Inside: Announcing the USGlass Inaugural Design Awards

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features

Gridlocked

New and advancing technologies offer a great opportunity that can help move glass façades to a new level of performance.

Revitalizing an Icon

For more than 50 years the Space Needle has provided unparalleled views of Seattle. A glassy renovation involving extensive structural glazing is giving visitors even more to see.

"Liting" up Vegas

Las Vegas is filled with stunning examples of glassy luxury hotels and casinos, which makes it a perfect host for the AIA Conference on Architecture 2019. Take a look at some of the glass and metal-related products and educational offerings that will be featured at the show.

The Pinnacle of Glass in Architecture

USGlass magazine is debuting its first design awards, recognizing excellence in architectural glass and glazing. Learn more about this unique program and how you can enter.

columns

departments

on the cover

The newly renovated Space Needle in Seattle features an extensive use of interior glass products, including a revolving glass floor.

Photo: Nic Lehoux

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KEY MEDIA AND RESEARCH

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This month: On-site Coverage of Vessel at Hudson Yards

The recently finished Vessel at Hudson Yards provides a unique visitor experience, and lots of glass. USGlass went on site for an up-close look.

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Project of the Month

Comcast Technology Center

Interior Glass Installation by Eureka Metal & Glass

Send Us Your Glass Projects!

Share your latest project news by emailing images to Ellen Rogers at erogers@glass.com. Include the name and location of the project, architect and types of glass and glazing products. Also, be sure to include any unique details and features about the project.

Photo: © Jeffrey Totaro

The five-story atrium lobby of the Comcast Technology Center in Philadelphia features 2,700 9- by 3-foot decorative glass wall panels installed by Eureka Metal & Glass.

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Bronx Cheer from Bill D.

There's been a lot of talk these past two weeks about the press conference New York City Mayor Bill de Blasio held on April 22. In a 40-minute Earth Day manifesto, Hizzoner touted a "Green New Deal" of his creation that would amend the NYC charter and administrative code to achieve certain reductions in greenhouse gases (GHG) by 2050. The glass industry knows that a move toward its more energy-efficient products generally is welcomed; it helps save energy and provides a value-added product at value-added prices. Requiring such enhanced products means that architects and other design professionals will need to be more aware of all the performance characteristics of glass—energy and otherwise. Doesn't sound so bad, right?

And it wouldn't be, except that Mr. Big Apple chose to identify and focus on one building material as the overriding cause of energy-inefficiency and global warming. Yup, he took off after glass. Consider these comments from his press conference;

> *"Why are we so focused on the building? Because … they are the number one cause of GHG emissions, the number one cause is buildings in this city. It's not the cars, it's the buildings."*

> *"… Part of the problem here is that buildings got built that never should have been built to begin with … And so, we are going to introduce legislation to ban glass and steel skyscrapers that have contributed so much to global warming. They have no place in our city or on our Earth anymore."*

> *"If a company wants to build a big skyscraper, they can use a lot of glass if they do all the other things needed to reduce emissions. But putting up monuments to themselves that harmed our Earth and threatened our future will no longer be allowed in New York City."*

> *"… We are going to make it very clear that the kind of the glass and steel buildings of the past, and some bluntly were being built very recently, are just not going to be allowed anymore."*

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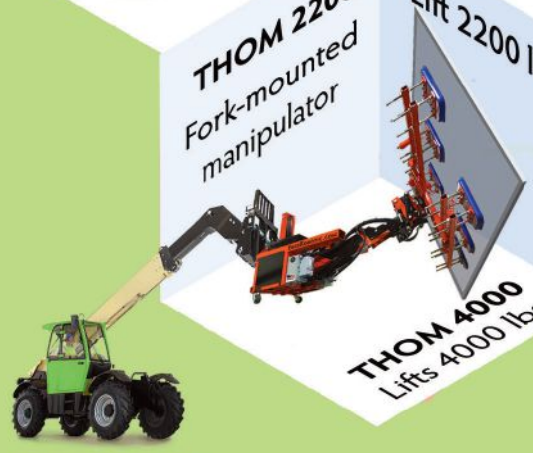

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Now a Reality

The AGMT Certification Program for Glaziers

by Margaret Webb

The IGMA 25-Year Field Correlation Study, completed in 2005, indicated that a large number of the observed failures (though not all) were due to poor installation and glazing methods that held water against the seal. The lack of trained professionals has also been a concern for architects and other building officials.

Now it is possible to have all aspects relating to glazing and fenestration certified, from small components to complete systems. Windows, doors, skylights, curtainwall and insulating glass constructions have been certified to their respective standards for well over 50 years with strong, credible industry product certification programs. Now it is possible to have the installation performed by a certified glazier with the introduction and launch of the Architectural Glass and Metal Technician (AGMT) Certification Program.

How it all Started

In February 2017, a group of interested parties met to discuss the potential for developing a certification program for glazing personnel. There was unanimous consensus to develop this program and the work began. Subject matter experts in the glass and glazing community, including glazing technicians and contractors, architects, engineers, industry consultants and manufacturers, worked diligently over the next 18 months to develop the knowledge-based and performance-based tests. The program development also included professional examination developers to develop multiple versions of the knowledge-based test by engaging industry professionals who lead the question development session held at the International Union of Painters and Allied Trades (IUPAT) International Offices of the Finishing Trades Institute located in Hanover, Md. This was followed by beta testing both test portions in Cleveland, San Leandro and Philadelphia to fine tune the program.

> "Finally, the architects, engineers, building code officials and building owners can have the assurance that their projects meet the highest standards with certified products installed by a certified professional."

Program Specifics

The program scope is to determine an individual's knowledge on glazing theory, utilization of the tools of the glazing trade with demonstration of safe work practices, competency in interpreting construction documents with the ability to lay out and install various types of glazing systems for glass and architectural panels, application of sealants, gaskets and barriers to weatherize those systems, and a working knowledge of quality controls and assurance to minimize construction deficiencies and failures.

The program is administered by Administrative Management Services (AMS), which administers several industry certification programs including the IGCC-IGMA certification program for insulating glass units, the Safety Glazing Certification Council (SGCC) program, the WDMA Hallmark Certification Program and the North American Contractor Certification program, among others. AMS was established in 1998 as a third-party certification provider to the fenestration and glazing industry.

A registered 501(c)3 program, the AGMT Program is sponsored by the Architectural Glass and Metal Certification Council (AGMCC), which plans, organizes, directs and coordinates the certification program.

The program has a handbook, which is indispensable in guiding applicants through the certification program, including prerequisites for qualification, how to prepare for the knowledge-based and performance-based exams, re-certification and personal conduct. All applicants must submit proof of experience demonstrating they have a minimum of 7,500 hours of glazing work within a five-year period by providing proof of successful completion of the Canadian

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the author

Margaret Webb is the executive director of the Insulating Glass Manufacturers Alliance with offices based in Chicago and Ottawa, Ontario.

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Red Seal Certification Program for Glaziers or work history records provided by a third party entity such as previous or current employment, Canadian and U.S. government agencies, such as the IRS, or a union they belong to. They must also submit proof of certification to OSHA 10 compliance or the Canadian equivalent.

