces, as well as their financial ability to continue, are our primary concerns,” says Gamco’s Schroeder.

Though not a traditional glass barrier, Winco Windows’ Transira window solution, which features a vertical shade encased in an insulating glass unit, also helps to minimize allergens and contaminants that can cling to shade fabric, and provides a touchless alternative to traditional drapes. Katherine Hahn, marketing coordinator at Winco Windows, emphasizes the importance of the

technology for essential workplaces, such as hospitals, for safety as well as occupant comfort: “The window system can be locally controlled and simultaneously tied into the overall building management system. This allows health care workers and patients to control visibility, light and solar heat entering a room at the touch of a button,” she says.

C.R. Laurence Co. introduced five new glass barrier products to meet the needs of customers, says Barbara Haaksma, senior vice president, marketing for C.R. Laurence. The hardware and barrier solutions are “tailored

to meet the evolving design and safety needs of restaurant, retail, workplace, medical, education and transportation environments,” she says.

Fulbright Glass Boards, Dillmeier Glass and Synergy Glass Door also provided glass partitions; Tyrolit Vincent Srl tools were used to fabricate in-demand glass partitions.

#### GLASS COATINGS

As companies used glass to create safer spaces, industry experts also worked to make glass itself safer by developing and deploying a range of glass coatings.

Pilkington North America developed Pilkington Sani-Tise, “a transparent virucidal and bactericidal glass technology.” The pyrolytic titanium-dioxide based coating is activated by UV exposure and “uses photocatalytic properties to inactivate viruses and bacteria that are on the glass surface,” says Kayla Natividad, architectural technical services engineer, Pilkington North America.

Unelko Corp. offered several of its surface treatments for the cleaning of glass, including its Invisible Shield glass coatings and Sani-Shield glass cleaners



and surface wipes, the latter of which can be used to clean and protect glass against contaminants. GGI also offered glass barriers with its new Enhance glass surface protection, a hydrophobic and oleophobic—repelling water and oil, respectively—solution allowing the glass to remain cleaner between disinfections, says Stephen Balik, principal director of architectural sales and marketing, GGI.

Peerless Products Inc. introduced an anti-microbial powder coat finish to the architectural market, which the company used to rein-

force its window and door frames. The finish's additive ingredient is an inorganic silver agent; while the finish does not eliminate COVID-19, it does work on bacteria such as E. coli, staph, mold, mildew, algae and fungus, says Sarah Lero, marketing manager, Peerless Products.

### INVESTING IN EMPLOYEES

In the wake of COVID-19, industry leaders instituted various changes to support employees, improve worker safety and aid local

communities.

"The onset of the COVID-19 pandemic tested our resolve, and impacted the communities we live in and our way of life," says Liz Scruggs, Oldcastle BuildingEnvelope communications manager. To face the challenges, OBE "immediately enacted a plan to ensure the safety of its more than 6,500 employees," Scruggs says. OBE suspended travel and face-to-face meetings; it incorporated hands-free applications for hourly workers to clock in; and it utilized its SecureOne Screen across all glass manufacturing plants to pre-screen

employees with relevant COVID-19 exposure questions and temperature checks.

OBE also assembled a team of leaders focused on an internal business continuity plan to address both short- and long-term issues that could surface from the pandemic. "The business continuity team quickly learned employees and managers needed resources to understand the new virus," says Scruggs. "They provided communications via email, frequently asked questions and posters to help employees learn about the coronavirus that leads to COVID-19,





**Left:** COVID-19 required new safety measures for the workplace and jobsite, including the creation of the Pandemic Safety Officer in Pennsylvania. District Council 21/Glaziers Local 252 worked with the Finishing Trades Institute of the Mid-Atlantic Region's Health and Safety department to create a new training program in order to comply with the new rule, says Stephanie Staub, marketing director at the Architectural Glass Institute.

**Right:** YKK AP focused on assuring safe work environments by implementing "new normal" protocols including social distancing and expanded sanitizing measures, establishing temperature screenings at manufacturing locations and encouraging the use of masks.



as well as how to protect themselves, each other and our customers."

Companies altered work environments to promote safety. For example, GGI configured office spaces to support social distancing for the employees who have returned to work and to provide a protective shield between each worker. Magnetic glass marker board style partitions produced by GGI are utilized on three sides of each cubicle, providing each team member a more functional—and fun—protective shield, according to company officials. In addition, many

GGI employees continue to work remotely to allow for social distancing in the office.

Tempco Glass "installed InvisiGuard partitions at all locations to protect the counter sales team and customers," says Diana Chang, customer relations. "We also introduced curbside pickups by appointment only in order to reduce contact." The company also distributed, and continues to provide, employees with necessary PPE weekly, including surgical grade masks, latex gloves and face shields.

In addition to supporting employees' health, several companies also took steps to

support workers financially. In May, YKK AP and its sister company YKK (USA) Inc. made corporate donations to double operating dollars available in the Employee Assistance Fund shared by the companies, which offers grants to employees facing unexpected financial hardships. "Despite economic uncertainty, YKK AP approved a company-wide wage increase in July. While many companies are cutting wages and jobs, YKK AP realized it couldn't overcome challenges successfully without the commitment of its employees," says Oliver

Stepe, president. "Since day one YKK AP has had to reinvent itself daily to navigate this crisis with safety at the forefront to ensure the long-term success of its customers, employees and communities in which it serves."

Companies also looked beyond their companies to work to provide assistance to their local communities. "Business units and individuals were not only committed to keeping the supply chain going, but also using their time, talents and resources to help those in need," says Erin Johnson, director of marketing, Quanex Building



Products. Groups at Quanex in both the U.S. and the UK produced face shields for frontline workers, and employees at various plants provided local support by organizing blood drives, donating PPE and even taking out ads to congratulate graduating seniors.

"One of the greatest overall accomplishments was the support provided to 40 local charities in 'Quanex hometowns' across the U.S. in the way of donations and through communications programs designed to drive more traffic to the charity sites," says Johnson. In

conjunction with the Quanex Foundation, Quanex donated \$500,000 to charities in its hometowns, with individual donations ranging from \$7,500 to \$15,000.

## MANUFACTURING AND MANAGEMENT

Faced with everything from supply chain disruptions to sudden jobsite closures, glass company leaders looked to new technologies and process adjustments to successfully meet the changing needs of the market.

"As we have come to realize

over the last four months, project sites, vendor supplies, various directives—both local and state government—dictated quick changes," says Hillary Hulteen, CEO, Lafayette Metal and Glass. "[This] required Lafayette to be nimble and anticipate next steps in order to mitigate the various complexities in maintaining project schedules and ensuring project completion."