Access to locations for the knowledge-based and performance-based exams is facilitated by access via the Certification Information Portal (CIP) available on the AMS website. Candidates can choose their own locations or search for an address. There is accommodation for those candidates with special needs which ensure the integrity of the assessment. The CIP makes application to the program easy. You create an account on the CIP, determine if you meet the prerequisites, register, pay, pass the exam and get certified.

Taking the Test

The performance-based exam is separated into three distinct sections: curtainwall, storefront and sealing. The curtainwall and storefront tests include personal protective equipment (PPE), layout, framing installation, sealing and gaskets. The curtainwall section also includes setting blocks, glazing and pressure bars, while the storefront section includes door installation. The sealing section includes construction documents, backer rod and sealant. All three sections must be passed in the time allotted in order to pass the entire exam. The program also has a review guide for both test portions which are available from the program website (www.agmtprogram.com). In order to achieve certification, the candidate must achieve a passing score of 76% on the knowledge-based test, 77%, 75.5% and 79% on the curtainwall section, storefront section and sealing section, respectively. Retakes are provided for both test portions within 18 months of the initial test.

The AGMT Certification Program is ANSI accredited so a final review to ensure all steps have been completed successfully is required once the candidate has successfully passed both sets of tests. All candidates must agree to the AGMT Code of Ethics.

This is an ambitious program but well worth the wait. Finally, the architects, engineers, building code officials and building owners can have the assurance that their projects meet the highest standards with certified products installed by a certified professional.

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Where's Your Business Headed?

Define a Plan and Stay Focused to Reach Your Goals

by Richard Voreis

Let's talk some more about the best of the "best practices" that can impact you and your business year-after-year—that's why they're called the best. Our clients have already implemented them, so they are proven in the glass industry.

Personal and Business Achievement

Goal-setting can take many different forms. Goals can embrace how a company succeeds or they can address how a person achieves a lifelong dream. Whatever the form, this is the key to success.

I recently read a newspaper article about a young lady who was inspired to climb Mount Everest. She achieved her dream and, in a speaking engagement, said we all have an Everest and we all have to do what it takes to get to the top. How did she make it to the top of Mount Everest and then back home safely? She set goals.

Here's a brief summary of her process:

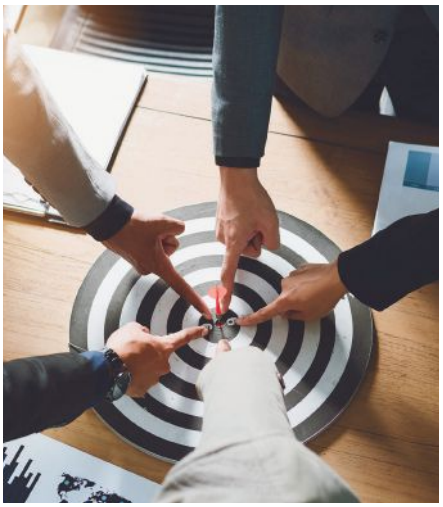
- Define your dream and outline a plan;
- Set a timeline in your plan;
- Think of what it takes to make it a reality; and
- Focus and stay positive.

Keep in mind that in business your process should be:

Specific: Generalities don't get the message across to your employees, so make sure your company goals are easily understood. Nothing is so simple that it cannot be misunderstood.

Measurable: This means goals are quantified and can be evaluated to determine if progress is being made. What gets measured gets accomplished.

Focused: Establishing too many annual goals detracts from your ability to get them accomplished. Experience has shown three or four is ideal and any more than five most likely cannot be accomplished or will reach less than the desired results.



Establishing three to four top priorities will help companies stay focused on their goals.

One-Page Priority Plan

I always recommend to glass and glazing contractors their annual goals not exceed one type-written page. We call this the one-page priority plan and it holds everyone in the company accountable for success. The Mount Everest climber set four goals and I'm sure she established some additional subgoals (objectives) that said exactly how she was going to achieve them.

For your company, I'd recommend setting three to five, with employee objectives supporting each one. Remember, you as the owner do not set the goals; it's a team effort. Many glass and glazing subcontractors have told me they don't have an annual priority plan. How about your company?

In previous articles for **USG**lass magazine, I've stressed the importance of priority planning and how it improves results. Without a priority plan the owner is the only person accountable for the success of the company. The employees establish what they feel are the company priorities and that means too many priorities are being worked on. Some of these may not be as important as others to achieving success. In other words, the team is not focused.

Planning Checklist

Here are a few ideas to help you achieve success:

1. Establish specific and measurable company top priorities for each business year.
2. Establish the top priorities with a team of management and staff so you get buy-in and commitment.
3. Make sure you don't establish too many because you need focus.
4. Make all employees accountable by establishing employee objectives. Make sure they are specific, measurable and time-framed.
5. Monitor the results periodically throughout the year.
6. Link your performance appraisals, salary and incentive compensation to the top priorities and employee objectives. This planning process really works. ■

the author

Richard Voreis is the founder and CEO of Consulting Collaborative in Dallas. His column appears bi-monthly. Email him at rdvoreis@consulting-collaborative.com and read his blog on Wednesdays at dollarsandsense.usglassmag.com.

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Designing for Better Buildings

Education Ensures High Performance Systems

by Helen Sanders

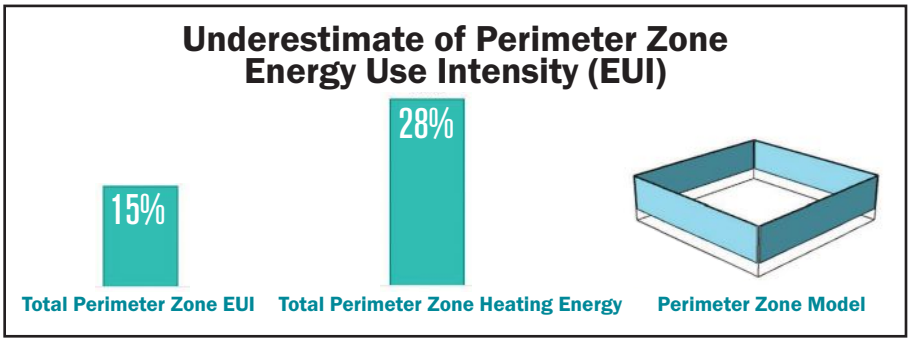
Confusion among the center of glass (COG) performance, thermal performance (U-factor) and whole fenestration unit performance is, unfortunately, all too common in the architectural design and energy modeling communities. COG values are so easy to calculate and obtain from glass manufacturers and are often used instead of overall window performance in building energy modeling. In some cases, the COG U-factor is even thought to be "close enough" to the whole unit U-factor to be a reasonable approximation in building energy modeling. But this is not at all the case and bad outcomes can arise if this mistake goes undetected.

Because the edge of glass and frame generally have higher thermal conductance than the center of an insulating glass unit (IGU), the fenestration edges increase the overall U-factor of the window system. Sometimes, this increase can be large, especially if the frame and edge of the glass are not well thermally broken.

For example, even a typical thermally broken fenestration system may have an overall U-factor of say, 0.45 BTU/°F.hr.ft^2, but can have a 33% lower COG U-factor of 0.30 (air filled, dual pane, low-E^2 coated IGU).

Impact on Energy Performance

Consider a prototypical building located in Minneapolis with a 16-foot-deep by 25-foot-wide by 10-foot-high perimeter zone with 70% window area. A building energy analysis[1] shows that the calculated perimeter zone energy use intensity (EUI) is 15% too low if a COG U-factor of 0.30 BTU/°F.hr.ft^2 is used rather than the full fenestration value of 0.45 BTU/°F.hr.ft^2 across all elevations *(see graph)*.



Calculating whole unit U-factors by using the center of glass U-factor can result in significant gaps between as-built and as-designed energy performance.

The heating energy is underestimated by an even larger proportion (28%), assuming the same window area on all elevations. This could result in significant under-sizing of heating system capacity. These results translate to the total EUI of well daylit buildings, where the perimeter zone dominates the floor plate. With large buildings, where the perimeter zone is smaller compared to the core, the overall impact on EUI will be reduced somewhat, but the potential for substantial discomfort for those occupants sitting near the fenestration remains.

Consequences

Based on this analysis, using COG U-factor in the building energy modeling rather than the whole unit performance can result in significant gaps between as-built and as-designed energy and occupant performance. This is a risk not just for the design team, but also for the glazing contractor, and for our industry in general. In the battle for the wall, it is in no one's interest for windows to be blamed for uncomfortable or gas-guzzling buildings.

Even if the disconnect is uncovered during the bidding and/or construction phase, significant budget, design and schedule problems can result.

Solutions

As an industry we must continue to reinforce education to the architectural and engineering community regarding the use of whole unit U-factors. We must also provide the tools the community needs to (i) more easily derive the whole unit U-factors and (ii) specify the performance of the frame and edge of glass (e.g. a better definition of warm-edge), as well as is currently possible for the COG. ■

1. EnergyPlus from the U.S. Department of Energy.

the author

Helen Sanders is in strategic business development for Technoform North America Inc. in Twinsburg, Ohio. Read her blog each month at usglassmag.com/insights.

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Beware the Adverse Inference

Understanding Spoliation and Evidence Preservation

by Charles A. "Chip" Gentry

My magazine articles often focus on specific client encounters and conversations I've experienced over my 20-plus years of representing manufacturers, dealers and material suppliers throughout the glass industry. However, this time, I will be concise, brief and get directly to the point: When your company receives a notice of a potential claim, such as a settlement demand, lawsuit, cease-and-desist letter, subpoena or preservation letter, consult your attorney immediately. Destroying potential evidence, even inadvertently, might create massive problems for your company. If you or your employees delete emails, texts, documents, throw away templates or products relevant to the pending litigation, or fail to halt your company's automatic disposal or termination system dealing with emails, paperwork or other documents, the consequences could be dire. The opposing attorney will almost certainly file motions for sanctions as a result of the spoiled evidence and, accordingly, the judge may strike your defenses, enter judgment against you or rule that the jury in your case is permitted to make an adverse inference based on your destruction of potential evidence.

Reasonable and Responsible

An adverse inference is an instruction given to the jury at trial that permits them to assume the evidence that was destroyed was, in fact, bad for the party that failed to save or store it. For example, your glass company receives a preservation letter demanding that you save all email communications and other documents between your company and a wholesale purchaser from January 1, 2019 to April 1, 2019. If you fail to do so, the court may permit the jury to assume *(infer adversely)* that those emails contained "bad" information that could hurt your company.

> "In my experience, adverse inference instructions inflame and anger a jury more than just about anything else that can happen in the courtroom."

While it might not seem fair, the court is unlikely to take into account the reason your company failed to preserve the potentially relevant evidence. A best practice you may have seen me write or speak about is to have a document retention/destruction policy. Companies that have automatic deletion processes that clear out their system on set schedules will not be held accountable for document destruction provided (1) the documents were destroyed pursuant to the policy and (2) the policy was suspended once the company had notice of a potential claim. The court expects your company to consult your IT department and make sure those automated processes are stopped in order to comply with the preservation letter. If you do not have an IT department, the court expects you to hire someone who can ensure the potentially relevant information is saved and stored accordingly. The bottom line is this: your company is responsible for saving all potentially relevant information, if it can be done reasonably.

An Angry Jury

In my experience, adverse inference instructions inflame and anger a jury more than just about anything else that can happen in the courtroom. Jurors assume your company purposefully failed to save the information, product, documents or emails because it knew that the information would find your company liable or hurt your case. There may be an explanation as to why the documents were destroyed. But in my opinion, when you're explaining, you're losing. Save the evidence, even if you think it hurts your company. Your attorney can make legal arguments on your behalf, such as the fact that the request is over broad and lacking specificity, that the evidence simply is not relevant to the pending litigation, the information is privileged, etc.

If you receive notice of a potential claim, consult your attorney immediately, then take steps to stop any automatic deletion systems utilized by your company. Your attorney can deal with "bad" evidence; there is little we can do for "no" evidence that has been improperly destroyed. ■

the author

Charles A. "Chip" Gentry is a founding member of Call & Gentry Law Group in Jefferson City, Mo. He can be reached at chip@callgentry.com.

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Defense Mechanisms

ASA Advocates for Subcontractors in the Courts

by Courtney Little

Many subcontractors know that the American Subcontractors Association (ASA) represents commercial construction subcontractors, specialty trade contractors and suppliers before the executive and legislative branches of federal government. ASA represents them in the judicial branch as well.

This past year was a particularly busy one in the courts, where we made sure that the interests of subcontractors, including contract glaziers, were represented on cases that are likely to set legal precedent on issues of importance to our members—and all subcontractors.

Filing an *Amicus* Brief

Most recently, ASA asked the Supreme Court of Texas to reconsider its underlying decision in an important case for employers that pay employees—whose normal duties don't include transportation costs—to transport other employees to/from the workplace. ASA's legal work was financed by its Subcontractors Legal Defense Fund, which is funded through voluntary contributions by its members. This is the only advocacy effort in the courts by a national subcontractor association.

In the Texas case, ASA submitted an amicus, or friend-of-the-court, brief in support of respondent Amerimex's motion for rehearing in the case of *Steven Painter; Tonya Wright, Individually and as Representative of the Estate of Earl A. Wright, III, Deceased; Virginia Weaver, Individually and as Next Friend of A.A.C., a Minor; and Tabitha R. Rosello, Individually and as Representative of the Estate of Albert Carillo, Deceased, (Petitioners) v. Amerimex Drilling I, Ltd., (Respondent).*

In the underlying case, Steven Painter, J.C. Burchett, Earl Wright and Albert Carillo were working the night shift for Amerimex, drilling a well for Sandridge Energy on an oil and gas rig in Pecos County. The prime contract between Sandridge and Amerimex provided that Amerimex was to perform the drilling and provide the work crews. Due to some Sandridge restrictions, the bunkhouse for the Amerimex crew was not as close as it normally would have been, located about 30 miles from the remote drilling site. The prime contract provided that the driller for each crew would receive $50 per day for transporting the crew between the bunkhouse and the drilling site. On July 28, 2007, after the crew's shift ended, Burchett, the driller, was driving the crew back to the bunkhouse and fell asleep. The truck rolled over, ejecting all four members, injuring Painter and Burchett and killing Wright and Carillo.