### AT THE PLANT

Due to supply chain concerns, Lafayette Metal and Glass increased in-house production. "We brought all necessary production

in-house, due to vendor closures—metal production specifically—to ensure we were in the best position possible to deploy materials to maintain project schedules," says Hulteen.

Within production and office areas, companies also looked to ensure a safer and healthier manufacturing environment. This included the adoption of more automated technologies. Industry equipment suppliers noted demand for existing advanced automation solutions that limit touches and allow for fewer employees working a line.



## “WHEN YOU CAN PUT YOURSELF IN THE SHOES OF ANOTHER HUMAN BEING, LETTING THEM KNOW WE ARE HAVING A HARD TIME TOO, IT BRINGS PEOPLE TOGETHER.”

Adelio Lattuada launched the Cyberal project to automate activities and increase production flexibility. The project includes robotic solutions that require only one operator, according to company officials.

Salem Flat Glass & Mirror provides automation and robotic solutions for CNC lines, edgers, insulating glass lines, lamination lines and more. “These innovative systems provide social distancing options for your facility and reduce downtime, maximizing your production while keeping your employees safe,” says Ben Ward, automation integration engineer.

“While safety and ergonomics for operators has always been our top priority in developing equipment, the COVID-19 outbreak has inspired us to think outside the box,” says Jessica Metz, marketing manager for Erdman Automation Corp. The company offers the Erdman One Operator U-Shaped IG Line, which, as the name suggests, was designed to only require one operator. The company continues to develop the line “that would utilize two application stations and drop the cycle time to 30-35 seconds, for a 25 percent increase in

throughput. This will allow for maximum social distancing, safety, and IG output with only one operator,” she says.

### PROJECT MANAGEMENT

Companies also addressed order and project management processes. They adopted new technologies and procedures, and increased communication among project team members.

For example, to meet challenges of social distanced communication with customers, companies offer solutions to complete sales and orders without in-person, face-to-face interaction. A+W Software’s iQuote responds to those needs for glass and fenestration manufacturers, says Christopher Kammer, marketing coordinator, manager. “The A+W iQuote system has multiple features that, when all turned on, will allow your customers, salespeople, and even internal order-entry employees to configure and automate quotes, place orders, generate documentation and communicate status all in real time,” he says. “As the world reopens, the new work-from-home environment could stick around for the foreseeable future. A+W iQuote serves you and your

customers to embrace this trend by allowing you to maintain social-distancing requirements and hands-free communication all while still meeting your sales goals.”

Lafayette Metal and Glass looked to its proprietary project management tool to maintain quick response times, company officials say. “We utilized our project management software to access accurate, real-time data to assist Lafayette’s project team in order to respond to and communicate any schedule and supply concerns as a result of various issues from COVID, including vendor delays, to all major stakeholders,” says Hulteen. “For example, our procurement team was in constant contact with each and every vendor who supplied product to Lafayette and continued to update our project management software with real-time information that was able to be accessed by all Lafayette partner employees remotely for quick and transparent client communication.”

The communication with vendors allowed Lafayette officials to understand their situations and capabilities, support their necessary cash-

flow, and ensure accounts were kept current, they say.

### ESSENTIAL COMMUNICATION

Though COVID-19 slowed the industry and prevented many companies from conducting business in-person, the flow of information did not stop, as businesses quickly pivoted to using virtual and online communication tools to distribute information for employees and clients.

### EDUCATION AND TRAINING

The onset of this public health crisis proved a steep learning curve for all companies, as businesses quickly adapted to a completely different working environment. For most, this transformed environment came with new workplace safety requirements.

Companies in Pennsylvania were tasked with creating a new role, the Pandemic Safety Officer. In order to ensure compliance and provide training relevant to glaziers, District Council 21/Glaziers Local 252 partnered with the Finishing Trades Institute of the Mid-Atlantic Region’s Health and Safety department to create a new training program, says Stephanie



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THE 2020  
GLASS  
MAGAZINE  
AWARDS  
SPECIAL  
RECOGNITION  
PROGRAM

Staub, marketing director at the Architectural Glass Institute.

Steve Metzger, manager of the DC 21 Health & Safety department, created the “COVID19 Awareness Program” with a curriculum targeted toward glaziers. “Attention focused on compliance and communication among glaziers, other trades and the general contractor, as well as what to do in instances when others, including the general contractor, do not comply with COVID-19 protocols,” says Staub.

District Council 21 partnered with the Architectural Glass & Metal Association to implement the safety training. “AGMA contractors wanted to continue operations without putting their employees in a vulnerable position of possibly getting sick, and the FTI program provided both glaziers and contractors peace of mind this could be accomplished,” says Staub.

FeneTech also pivoted after the onset of COVID-19, cancelling their FeneTech User Conference, and switching to a virtual conference for the first time in the event’s 18-year history. Organizers aimed to make the event,

which hosted over 200 FeneTech users across the world, as useful as possible for clients. “Why not use this time to prepare a return to normal armed with an arsenal of tools to make production even better than before?” says Ron Cowl, president and CEO, FeneTech.

In addition to disrupting education of current glass industry employees, the pandemic also disrupted training for future glass industry employees. Pilkington North America recognized that many students had summer internships cancelled due to the crisis, and leadership worked to mitigate this fall-out. “We developed a six-week virtual education program designed to help grow technical and professional knowledge of the engineering and glass manufacturing world as well as provide some skills to help prepare for success in the workforce,” says Kayla Natividad, architectural technical services engineer, Pilkington North America.

#### **SALES AND INFORMATION CAMPAIGNS**

Many glass industry workers were deemed essential during the pandemic, providing essential products to keep

workers safe, or building services for critical infrastructure. As glass industry work kept going, companies were tasked with finding new, entirely online methods of communicating to project partners—from suppliers to clients.

Syndi Sim, vice president, marketing and business development at Diamon-Fusion International, says the company had to balance the customers’ need for information with the effects of the pandemic. “We wanted to be mindful of our customers’ circumstances, while doing our best to provide additional marketing and sales support,” she says. The team created targeted sales sheets, social media and email campaigns, as well as industry ads to show the hygienic benefits of DFI’s products. DFI communications were sensitive to what customers needed, and honest about where the company was as well. “When you can put yourself in the shoes of another human being, letting them know we are having a hard time too, it brings people together,” says Sim.

Innovative Glass Corp. and A+W Software similarly created campaigns for the company’s products, prod-

ucts which had the potential to be useful in mitigating the impacts of the pandemic.

Innovative Glass Corp. featured videos on its social media and online platforms, communicating with the health care sector regarding its smart glass technologies, LC Privacy Glass and CoolVu Transitional Window Film, says Susan Kane, design and marketing manager.