Burchett received workers' compensation for his injuries after the Texas Department of Insurance determined that his injuries were covered because, the department concluded, he "was paid to transport his crew to and from the worksite and the company bunkhouse." The trial court granted Amerimex's motion for summary judgment, dismissing the claims because "Amerimex is not vicariously liable for the negligence of JC Burchett." The Eighth Court of Appeals, El Paso, Texas, denied the appeal. However, in an April 13, 2018, opinion, the Texas Supreme Court reversed and remanded the case to the trial court, relying on a workers' compensation precedent holding that where an employee transports others to and from the place of employment, as either part of the contract of employment or for payment by the employer, the work is within the scope of employment for purposes of the coverage and protections of the workers' compensation statute. Citing that case law, the Texas high court reversed and remanded the lower courts to determine whether Burchett was acting in the course and scope of his employment at the time of the accident.

Scope of Employment

In the brief, ASA explained that Amerimex is not vicariously liable for the actions of Burchett because even if Burchett was considered an employee at the time of the accident, he was outside the course and scope of employment. "An employer will only be held vicariously liable for the actions of its worker if: (1) the worker was an employee; and (2) was acting in the course and scope of employment." Neither requirement is satisfied in this case. This Court has stated "vicarious liability arises only if the tortious act falls 'within the scope of employee's general authority in furtherance of the employer's business and for the

continued on page 20

the author

Courtney Little is president of ACE Glass Construction in Little Rock, Ark., and serves as the 2018-19 president of the American Subcontractors Association (ASA).

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accomplishment of the object for which the employee was hired.' Traveling to and from work … has been consistently held to be outside the course and scope of employment."

ASA adds that travel reimbursement does not create an exception to the "coming and going" rule. "The contractual $50 per day Driver's Bonus paid to the driller of each crew was a travel reimbursement," ASA wrote. "Travel reimbursements create no exception to the 'coming and going' rule, which states travel to and from a job location is not within the course and scope of employment. The Driver's Bonus was to reimburse workers for the costs associated with a remote drill site ..."

"The lower courts," ASA continues, "correctly applied the principle from *Pilgrim [Pilgrim v. Fortune Drilling Co., Inc.,* 653 F.2d 982, 987 (5th Cir. 1981)] that an employer compensating travel does not create an exception to the coming and going rule. Similar to *Pilgrim*, Amerimex exercised no control and had no right of control over Burchett once he completed his shift. The remote location of the drill site does not affect the coming and going rule, and in fact lends support to the argument that Amerimex is simply trying to reimburse crew members for their added personal costs due to the remote well location. The Court made an unnecessary and incorrect distinction between: (i) a contract requiring Amerimex to hire drivers to provide transportation, and Amerimex deciding to offer that extra work to Burchett; and (ii) the actual contract contemplating that Amerimex would assign the driving task to specific individuals, the drillers."

Subcontractors' Defense

This case is a good reminder of why ASA established its Subcontractors Legal Defense Fund in 1997, and later, the Foundation of ASA established its Legal Research Fund.

These funds do *not* pay the legal bills of individual subcontractors. Instead, they allow ASA to file briefs to advise federal and state courts that may be dealing with a factual situation or a legal issue impacting subcontractors. These briefs inform courts about public policy considerations and practices in the construction industry, as well as how courts in other jurisdictions have addressed the issue under consideration.

ASA recognizes that positive results in one state can benefit subcontractors in other states. Its goal is to add to the decisions that can serve as useful precedents and guidance to courts and legislators addressing the same or similar issues. ■

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What's in Your Spec?

The Keys to Spotting Errors and Deviations

by Steve Marino

Photo: Tom Kessler

One key to any successful building project is developing and adhering to accurate glass specifications. Numerous industry organizations supply best practices, recommendations and specifications that are readily available to help in the glass-specification process.

Premium unitized curtainwall and custom-built façades are par for the course in today's highly creative building designs. Framed by tightening schedules and smaller budgets, successful commercial building projects need all stakeholders pulling on the same rope.

With the increased complexity of façades, glazing contractors rely even more heavily on accurate glass specifications to carry out their jobs. From project conception to completion, specifications provide a necessary "check and balance" to ensure that the proper products are being used and that current industry standards are being followed.

Although glazing contractors need to follow industry best practices, such as proper procedures for glass setting and using the proper glazing sealants, when installing the fabricated product, it's equally important for them to review the glass specifications in their entirety to identify any red flags, errors, deviations from industry standards, special requirements or specific architect requests.

That's not to say the entire responsibility falls on the glazing contractor. Not all specifications are created equal and every party in the supply chain that receives the specification for a particular project—architect/specifier, general contractor, fabricator or raw materials suppliers—is accountable for ensuring that the product it manufactures complies with current standards.

An enormous amount of detail makes up a specification. It can address edicts ranging from general industry-accepted practices to precise performance criteria, such as glass characteristics, thermal and optical properties, and surface orientation for low-E coatings in an insulating glass unit (IGU). Yet, with building designs becoming more intricate and complex, it's increasingly likely that an architect or specifier will add a spec to a construction document that deviates from industry standards.

So, how can glazing contractors best ensure that nothing falls through the cracks, and that the installation of the fabricated IGUs will comply with the specification and meet all stakeholder expectations?

Common Specification Issues

With hundreds of potential variables in any single glass specification, it's understandable that a detail might get overlooked at any point in the process. The impact of such an oversight, though, can range from a developer who is dissatisfied with the appearance of the constructed building to the replacement of all the glass on a project because a performance specification was missed. So, regardless of the fallout, there is a "price to pay" for an inaccurate spec.

It's not a stretch to say that a successful project—one that is completed on time and on budget, and that meets the expectations of the architect, building owner and all other stakeholders—hinges to a large extent on accurate specifications that comply with current industry standards. Being aware of and staying on top of potential issues serves the whole supply chain well. At each stage, it's a good idea to conduct a self-check by reviewing the following questions:

- Are critical specs for the project properly addressed and highlighted sufficiently?

continued on page 24

Leading-edge design for a new living library in Helsinki

"We knew there would be high demands on the glass, especially as it needs to withstand huge loads from the building itself. Thanks to our capability to handle such large glass sizes and with Glaston's ProBend machinery, we were able to supply the glass for its demanding use.".

— Maija Kantelus, Sales Manager, Tambest, Finland

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- Do generic specifications (e.g. general guidelines for glazing) reflect the most current language and standards?
- Is the glazing product written into the glass specification still manufactured by the supplier?
- Does the glass product specified for the project meet or exceed the related ASTM Standard?
- What process is in place to ensure that changes to the specs are properly communicated?

Identifying issues in a specification doesn't require a "needle in a haystack" approach. Checking for these common errors first can often quickly reveal inaccuracies:

- **Copied and pasted specs.** Although a time-saver, copying and pasting information from similar projects can result in references to incorrect products and documents that have been decommissioned. Even though specifications contain standard, generic language, it's critical to review that language for each project, as glass specs and building codes occasionally change.
- **Outdated standard and test method references.** Obsolete standards and test methods can yield additional costs or installations that aren't up to code. In addition, customers can receive inferior products or products that don't meet current standards. Be aware of industry performance standards that have been updated or withdrawn and double-check that any standard referenced in a specification reflects the most current version.
- **Incorrect products.** This issue manifests itself in several ways, including an erroneous or discontinued product that has been specified for a specific application, or a product brand that doesn't correspond to the specified manufacturer. It's a good idea to question specifications of custom products (e.g. tempered glass might not be needed to meet code). Also make sure that treatments such as low-E coatings, opacifiers and frits are appropriate for the surfaces in IGUs and spandrels.

Other areas to check include:

- Are Master Format numbers current?
- Are the referenced companies and suppliers still in business?
- Consistency of requirements—Do they agree across all sections of the spec document?
- Are performance requirements attributed to specific products correct?
- Composition of the product being specified—Is the information provided sufficiently specific?

Once issues are identified, it's critical that glazing contractors inform their subcontractors.

Looking in All the Right Places

So, the specification for a project arrives, and all seems to be in order. It's a fairly standard job.

Or is it?

Perhaps the project isn't so "standard." If glazing contractors focus only on, for instance, the performance criteria for the glass makeup or received just a few select pages of the specification—not the entire Master Spec document—key information could be missed, resulting in a building that falls short of expectations.

Consider the following situation:

The architect has developed a very detailed spec that calls for heat-treated glass to meet the strength criteria for the building. To avoid a distorted, wavy look, the architect designates a "critical performance spec" for flatness. However, this information ends up in a section of the specification that other parts of the supply chain don't typically review. The resulting glass product does not meet the architect's requirements and he or she starts looking for a supplier to blame.

Although the work glazing contractors perform is based only on what the general contractor or architect provides, a little "detective work" can go a long way. Check the entire specification, if feasible, for deviations or critical performance requirements that may be in a different part of the specification.

In addition, communication with upstream and downstream partners is vital. Because they are often more familiar with the overall scope of a project, general contractors can provide valuable insight into the visibility of, or expectations for, the project. For example, the glass specification for a new building being constructed in a major city and surrounded by iconic structures will likely have unique characteristics—perhaps the ASTM specification for a ¼-inch coating void is changing to 1/8-inch because the glass is in a high-traffic area of the building. Knowing the project's prominence, the general contractor can tip off the glazing contractor of a potential deviation in the specs, such as a requirement that is tighter than normal ASTM specifications.

Putting it All Together

One of the keys to a successful building project—one that achieves the look architects envisioned when they designed and spec'd the job—involves the development of and adherence to accurate specifications. Architects set the tone for building projects, but every other element in the supply chain, including the glazing contractor, fabricator and raw materials suppliers, is responsible not only for providing its selected component in compliance with the final glass specification, but also ensuring that those specs are accurate and thorough and reflect the most current industry standards. ■

the author

Steve Marino is the technical services manager for Vitro Architectural Glass based in Cheswick, Pa.

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Glaston Corp. Completes Acquisition of Swiss-German Based Bystronic

Glaston Corp. has completed its acquisition of Bystronic, the Swiss-German based provider of machinery, systems and services for glass processing. The acquisition was originally announced on January 25, 2019 and closed on April 1, 2019.

"The acquisition, which is a major step in the execution of our strategy, is a response to market demand for efficiency, more demanding requirements for glass features, safety and quality as well as an increased focus on services. With our combined capabilities and expertise, we will be able to offer customers equipment, services and solutions from one supplier, optimizing customer operations and driving customer value," says Glaston Corp. president and CEO Arto Metsänen. "The combined services offering will lead to appealing advantages for the customers and provide a base for further development of services covering the whole glass processing chain in the future. I warmly welcome Bystronic's employees to Glaston and this exciting journey."

Changes to the Executive Management Group

In connection with the acquisition, Glaston has made changes to its executive management group (EMG). The EMG will consist of Metsänen, COO and integration lead Sasu Koivumäki and Burghard Schneider, who will be responsible for Bystronic. Juha Liettyä will be responsible for Glaston technologies. Päivi Lindqvist will continue in her position as CFO.

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Greco Aluminum Railings Acquires Petersen Metals

Greco Aluminum Railings, a subsidiary of CSW Industrials Inc. and a manufacturer of engineered railing and safety systems, has acquired Petersen Metals. Petersen is a regional specialty manufacturer and installer of architectural metal products, headquartered in Hudson, Fla.

Dino Aleo, president of Greco Aluminum Railings, says, "Petersen Metals has an excellent track record of profitable growth over almost 30 years while maintaining its commitment to quality, service and technical proficiency. We believe this approach optimizes the company for long-term market leadership."

With the acquisition, Greco expands its market focus from multifamily and commercial construction to now include educational, institutional, healthcare, retail, entertainment and hospitality projects. The addition of Petersen nearly doubles Greco's manufacturing, sales, project management and installation services. Petersen's added manufacturing capabilities include CNC milling and turning, press brake forming, coping, TIG welding and waterjet services, all which enable more efficient production across all product lines, according to the company.

Petersen Metals is a regional specialty manufacturer and installer of architectural metal products, headquartered in Hudson, Fla.

"The strategic integration of Petersen Metals will be implemented over the coming months and will be a critical part of our Greco growth strategy in the United States," says Jim Ellsworth, president of Greco's U.S. operations.

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Mergers & Acquisitions

continued

Assa Abloy Acquires Spence Doors in Australia

Assa Abloy has acquired Spence Doors, an Australian manufacturer of commercial doors.

"I am very pleased to welcome Spence Doors and its employees into the Assa Abloy Group. This acquisition delivers on our strategy to strengthen our position in the mature markets through adding complementary products and solutions to our core business," says Nico Delvaux, president and CEO of Assa Abloy.

"Spence Doors is an excellent addition to the Asia Pacific Division and complements our existing door opening solutions offering for our customers. The acquisition provides potential to accelerate our growth utilizing its comprehensive footprint around Australia," says Anders Maltesen, executive vice president of Assa Abloy and head of the Asia Pacific Division.

Spence Doors was established in 1951 and has approximately 260 employees. The main office is located in Melbourne, Australia.

Sales for 2019 are expected to reach about $47.7 million (AUD 67 million) and the acquisition will be accretive to EPS from the start. ■

Craig Ranch Phase III, McKinney, TX Installing contractor: StazOn Roofing Architect: JHP Architecture
Material distributor: Roofing Supply Group General contractor: Amicus Construction Owner: Lincoln Property Co. Photographer: Tom Coplen
Material: Steel coil Colors: Weathered Steel, Zinc

Weathered Steel Finish

"We really liked the Petersen product. It has a weathered steel look to it and yet it's affordable. We could get the color palette we wanted in a material that we could fabricate in whatever manner fit our design."

-J. Mark Wolf, AIA, Vice President, JHP Architecture

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Accura Systems Celebrates Three Decades in Business

With a little bit of money and a strong, supportive network, Frank Finan created Accura Systems in Sunnyvale, Texas. The framing and glazing system fabricator turns 30 this year, and Finan says much has changed since 1989 when he left Vistawall with his partner, Jose Valdes, to start Accura.