Meanwhile, A+W Software showcased its iQuote software to clients; it has the benefits of being hands-free and automated, offering streamlining for the COVID-19 workplace. The company emailed glass businesses, breaking down the benefits of the product and providing testimonials from current users. “The purpose of the campaign was to educate our readers on options available to them when it comes to interacting with customers and prospects during this time of societal change,” says Christopher Kammer, marketing coordinator, A+W Software. ■

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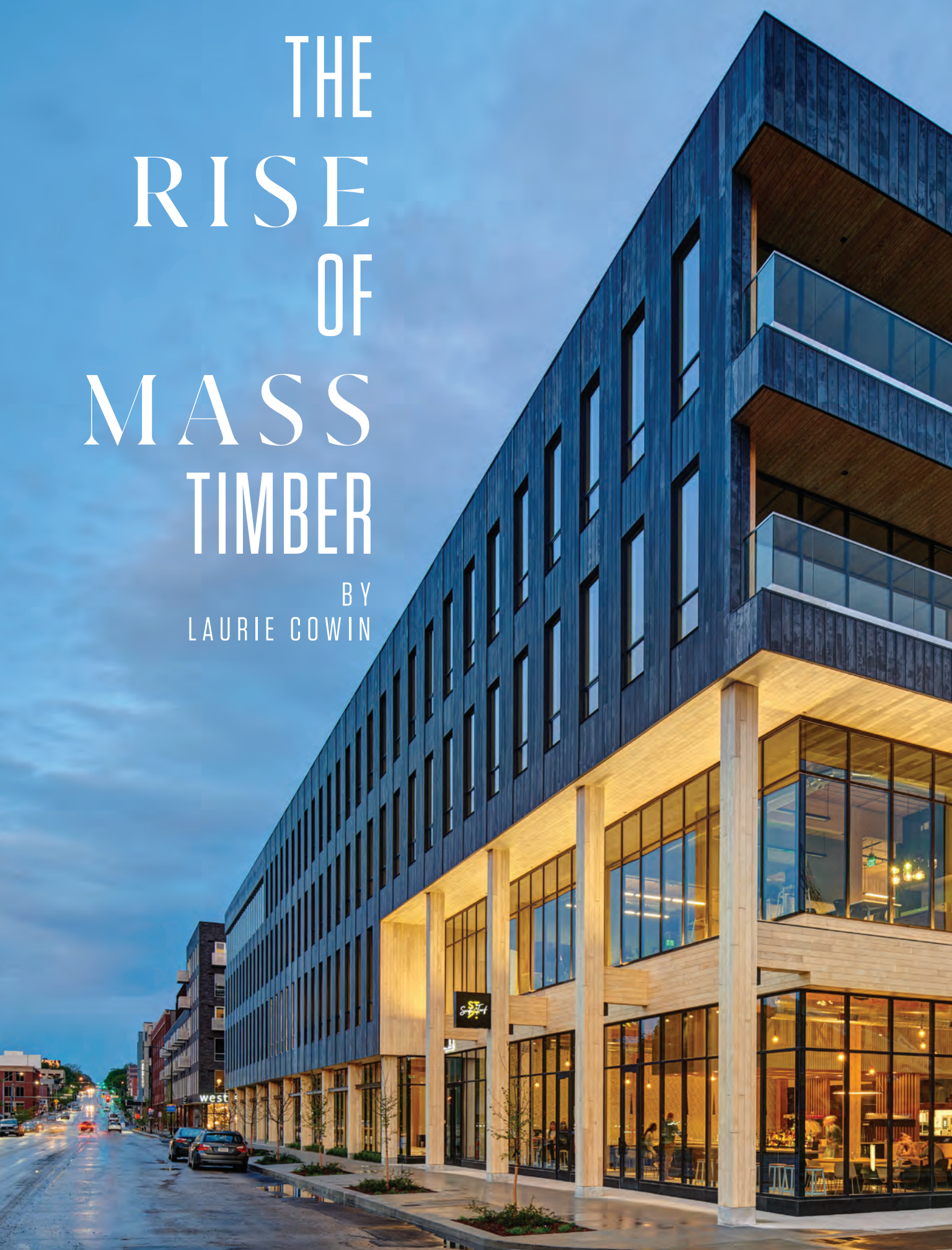
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# THE RISE OF MASS TIMBER

BY  
LAURIE COWIN







THE 2021 BUILDING CODE IS SET TO ALLOW MASS TIMBER BUILDINGS UP TO 18 STORIES HIGH. WHAT ARE THE FIRE, SEISMIC AND STRUCTURAL PERFORMANCE CONSIDERATIONS?



T

The 2021 International Building Code will include provisions that permit the construction of tall mass timber buildings up to 18 stories—a notable increase from the previously allowed maximum height of six stories. The move reflects a trend in the U.S. building market as it takes greater note of mass timber as a viable option for tall buildings, an already widely accepted building method in Europe and Canada.

Mass timber includes any product permitted for use in Type IV construction, which, according to the American Wood Council, encompasses building products such as cross-laminated timber, known as CLT, dowel-laminated timber (DLT), structural composite lumber, glued-laminated timber and large section sawn lumber.

The material has several inherent benefits, according to industry sources. One is its light weight—it is about 92 percent lighter than steel and 80 percent lighter than concrete, which can have “huge impacts” on the foundation design, says Nick Milestone, director of mass timber at Katterra. The product also emits less carbon during manufacturing and creates an airtight detail, thereby reducing the building’s lifetime energy costs, says Milestone.





Mass timber is relatively new to the U.S., says Milestone, who has worked in the mass timber market in the United Kingdom since 2005 and has traveled the world, including Singapore and countries throughout Australasia, to help those governments push for mass timber development and solutions. “The U.S. is in its infancy but has put a very strategic prescriptive roadmap together to allow for the adoption of mass timber. Because of the adoption of the materials and new building code changes that will allow the progressive build of mass

timber, it will only take five years for the U.S. to catch up with the rest of the world,” he predicts.

This up-and-coming construction method is important to be aware of for all building industry companies, including those in the glass and glazing industry, sources say. However, it doesn’t necessarily alter glazing methods, they say.

#### **The path to codify**

This building code development is years in the making. Shiling Pei,

associate professor, civil engineering, Colorado School of Mines, explains the progression of material codes to design codes, then to the International Building Code for the actual application.

When the American Wood Council approached the International Code Council with a request to form an ad hoc committee to study tall wood buildings, the ICC was particularly concerned about two questions. One: would wood structurally support a tall building? And two: if a fire breaks out, would it lose its structural supporting capability?





**Previous spread:** 111 East Grand is a spec office building in downtown Des Moines, Iowa, a 4-story mass timber structure (Type IIIA), with retail at the first level and three levels of commercial space above. The structural gravity system consists of DLT panels over glulam post and beam substructure. The lateral system comprises a precast concrete core and walls. The project is a



collaborative development between JSC Properties, Rypma Properties, Christensen Development and Ryan Companies.