"When we began we were small and not very well financed. As we went along we looked for opportunities," says Finan.

The company's first jobs were in Honolulu when the city was booming, according to Finan. He said the company quickly became experienced in more complex shipping situations, which led to business abroad.

"That market dried up and we came back to the mainland where we were already doing work. My partner was Chilean so we started looking in the market in Chile," says Finan. "We started putting a small sales organization down there and did work in Santiago, Chile. That got us into a different world and we did a fair amount of exporting. It gave us some income to survive the crash of the commercial market in the early '90s. It flourished in that we were also installing in Chile what we produced here. In the U.S. we don't install, only produce."

Finan and Valdes have since parted ways, with Finan keeping the U.S. operation and Valdes taking the Chilean side of the business. Finan says the company has focused on value-added products.

"As time went on we also decided we would do assembly and glazing … We made high-performance windows but they would all be glazed in the field. In Honolulu, the labor market made it not a great place to be working so the clients were demanding a little bit more from us so that they minimized their field operations. Most of what we sent to Honolulu were high-performance windows with glass in it. We were on new ground domestically through factory glazing. That was a pretty major thing for us," says Finan. "As we went on, that aspect of the business was well received and we actually grew as a result of that. Eventually we went into unitized curtainwall; we developed a product we could use, very similar to a pressure plate curtainwall system … We were doing different approaches to more standard curtainwall systems that were in the marketplace."

Accura Systems is celebrating 30 years in business. Its 200,000-square-foot facility is located in Sunnyvale, Texas, outside of Dallas.

Finan says one of the company's biggest accomplishments is its financial stability. He says Accura doesn't borrow and has contained earnings so it can survive the ups and downs of the industry. He owns the company's 200,000-square-foot facility outright, which he says was a major accomplishment.

In the early 2000s, the company began producing blast-resistant framing and secured several projects in the Washington, D.C., metro area.

Finan says one of the major challenges was doing business with the right people and remaining competitive.

Last year marked Finan's 50th year in the glass industry. He plans to retire soon and pass on the company to his daughter.

"A challenge today is getting younger people into the business and passing on the challenges and information learned over the years to new people operating the company," he says. ■

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Technoform Increases Production Capacity at its Twinsburg, Ohio Facility

James Watson working at Technoform's expanded facility in Ohio.

Technoform has doubled the size of its current warehouse in Twinsburg, Ohio, and added capacity to support its customers' product needs and lead times. The location also has added new equipment to increase its finishing and customization services.

"We have experienced tremendous growth and, with advanced equipment, we will continue to improve the speed and quality of the operation to benefit our customers," says market team manager Bill Blazek.

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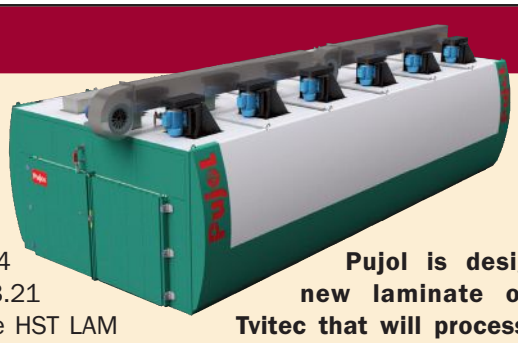
Hornos Pujol to Design Laminating Oven for Tvitec



Pujol is designing a new laminate oven for Tvitec that will process curved laminated glass up to 39.4 feet long.

Spanish companies Hornos Industriales Pujol and Tvitec have signed a commercial collaboration agreement to produce high quality curved glass solutions. Pujol will design an EVA and HST laminate oven measuring 39.4 by 10.5 feet (12 by 3.21 meters) for Tvitec. The HST LAM Multichamber Super Jumbo model is capable of operating simultaneously with two 20-foot (6-meter) chambers. Pujol will fully allocate its cutting-edge technology and its R+D+i programs for the production of this double line for curved glass.

Pujol commercial director Joaquín Pujol (left) and Tvitec general director Javier Prado Ovalle shake hands after agreeing that Pujol will design a laminate oven for Tvitec.

The purchase agreement is the culmination of a technological development process and a close collaboration between both engineering departments of Pujol and Tvitec.

The new oven will process curved laminated glass up to 39.4 feet (12 meters) in length. It is designed for the use or application of EVA and a stronger butyral to guarantee safe laminate conditions in the most aggressive environments, according to the release. This will allow the company to meet customers' requirements, paying particular attention to the type of medium in which each product is developed, according to the company.

The new laminate oven is part of the $22.4 million (EUR 20 million) investment that Tvitec has made to improve its glass processing.

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The additional square footage in Ohio offers a new shipping dock and new larger staging area to enhance the swiftness of the shipment operation. It also houses a new semi-automatic wrapping station and provides new space for returnable rack storage. This year, Technoform expects to continue its increase of product shipments using returnable racks to further reduce waste and continue to increase efficiency.

"Quality and speed to our customers through increased efficiency is the driving motivation for our latest equipment purchases, too," says Blazek. "We recently installed new finishing and packaging machinery that can handle both coils and straight lengths of our polyamide thermal break material, and then semi-automatically wraps it for shipping. This improves the quality and consistency of our wrapping, and significantly reduces our previous, manually intensive process. This frees up our qualified people to perform more important services for our customers."

briefly ...

Vetrodomus, based in Brescia, Italy, has purchased **Forel**'s No Limits insulating glass unit line, which has the ability to produce jumbo-sized glass lites ... **Mappi** recently announced the sale of two furnaces in the U.S. **Clinton Glass Co.**, a family-owned shower door company in Knoxville, Tenn., purchased an ATS ECO 2200x3800 furnace and **Bel Pre Glassworks**, based in Rockville, Md., purchased an ATS 4.0 2500x4200 Xtreme Profile Convection. The company also sold an ATS 4.0 1800x4200 furnace to **Stratoglass** in Northern Italy ... **SmartLift US** has formed an agreement with **Salem Distributing Co.** to act as a distributor for its line of SmartLift intelligent glass handling and lifting machines. The lifting devices are engineered to streamline work processes and, in particular, focus on improving the work environment where heavy lifting and hazardous working postures risk worker injury ... **Cambridge Architectural**, makers of sustainable metal mesh systems for exterior and interior building applications, has named **Oak Tree Building Products** in Lemont, Ill., its manufacturers representative for Illinois, Indiana and Wisconsin. ■

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IUPAT Campaign Combats Suicide and Substance Use Disorder in Construction

The International Union of Painters and Allied Trades (IUPAT) has launched its IUPAT Helping Hand campaign to help combat the high rates of suicide and substance use disorder among construction workers, including glaziers. The goal of the campaign is to raise awareness and provide resources to trade workers.

Construction workers face numerous challenges, including physical injuries that put them at risk to consider suicide or use pills, often opioids, for pain relief and to get back on the job so they can be paid. But that drug use can lead to addiction and substance use disorder, according to the IUPAT.

Substance use disorder isn't the only hardship from which working families suffer. A November 2018 study by the Centers for Disease Control and Prevention found that male construction workers have the highest rate of suicide in the U.S. Other studies show similar results for Canadian workers. The data shows that construction workers are three times more likely to take their own life than the rest of the population.

The IUPAT Helping Hand campaign aims to mitigate substance use disorder and suicide rates within the construction industry by raising awareness and providing resources.

"A couple of years ago, the Painters and Allied Trades for Children's Hope Foundation, a charity organization founded by the IUPAT, launched an initiative with the National Alliance on Mental Illness (NAMI) to raise awareness of how we can all play a part in suicide prevention," says Anton Ruesing, director of the International Finishing Trades Institute (FTI). "This was not only in response to a growing number of reports in the media about how prevalent suicide is in the construction industry, but also to the story one of our contractors shared with us about losing his son to suicide in 2009. Since then, that contractor has been working as an advocate for NAMI."

Ruesing says that story, coupled with how the growing opioid epidemic was taking its toll on the construction workforce, moved IUPAT general president Ken Rigmaiden to direct the FTI staff to create resources and curriculum to help its members, their families and anyone else who is suffering from substance use disorder or thoughts of suicide.

"We want workers, their friends and family to recognize the symptoms of mental health disorders and have access to resources for help," says Rigmaiden.

Resources on the site include:

- The phone numbers for the U.S. National Suicide Prevention Lifeline and the Crisis Services Canada Helpline;
- A list of behaviors that may indicate serious risk for suicide;

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AGMT Certification Program Gains ANSI Accreditation

The Architectural Glass and Metal Technician (AGMT) Certification Program gained accreditation from the American National Standards Institute (ANSI) to the ISO/IEC 17024:2012 standard March 29, 2019. ANSI provides third-party accreditation services.

This achievement comes after a rigorous assessment process where the AGMT program and AMS Inc., the program's administrator and certification body, were evaluated in accordance with the ISO/IEC 17024:2012 standard, an international standard containing requirements for bodies operating personnel certification programs.

"This accreditation is really a recognition that the AGMT program has in place the right people, tools and processes to ensure a fair and valid certification process for each and every candidate...there's no better way to say that than to have an independent third-party organization like ANSI witness the program in operation and attest to that fact through accreditation," says AMS quality assurance manager Terry Schaefer.


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In addition to the resources available on the IUPAT website, the FTI has also created curriculum to, "Change the Culture of Construction." It involves IUPAT members from its district councils being trained to educate members and provide a pathway to treatment.

"We literally do have to change the culture of construction when it comes to these issues and others," says Ruesing. "Men in construction typically have the 'tough guy' mentality that often prevents them from seeking help if they need it, and from reaching out to someone to see if they need help. That has to change not only in the workforce, but with the employers as well."

More information is available at www.lmcionline.org/IUPAThelpinghand.

Arizona Glass Specialists Celebrates 15 Years

With 15 years' experience in the commercial glazing industry, the owners at Arizona Glass Specialists know what is most important to a company's success: its employees. According to Jeffrey Yazwa, pre-construction director for the Chandler, Ariz.-based company, finding solid field and office employees has been one of his company's biggest obstacles over the past 15 years. That is why owners Gary Stevenson and Richard Harmon emphasize good training practices.

Yazwa says that new employees go through a 90-day evaluation period where they are trained in safety and best practices.

"One of the things that we pride ourselves on is that we hire with the assumption that they're staying here for good. We don't hire anyone temporarily," says Yazwa.

Gary Stevenson (left) and Richard Harmon (right), founders of Arizona Glass Specialists, credit their employees for the company's 15 years of success.

After the evaluation period, employees have opportunities to earn salary increases. Every six months the company does informal evaluations to prepare for the annual review, which provides employees with another chance to increase their salary.

"It's important for everyone here to be recognized every year and to make sure that if they deserve an increase in pay that they get it," says Yazwa. "We have things for them to look at and see where they can be in five years if they do what they're supposed to be doing and continue to rise. The sky's the limit."

Yazwa believes this training program improves employee retention. The company currently has 70 employees.

Another major challenge the company has faced in its 15-year history was the Great Recession in 2008. The company maintained its revenue stream by taking on government work in Arizona and neighboring states, and in 2012 began gaining momentum. According to Yazwa, the company's biggest accomplishments have been topping $10 million in one year and getting its foot in the door with general contractors that wouldn't work with the company when it first started. In 2018, Arizona Glass Specialists' revenue was nearly $10.7 million.

Going forward, Yazwa says the company plans to continue growing through its aluminum composite metal business, which has seen more demand from architects in the region, and to switch to doing fully unitized curtainwall. Currently, the company does unitized curtainwall work if the project is right, but often fabricates the frames in shop and installs the glass at the jobsite.

"We're going toward doing more unitized for efficiency and the desire for growth," says Yazwa.

The company focuses on commercial storefront and curtainwall, and specializes in mixed-use, university, government, multi-family and medical facility projects. The company plans to start branching out to neighboring states in the future. ■

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AAMA Webinar Addresses California Law Requiring EPDs

AB 262/1827 applies only to jobs with the State of California—including anything that the state would pay for—and not private projects.

The American Architectural Manufacturers Association (AAMA) hosted a webinar featuring John Jewell, senior consultant with thinkstep. Jewell provided an in-depth look at California's Assembly Bill 262 and the accompanying 1827, which together require facility-specific Environmental Product Declarations (EPDs) for flat glass and other selected products. The bills eventually will set a maximum limit for a product's global warming potential (GWP).

Jewell said facility-specific EPDs are being accepted through 2019 and will be required in 2020. The established GWP baseline will be published on January 1, 2021, and manufacturers will have six months to comply if they wish to work on state-funded projects in California. So far, the law applies only to carbon fiber rebar, structural steel, mineral wool insulation and flat glass—clear or tinted float glass, as well as rolled glass—but not glass in doors or windows, or glass with any additional processing.

Jewell explained that AB 262/1827 also applies only to jobs with the State of California—including anything that the state would pay for—and not private projects. However, the law requires any manufacturer desiring to do business with the State of California to make EPDs available for each facility at which a product they would supply is made (a company with multiple manufacturing facilities will be required to present an EPD for every one of those facilities). These facility-specific EPDs were unexpected by those who work with life-cycle assessments (LCAs) the way Jewell does.

"Folks in the LCA community were surprised that they were facility-specific, not product-specific EPDs," Jewell said. "Your customer doesn't buy a product from your 'Facility A,' but not 'Facility B.' They just want your product and you have to get it to them. If there's a problem at 'Facility A,' you might have 'Facility B' make it and ship it, but usually you're not selling location-specific versions of a product."

Jewell laid out some of the problems that others have already come to identify as well, including establishing a GWP limit. A GWP limit represents the maximum warming potential a product should have in order to be accepted for use in a state project. Only those products that fall below a certain baseline will be accepted. This, he said, will likely create hardships for some companies that may never be able to meet the requirement.

"If their impacts are related to the electricity grid where they operate—if the EPD is mostly associated with the energy they buy and they're in an area where it's mostly coal, there's very little management can do to get below baseline. They can't just move," he explained.

The Weighted Average

Right now, the GWP baseline is set using a weighted average, plus a 20% cushion. However, Jewell said that using a weighted average—even with a cushion—to determine the GWP, could work against the state.