StructureCraft was engaged as a design-build partner and was responsible for structural engineering of the timber superstructure, including development of design documents. During the construction phase, StructureCraft was responsible for final design, fabrication, procurement and erection of the timber structure. They collaborated with Raker Rhodes Engineering, who was the EOR for the foundations/concrete structure. Photo credit: StructureCraft

**This spread:** The six-story Soto office building is San Antonio's first mass timber project, with five stories of timber structure over a concrete podium. DLT panels are used for the exposed floor

and roof decks, supported by a glulam post and beam substructure. StructureCraft joined Lake Flato and Boka Powell early in concept design as the structural engineer of record. The brick façade presented a challenge as timber is more sensitive to deflection than steel and concrete. In response, StructureCraft engineered and tested custom steel outriggers that tie back to and are hidden within the timber frame. The design also features a two-way flying cantilevered roof.

Champion Glass glazed the office building, with Byrne Construction as the general contractor. The project required special steel anchor clips from Champion Glass's systems to the wood beams; all of the anchoring was fully engineered the same as a steel or concrete building, says Champion Glass's David Luna. In total, they installed

8,400 square feet of Oldcastle BuildingEnvelope Series 6000, 14,500 square feet of OBE ICR225 and 16,500 square feet of OBE reliance wall. Glazing is Guardian Glass SNX62/27. "I can see [mass timber] being used more frequently," says Luna. "It is environmentally friendly. Most buildings emit carbon into the air, whereas this type of wood structure removes carbon from the air." Photo credit: StructureCraft



The Ad Hoc Committee on Tall Wood Buildings, formed in 2016, was tasked with answering those questions. They studied materials from the wood, concrete and steel industries about the strength supporting ability of wood and its fire-resistance and concluded they just didn't know enough about it, explains Thom Zaremba, partner at Roetzel & Andress and code consultant for the NGA and GICC.

Although generally cost-prohibitive and therefore quite unusual, says Zaremba, industry dollars supported the building of a full-scale, two-story apartment mock-up made entirely of cross-laminated timber. Then they burned it down.

"They learned some very important things," he says. "There were no

collapses, no structural failures and the fire was contained within compartments." When CLT is set on fire, the exterior layer burns and completely covers the inner core of the timber in char. "Once it chars, it no longer burns. Char is not flammable and you can't ignite it, so it basically puts the fire out," explains Zaremba.

This test yielded clear data about how thick CLT must be to achieve 20-minute, 30-minute, 1-hour, 2-hour and 3-hour fire-resistance ratings. It also allowed professionals to look at how thick the CLT is and calculate how much structural support is still virgin unburned wood. "That tells them how thick the CLTs need to be on the first, second, all the way up to the 18th story, to continue supporting it even if they get

burnt and charred," Zaremba says.

With the new information in hand, the ad hoc committee submitted dozens of proposals, which the ICC reviewed and adopted to ultimately include in its 2021 version of the International Building Code. It will permit structures to be built up to 18 stories tall using only wood structural support.

Because most fire truck ladders don't extend beyond about nine stories, the code will require stories nine through 12 be partially protected with gypsum board—typically on the interior only—and mass timber elements from 13 to 18 stories be fully protected with gypsum board.

#### **Seismic testing**

Fire resistance was a leading concern, but not the only performance





## THE ART OF THE WOOD CURTAIN WALL

Timber is also making its mark on the façade. “Wood curtain walls have risen in popularity in recent years because of more competitive pricing, manufacturing process improvements, consumer awareness, and an overall shift toward design aesthetics that incorporates wood,” says Greg Header, president, Solar Innovations Architectural Glazing Systems. “Customers are always skeptical at first, but as wood curtain walls become more mainstream and they start to see the final projects, they begin

**Solar Innovations manufactured this wood curtain wall in Church Creek, Maryland, at the Harriet Tubman Visitors Center. With a Douglas Fir interior and an AAMA 2605 Bronze Duracron paint exterior, this unit fits in with both the interior and exterior of the building. The span of the wood curtain wall in this project is approximately 660 square feet.**

to jump on board. Some projects are designed up to five years out, so it takes time for those projects to come to fruition.”

Spans and supports are two important considerations with wood curtain walls. “Keeping a span of wood curtain wall under 24 feet is important to reduce structural concerns,” he explains. “Using a structural horizontal member at the midpoint allows you to use much finer, lighter material compared to what would be used for full-height framing. This design will also

make the project much more affordable.”

Using proper finishes and sealers to ensure the wood can withstand moisture is also important. Solar Innovations recommends using an aluminum-clad exterior finish when the curtain wall is exposed to the elements. Header says, “When installing, it’s best to cover a wood curtain wall or seal it so it’s not exposed to a moist environment.”

Aesthetic considerations are often driven by what wood is locally available. “Mahogany, white oak, Douglas fir, southern yellow pine, or other pine species are popular choices,” says Header. It’s also common to integrate aluminum and wood components into the system.

Header anticipates the market will continue its growth and advises buying from a reputable supplier, with years of project experience, whose products have undergone certified testing. He also recommends installers be well-informed about the product, perhaps even visiting the factory to learn more, and appointing a non-working supervisor. “If you’re well informed, it’s worth the extra investment in time and money because you’re going to have a better product and develop a niche that you can be a leader in,” he says. “I think there will be glaziers that gravitate toward this and want to learn more because it is a skill and an art.”





consideration under testing. A seismic shake table test of a 10-story, full-scale mass timber building aims to support the development of a seismic resilient lateral system for tall wood buildings, explained Keri Ryan, associate professor, civil engineering, University of Nevada Reno, during an FGIA webinar earlier this year.

Pei, also a member of the project team behind the shake table test, explains part of what makes this test unique is the industry collaboration to make everything as realistic as possible to what is likely to be designed and built after the IBC code takes effect. For example, all columns and beams will be built to fire code ratings, per the IBC code, despite not burning it, because beam size affects connection points.

The shake table itself is a 40- by 25-foot platform connected to hydraulic actuators that can replicate a specific ground motion, including horizontal, vertical and rotational motions.

“From the two-story test we did about two years ago, we’re pretty confident the structural system will remain damage-free,” Pei says. “But what we haven’t tested before and what typically is not tested that much in these large-scale shake table tests is nonstructural performance. The bottom line for this entire project is resilient space for seismic design.”

Ryan emphasized one of the

**Opposite, left to right:**

The 12-story Framework Building in Portland, Oregon, is a mixed-use building designed to show off mass timber as much as possible, says Jonathan Heppner, director of projects, Lever Architecture. Although currently on hold because of financial difficulties, the project was fully permitted and passed tests for fire,

acoustics and structural resistance. The primary skin is an aluminum composite metal with fiberglass windows, and a curtain wall up the building displays the wood. "To the greatest extent possible we want to expose the wood so people can benefit from a warm environment," he says. "The goal for the use of mass timber, especially

because it affects sub-contractors, is to design the building in a way they can use as much as possible existing construction systems out there in a way that can bring innovation to unexpected places." Photo credit: project^ and LEVER Architecture

Fire tests resulted in minimal damage to the

two-story mass timber apartment mock-up. The test helped establish guidelines for how thick CLT must be to achieve 20-minute, 30-minute, 1-hour, 2-hour and 3-hour fire resistance ratings.

important notions of resiliency is the ability of a building to quickly recover its function after an earthquake. The team specifically identified the building envelope as a priority nonstructural component because of the importance of the building envelope to safety and function. In fact, it is among the most vulnerable nonstructural components because it's distributed vertically floor to floor and must accommodate inter-story drifts and accelerations, says Ryan.

Components to be tested include storefront curtain walls, including stick-built curtain wall and unitized curtain wall, and light-framed with windows, including light-gauge steel stud framing and wood stud framing.

The resulting test data, Pei explains, can quantify the performance of nonstructural components as they relate to functional recovery and resilience objectives. "We can try different designs in different parts of the buildings and stories and see what works and what doesn't and get the subsequent research and development," he says.

**Prefabrication**

Among the most significant advantages of mass timber, Pei says, is the prefabrication aspect of it, which can reduce costs and improve quality.

"In many cases CLT are made to marry exacting specifications at the factory," explains Zaremba. "They're delivered

to the site and put together like a jigsaw puzzle, which reduces the time necessary, labor necessary and cost of putting these buildings up."

Its prefabricated nature also can reduce construction waste and can save 30 to 40 percent on construction build times, Kattera's Milestone says.

Kattera offers mass timber as both a prefabricated, where the prefabricated parts are assembled onsite, and modular product, where parts are delivered to the site as modules and craned into place, dependent on the logistics of the actual build site, says Chester Weir, design lead in the office of the chief architect. "There's a calculus involved between offsite modular manufacturing and onsite assembly, depending on the distance and logistics involved going from factory to site," he explains.

**Opportunities for glazing**

Mass timber also provides an aesthetic appeal, which often translates to opportunities for more glazing, sources say. Glass gives the views outside when you're in the building, but also exposes the wood structure inside of the building, says Zaremba. "More use of glass in the envelope, especially on the lower levels, is very likely," he says.

Pei agrees, predicting more mass timber will be on the horizon, which is "good news" for the glass and window industry as whoever is building the

structure likely will want to expose the wood. Although the up-front cost can be more expensive, Pei anticipates if production volume keeps increasing it could be on par with current construction methods. "Studies show it's cost competitive," he says.

**Finding the right material**

"[Mass timber] has introduced a very significant competitor to concrete and steel," says Zaremba. "Overall, fairly looking at all of the available options, it can be a very smart building choice."

Further, Milestone and Weir anticipate the marriage of mass timber with steel and concrete for buildings, dictated by what the end user's ultimate goal is. Weir cites Kattera's integrated team as thinking holistically about buildings and opening their minds to hybrid approaches where building components are combined to facilitate timelines or allow certain materials to be used in ways that best play to their strengths.

Milestone says, "We're looking at hybrid solutions where we're putting the right material in the right place so our clients have more informed decisions on cost versus carbon in what they're looking to achieve, whether it's visual, biophilic or reducing the building's energy cost in years to come." ■

# PRODUCTS

01



03



02



## Bonus Product Coverage

Don't miss the bonus product coverage now online as part of GlassBuild Connect. If you haven't registered already, sign up for free at [GlassBuild.com](http://GlassBuild.com) to see more than 600 products. Access to the site will only be available through December 31, 2020, so act now!



### 01. Glass partition

Gamco Corp. introduced the InvisiGuard Glass Partition System. The partition system uses tempered high-quality, low-iron content glass for higher clarity and transparency. In addition, the glass surfaces are treated with a hydrophobic coating, making it easy to clean and resistant to streaks, stains, smudges, dust and water spots. Both sides of the glass barrier are water- and soil-repellent.

718/359-8833 | [GAMCOCORP.COM](http://GAMCOCORP.COM)

### 02. Glass partition

OmniDecor introduced Convivium, a glass partition comprising a large crystal glass sheet, with a range of available decorative detailing, supported by a lighting structure mounted on wheels. The finishing on its edges can be either lacquered or have metallic tones, such as champagne or titanium. Convivium can also include a source of battery-powered lighting; when used outdoors, this light can illuminate a path. The product can also be stacked horizontally.

+{39}0858-0711-18 | [OMNIDECOR.IT/EN](http://OMNIDECOR.IT/EN)

### 03. Decorative glass

Pulp Studio introduced the Vetríte Collection. Pulp Studio is partnering with the Italian SICIS Factory to create a curated collection of large format decorative glass. With sizes measuring up to 47 ¼ inches by 110 inches, Vetríte is ideal for contract and hospitality settings, say of-ficials. Its durable, scratch-proof surface does not require waterproofing. Upon request, further customization and treatment for hydrophilic and photocatalytic properties will enhance the surface to become self-cleaning and antibacterial.

310/815-4999 | [PULPSTUDIO.COM](http://PULPSTUDIO.COM)



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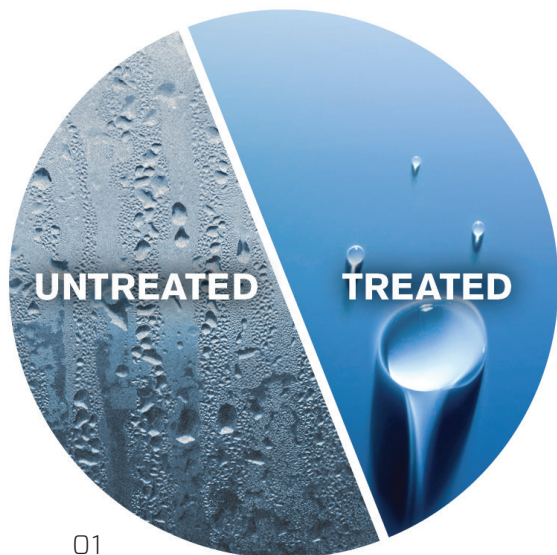


IG Systems

Software

Window Systems

*Intercept* is a registered trademark owned by Vitro.



01



03



02

### 01. Antimicrobial coatings

Unelko Corp. offers its Invisible Shield Protective Glass Coatings to provide an effective “antimicrobial” solution for glass manufacturers and fabricators to protect glass with a water, soil, stain and bio-film resistant finish that reduces surface contamination and preserves glass. Unelko also offers its REPEL and Sani-Shield Antimicrobial cleaning/coating solutions that clean, shield and protect glass with an antimicrobial barrier that resists the growth of odor-causing bacteria, mold, mildew, contaminants and microbes.

800/528-3149 | [UNELKO.COM](http://UNELKO.COM) | [GLASSCAREEXPERTS.COM](http://GLASSCAREEXPERTS.COM)

### 02. Fire-resistant glass

Safti First offers new, larger sizes for its fire-resistive glazing products. SuperLite II-XLB 60 passed ASTM E-119/UL 263/ULC S101 testing and is listed by Underwriters Laboratories with a maximum clear view area of 10,000 square inches—125-inch maximum clear view width or height—in both fully captured and butt-glazed wall applications. SuperLite II-XLB 120, also with butt-glazed wall capabilities, has a maximum clear view area of 7,980 square inches—133-inch clear view height or width.

888/653-3333 | [SAFTI.COM](http://SAFTI.COM)

### 03. Impact system

Sentech Architectural Systems completed the development and successful testing of a new impact-resistant structural glass system, VetraFin. Using the latest glass technology and 28-foot-tall glass panels and fins, the system was specifically designed for high-end building entrances constructed in hurricane-prone, urban areas. Using 18-inch-deep glass fins, the system provides a solution that has no visible exterior metal components, maximizing transparency while ensuring structural integrity and strength.

512/266-7045 | [SENTECHAS.COM](http://SENTECHAS.COM)

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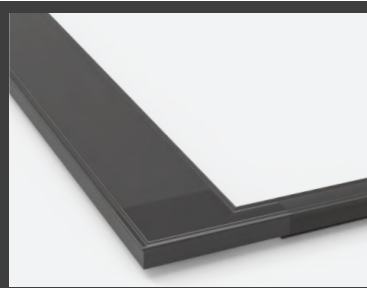


Co-extruded materials create a profile with excellent compression set and a kerf base that is easily inserted into a channel.



## VULCANIZED CORNERS

Vulcanized or transfer-molded corners improve joint strength, meet aesthetic requirements and ensure material compatibility.



This co-polymer design features an EPDM bulb and rigid plastic base that offers excellent compression set, easily slides into a channel and minimizes stretch.



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For a FREE sample kit email: [ISG-NorthAmerica@cooperstandard.com](mailto:ISG-NorthAmerica@cooperstandard.com)





01



02

### 01. Rail system

The Frameless Hardware Company launched its FHC Advance Series Herc-Door Frameless Door Rail System for glass entrances, which features a unitizing gasket that eliminates the need to manually hold the clamping jaws open and prevents components from falling out of the door rail while affixing to the glass panel. The dual-inclined bearing surface controls angularity, ensuring proper centering, evenly distributed clamping pressure and superior service life in harsh environments.

888/295-4531 | [FHC-USA.COM](http://FHC-USA.COM)

### 02. Digital printing

Sedak now offers the digital printing of precious metals onto float glass. The new product is available in sizes up to 10.8 by 59 feet with gold and silver metals, with a resolution of up to 1024 dpi. The printed side is placed on the inside of the laminate toward the film interlayer, protecting the printed design. Gold and silver printing can also be combined with ceramic color printing, say officials.

+{49}8212-4948-23 | [SEDAK.COM](http://SEDAK.COM)

03



### 03. Lifting device

Hegla and the Hegla New Technology innovation center presented the newly developed V-H 150 seculift, a new generation of the V-H suction device used for lifting, setting down and manipulating glass. Hegla customers' most rigorous safety requirements were integrated into the V-H 150, say officials: the entire work cycle is continuously monitored by the integrated safety control. The device features a clear view of the glass element, good and stable gripping positions, and simple operation.

+{49}05273-9050 | [HEGLA.COM](http://HEGLA.COM)

# SplitFin

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The SplitFin is an integrated and continuous solution for fast, effective and uncomplicated processing of glass sheets. The line is aimed especially at the complete processing of sheets. A significantly higher output is achieved in comparison with individual machines as a result of the distribution of the processing steps (edge polishing and grinding / drilling and milling with water jet / washing & drying) and the associated permanent use of the individual devices. The SplitFin sets new standards, not only through extremely fast cycle times, unparalleled in the industry, but also with regard to ease of maintenance as all of the most important mechanical assemblies are easily accessible and in the dry area as far as possible.

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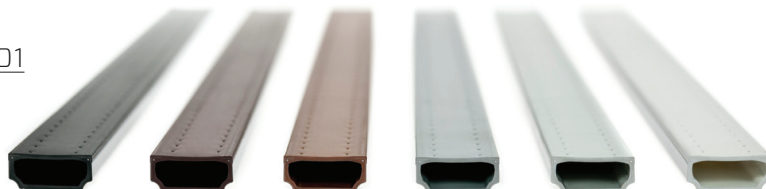


# ***LiSEC***

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01



### 01. Warm-edge spacer

Technoform added a high-profile, plastic hybrid stainless steel warm-edge spacer to its Spacer M family of durable high-performance insulating glass edge seal solutions. The product is composed of high-performance engineered polymer with a thin, low-conductivity stainless steel backing to minimize heat transfer, and to maximize protection against gas leakage and moisture penetration. At 8 millimeters high with the reinforcing wire, the Spacer M high provides improved processability, particularly for the largest insulating glass units, say officials.

330/487-6600 | [TECHNOFORM.COM](https://technoform.com)

### 02. Window hardware

Roto's Patio Inowa is smart hardware for parallel retraction sliding doors and windows made of timber, PVC and aluminum, up to about 440 pounds sash weight. Features include convenient operation due to the closing motion across the frame profile. Inowa also offers high impermeability because of the circumferential gasket and active control of all locking points, also in the mullion.

860/526-4996 | [ROTONORTHAMERICA.COM](https://rotonorthamerica.com)

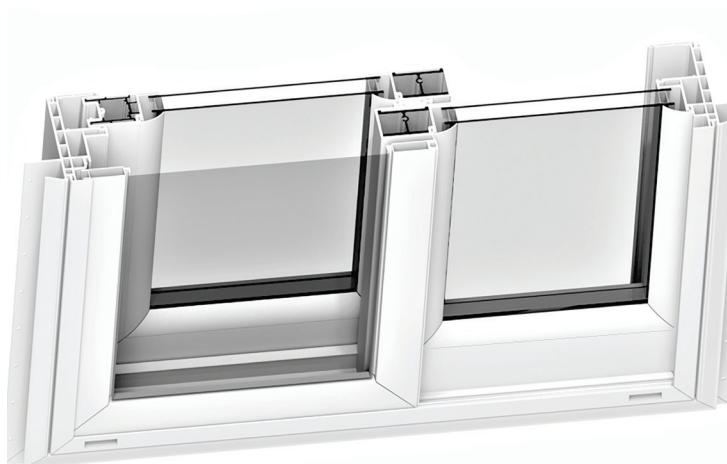
### 03. Patio door

The System 2150 sliding patio door from Rehau is now available. The new door has a structural NAFS rating up to LC-PG45 and is designed to achieve an impact rating up to DP50 at 96 by 96 inches. A 1 1/4-inch glazing channel accommodates triple glazing to increase both energy efficiency and acoustical properties.

703/618-1088 | [REHAU.COM](https://rehau.com)



02



03



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### Apogee Enterprises Inc.

Apogee Enterprises Inc. selected *Nisheet Gupta* as the company's next executive vice president and chief financial officer. Gupta will succeed James Porter, who announced his planned retirement last December.

Gupta joins Apogee from Land O' Lakes Inc., where he has served as vice president, global finance operations since 2017, leading business unit finance and transformation. Prior to his role at Land O' Lakes, he worked for eight years at Diebold Nixdorf, where he held roles of increasing responsibility in the company's finance organization. Previously he served in numerous finance leadership roles with leading global companies including FirstData—now FISERV—Novartis, FedEx, and Ernst & Young.



Wansack

### Vitro Architectural Glass

Vitro Architectural Glass appointed *Sarah Wansack* as commercial account manager for the Southeast region. Wansack will provide sales and service coverage to the nonresidential, commercial construction market for Vitro Architectural Glass. In this role, she will promote the use of Vitro certified products in commercial buildings to architects, specification writers, glazing contractors and fabricators.



Fadel

### YKK AP America

YKK AP America appointed *Ramsey Fadel* as vice president of manufacturing of the company's recently acquired subsidiary, Erie Architectural Products Group. Fadel is now responsible for overseeing Erie AP's project-driven manufacturing strategy and operations. Fadel comes to YKK AP with more than 25 years of leadership experience within the manufacturing industry. He most recently led and managed all plant

operations, maintenance, staff functions, and resources for Hydro Extrusion Canada. In his new position, he will oversee the Erie AP manufacturing team, ensuring it has the right tools and training.



Lopez

### The Glass Guru

The Glass Guru Franchise promoted *Rob Lopez* to the position of vice president of franchise business development. The promotion signifies the importance of the work Lopez has done since coming aboard The Glass Guru franchisor team in 2015, say company officials.

Lopez spends the bulk of his days speaking with franchise owners around business leadership, strategic thinking, and the execution of important local initiatives proven to fuel franchise growth and profitability. He's skilled at getting business professionals to make important promises to themselves about growing their business, say company officials. He then contracts with franchise owners as their dedicated business coach to help facilitate the realization of their own dreams.



Hughes

### Tubelite Inc.

Tubelite Inc. named *Jim Hughes* as client development manager serving the market in Maryland, northern Virginia and Washington, D.C. He reports directly to Tubelite's regional sales manager, Patrick Daniels. They work closely with glazing contractors and architectural teams to provide assistance with storefront, curtain wall, entrances and daylight control systems.

Hughes joins Tubelite with over three decades of experience in the glass and glazing industry. He began his career at Harmon Inc. as a senior sales associate, and included an operations role at Trainor Glass Co. and Fairfax Glass Co. Most recently, he worked as an account manager at Schüco USA.

### Adelio Lattuada

Adelio Lattuada appointed *Gino S. Gramaglia* as its new sales manager. Previous to working for Adelio Lattuada, Gramaglia worked as the sales and marketing manager for C.M.B. Costruzioni Meccaniche Besana S.P.A., and prior to that, he held the same position at Schiavo, according to LinkedIn.

### Viprotron

*Sandra Kugler* joined Viprotron as its new sales manager Europe. Her position in the glass industry was at A+W Software, in software implementation. She then later worked for Saint-Gobain as area sales manager with responsibilities for several regional markets in Europe. After a couple of years, she used her established knowledge when returning to A+W as process consultant and sales manager for Central Europe, as well as key accounts. Her latest position was area sales manager in Bottero Spa, in the Flat Glass Division.

### GIMAV

*Fabrizio Cattaneo* was named as the new director of GIMAV. Taking office immediately, Cattaneo replaces Laura Biason, who left the association at the end of 2019. Cattaneo will assist the board and President Michele Gusti in guiding the association along a pathway of international outreach.



Ike

### Forel

Forel welcomed *Afam Ike* to its sales network. Ike has been working for more than 25 years in the glass machinery trade in Africa, and Forel plans to improve its presence in the region through his connections with African glaziers.

### Glaston

*Arto Metsänen* will retire from Glaston on Jan. 1, 2021, and has stepped down as CEO. Glaston's board of directors nominated current deputy to the CEO, *Sasu Koivumäki*, as acting CEO, and the





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## PEOPLE

recruitment process for a new CEO has been initiated.

Koivumäki joined Glaston in 2002 and has held finance and sales positions in the company. He has been a member of the executive management group from 2012 and was appointed deputy to the CEO in 2015.



Whitehouse

### Soft Tech

Soft Tech hired *James Whitehouse* as program manager to the implementation team.

Whitehouse brings with him years of leadership experience in the industrial, energy and construction industries across the U.K. and the U.S., according to the company.

In his previous role, he led a group of engineers in various lifecycle functions in a manufacturing environment, including the design engineering, door hardware,

technical writing and V6 Design configuration engineering teams.

### The Davlyn Group

The Davlyn Group welcomed *Sujata “Suji” Sullivan* to the company as vice president of sales. Sullivan is a driven business leader with vast industrial sales and engineering experience from roles at manufacturing companies such as Prysmian Group (formerly General Cable) and 3M. Most recently, she was the director of sales for Prysmian’s Electrical Distribution business. She also has experience working for a European technology start-up.

*To submit company personnel news for publication in Glass Magazine, in the e-glass weekly e-newsletter and on GlassMagazine.com, contact Associate Editor Norah Dick, [ndick@glass.org](mailto:ndick@glass.org).*



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### BUSINESS FOR SALE

For Sale: Commercial and residential glazing business in Southern Illinois. Owner is eligible to retire. Truck(s), equipment and stock. Leased building. Approximate gross sales of \$450K/year. Asking \$150K. Please send initial inquiries to: [jerryfsiglass@mvn.net](mailto:jerryfsiglass@mvn.net)

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3-man glass shop 40 years on Florida East Coast. Average gross sales over \$500K per year. Owner may finance. Business \$175K. 772-287-0080

Established 1988, Indianapolis. Profitable & Respected Glass Company. 585K in annual sales. Owner needs to retire after 31 years. Steven Swartz: Broker 317/777-1999 or [stevsellsindy@gmail.com](mailto:stevsellsindy@gmail.com)

### GLASS SHOP FOR SALE

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## HELP WANTED

### Sales Agent Opportunity

IGK, a German-based leading supplier of sealants for insulated glass, is seeking an energetic and industry-experienced independent Sales Agent to contribute to the company's success story in the US market. The sales territory will include the East Coast (Florida to New England), Southern states and parts of the Midwest and Mountain West regions. The independent Sales Agent should have a solid track record of sales success as well as advanced technical knowledge in the insulated glass industry.

#### Responsibilities:

- Prospect, evaluate and develop sales leads through a variety of channels and generate interest in IGK's solutions among target customers
- Develop strong long-term partnerships with customers in the assigned territory by providing technical expertise and excellent levels of service
- Accompany IGK on sales visits to customer sites as appropriate
- Provide full estimation services to customers by analyzing their proposals, specifications and products and services, while applying knowledge of specialized methodologies, techniques, principles and processes.
- Maintain industry and technical product

knowledge by attending relevant educational workshops and company-sponsored technical training and by reviewing professional publications

- Establish and nurture professional networks within the industry
- Provide technical assistance to customers as needed
- Act at all times with the highest levels of integrity and professionalism

#### Qualifications:

- Track record of Sales success in the insulated glass industry supported by a strong technical knowledge in the field. Candidates should ideally bring an existing contact network of potential target customers.
- Excellent communication and presentation skills and the ability to explain advanced technical concepts in layman's terms
- Strong organizational and problem-solving skills
- High levels of enthusiasm, energy and self-motivation
- Ability to travel frequently within assigned territory
- Ability to calculate figures and amounts such as discounts, fractions, percentages, area, and volume.

Send resume to: Christoph Schick (VP), [cs@na.igk.global](mailto:cs@na.igk.global), 872/205-1711.

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The system will accept glass 1/2" (12.0mm) thick by 120" long and runs continuously.

Maximum line speed is 300 Inches per minute on 2.7mm thick glass at a rate of 7500 Square Feet per hour.

Power consumption is 2400 KW/hr. **Price: \$200,000 - this does not include removal cost.**

**Model 2775:** 120 Ft. long x 60" wide system, complete with Quench section and infeed conveyor.

The system will accept glass of similar size and meets performance standards of ANSI Z97.1-1990 per 16CFR 1201.

The operator rooms, Control systems and field devices

(sensors and heating controls) are in place.

The maximum line speed on the 120 Ft. line is 580 Inches per Minute on the thinner glass.

These require 480VAC, 3 phase supply. **Price: \$250,000 - this does not include removal cost.**

Please call Tony Dawson 423-229-1852 or Keith Moody 423-229-1265 for information, pictures and or questions.

Both units can be inspected onsite by appointment only in Kingsport, Tennessee

**Both systems are without Quench and Cooling Blowers, but have ductwork intact that will connect to the quench and cooling systems.**

**All specs are from the Manuals provided by the manufacturer. Both lines are being sold "as is", "where is".**



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Flow description: Washer dryer section, water recirculation system, transport station, Super Spacer applicator, transport station, grid mount station, transport/measuring station, assembly/gas press, sealing robot.

- Lisee Line 1 – 98" x 63" maximum glass size, 10" x 7" minimum glass size. Purchased new from Lisee in 2006.
- Lisee Line 2 – 98" x 78" maximum glass size, 14" x 7" minimum glass size. Purchased new from Lisee in 2007.

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NGA

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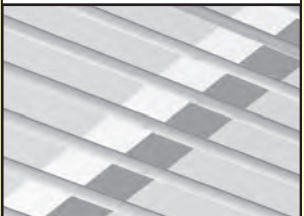
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Companies from all parts of the glass and glazing industry have implemented innovative, out-of-the-box ideas to improve business from the ground up. Here's an Idea showcases these sometimes small behind-the-scenes ideas that can make a big impact on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

## INDUSTRY ENGAGES NEXT GENERATION WITH INNOVATION AND DESIGN COMPETITIONS



**Left to right:** Chris Dimou, Roto North America's president and CEO; David Souder, University of Connecticut Dean, School of Business; Adam Bristol, Roto Frank of America's manufacturing engineer.

### Roto Frank sponsors Invention Convention

Even with distance learning throughout the 2020 school year, 587 young inventors participated in the 2020 Connecticut Invention Convention. Roto Frank of America was a contributing sponsor of the event, and Chris Dimou, Roto Frank of America's president and CEO, sits on the Connecticut Invention Convention Board of Directors. Dimou and Adam Bristol, Roto Frank of America's manufacturing engineer, judged the 2020 competition.

108 Winners from 76 Connecticut schools will go on to participate in the National Invention Convention and Entrepreneurship Expo. Finalists are eligible for awards, grants and sponsorships from corporations, foundations, individuals and academic institutions.

The CIC is an internationally recognized, award-winning, 501(c)(3)

nonprofit educational program that helps develop and enhance critical thinking and problem-solving in kids through invention, innovation and entrepreneurship, according to Roto Frank officials. The convention gives students an introduction to careers in science, technology, engineering and mathematics (STEM). Annually, more than 275 Connecticut schools and 17,000 students, grades K-12, participate in local CIC programs.

### AEC hosts student design competition through ET Foundation

Officials from the Aluminum Extruders Council announced the winners of the ET Foundation's 2020 International Aluminum Extrusion Design Competition. The competition attracted about 130 student entries from nearly 20 countries around the world. Students were tasked with using aluminum extrusions to solve real-world problems.

See the winners at [aec.org](http://aec.org).

The Grand Prize of \$5,500 was awarded to Filippo Tomasi, of Treviso, Italy, studying design at Royal College of Art in London, and Paola Zani from Brescia, Italy, studying design at Politecnico di Milano in Milan, Italy, for their Ippocrate - Portable Isolation Unit for Emergency Situations.

Their design was developed out of a desire to help provide relief for hospitals during the coronavirus pandemic. Aluminum's light weight and the modular design makes the Ippocrate an easily portable and adaptable solution for hospital overflow environments and emergency situations, according to AEC officials.

"In the age of 'COVID' this is a great concept," said competition judge Todd Boyer. "Of all the COVID-referenced projects [submitted in the competition this year] this seems [to be] the most applicable [and] real." ■

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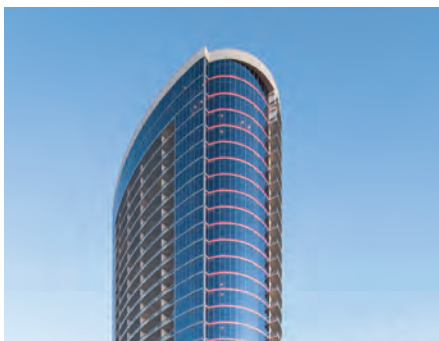
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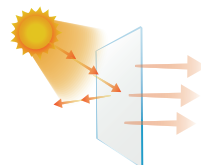
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