"I would say let's encourage manufacturers to improve, set a high bar so they can achieve it, but if we block half the industry for being 'worse than average' there are a lot of companies that just might pull out of the state," he said. "If the line is drawn in the middle, you don't necessarily have control over the things that might get you into the position where you can qualify to sell to California. Everyone can try and reduce waste, reduce energy. It's great for business and great for the environment, but if incremental changes won't get you there, it's going to put some companies out of business."

In order to develop the EPDs used for baseline/weighted averages, the California Department of General Services (DGS) tabulated the baseline from information available on EPDs that DGS staff members found published on the internet.

"That creates sampling bias," Jewell suggested. "If you want to really reflect the market, you want to look at everyone who creates these products, not just the early movers."

Right now, the DGS is set on following the letter of the law, he added, which means that the door and window markets are not affected—yet—because AB 262 only applies to flat glass, and not glass used in applications. But Jewell warned that could change going forward.

"They've kind of figured out that flat glass isn't sold into buildings, but finished glass products would be," he said, adding that, "Implementation is a bit nebulous the way it is written. If it's enacted as written today, I have no idea if there are enough products that would qualify, as in better than the baseline, to actually build all the buildings California wants built. That should be considered before they roll this out."

briefly ...

The **Insulating Glass Manufacturers Alliance (IGMA)** recently announced that its IGMAC certification program is now accredited by ANSI under Administrative Management Services (AMS).

"Not Guilty" Verdict for Former Sapa Profiles Employee Charged with Fraud

Dennis Merkel, a former production manager for Sapa Profiles Inc. in Portland, Ore., was recently found not guilty of two charges of fraud against the U.S. government in a scheme to falsify tensile test results of aluminum extrusions between 1996 and 2006. Merkel was charged in April 2018.

"Depending on the particular customer that ordered aluminum extrusions from the company, the company generally certified that its products met a variety of ASTM or AMS specifications. Those included ASTM or AMS specifications for three mechanical properties: yield strength, ultimate tensile strength, and elongation," read the initial indictment.

In July 2017, Dennis Balius, a former supervisor at Sapa, pleaded guilty to the fraudulent certification of mechanical properties for parts manufactured by his former employer.

According to the U.S. Department of Justice, Balius admitted that, as a lab supervisor at the company's aluminum extrusion manufacturing facility from 2003 to 2015, he routinely trained and directed lab technicians to falsify mechanical property test results for extrusions that failed to meet industry specifications.

"Balius also admitted that he made, or directed lab technicians to make, alterations to failing test

continued on page 45

Suit Over Leaning Tower Aims to Stop Curtainwall Work, Seeks Redesign

General contractor Pizzarotti filed a suit against developers FPG Maiden Lane and Fortis Property Group in the New York Supreme Court in March, alleging that 161 Maiden Lane in downtown Manhattan is leaning 3 inches to the north due to settlement of the foundation. It claims that the settlement has caused the building's superstructure, including the curtainwall, to lean, making any further work on the curtainwall unsafe.

Pizzarotti claims that FPG primarily considered cost when determining to proceed with a soil improvement foundation method rather than deep foundation piles driven into bedrock, despite a consultant warning that the soil improvement method would result in additional settlement of the foundation.

In June 2018, Pizzarotti's curtainwall subcontractor, AGM Deco, advised that the curtainwall frame, already installed, showed approximately 2 inches difference to the north from floor 11 to 21.

Pizzarotti claims in the suit that, based on expert engineering information and analysis, the increased load from heavy construction elements yet to be added to the structure, such as curtainwall, will cause additional settlement and movement.

The complaint lists several of Pizzarotti's service and safety concerns, including the "strength of the cladding attachments not only in the static lean condition but also in a design wind storm condition. As the change in lean has not been predicted, it cannot be incorporated in the façade panel engineering. The impacts of this can range from inoperable windows to breaking windows and components falling to the street."

The suit seeks a declaration that Pizzarotti's Construction Management Agreement has been properly terminated due in part to more than 120 consecutive days of stopped work. It also seeks a permanent injunction prohibiting defendants and their agents from proceeding with work on the project until an adequate, safe and proper redesign is provided.

A spokesperson for Fortis refuted the claims in a statement provided to Commercial Observer, which originally reported on the suit.

"The fact that Pizzarotti has had more than 70 of its own employees and subcontractors working throughout the building over the past several months substantiates Pizzarotti's duplicity and underlying intent to defame the project. This is simply a matter of a slight redesign of the building's curtainwall, which is already being worked on by our new general contractor, Ray Builders," said the statement.

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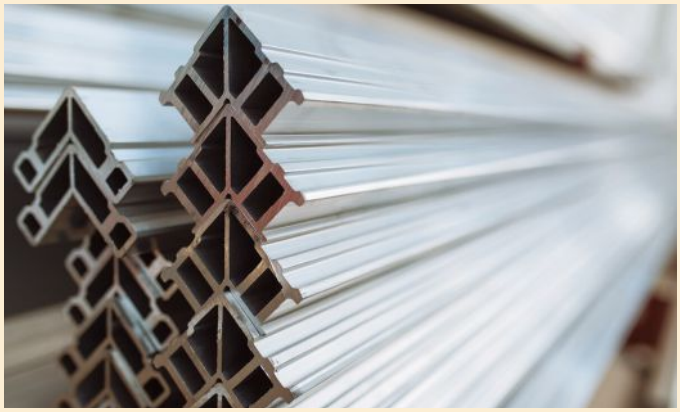
Appeals Court Upholds Ruling that Chinese Curtainwall is Subject to AD/CVD Orders

The U.S. Court of Appeals for the Federal Circuit has affirmed a decision by the Court of International Trade (CIT) that ruled Chinese curtainwall is subject to U.S. tariffs on aluminum extrusions imported from China. Jangho Curtain Wall Americas Co., Permasteelisa North America Corp., Permasteelisa South China Factory and Permasteelisa Hong Kong Ltd. jointly appealed the CIT's decision from December 2017. The decision upheld an earlier scope determination by the U.S. Department of Commerce for the antidumping (AD) and countervailing duty (CVD) orders on aluminum extrusions from China.



A federal Appeals Court ruled that aluminum extrusions imported from China are subject to antidumping and countervailing duty orders.

Background

In 2013, Shenyang Yuanda Aluminum Industry Engineering Co. and Yuanda USA Corp. sought a scope ruling from Commerce that the AD/CVD orders do not cover curtainwall units when imported under a contract for an entire curtainwall. Commerce solicited participation by interested parties Jangho and Permasteelisa.

In March 2014, Commerce rejected their position and ruled that the AD/CVD orders cover curtainwall units. The companies challenged the ruling with the CIT, which confirmed Commerce's determination. Jangho and Permasteelisa appealed to the Appeals Court. Yuanda choose not to appeal.

Grounds for Appeal

First, the Appeals Court explained its decision to grant Jangho and Permasteelisa an appeal. The government said it had grounds to dismiss the appeal because the original case focused on Yuanda's merchandise and that Jangho and Permasteelisa were not affected by the original rulings. The Appeals Court decided that there were no grounds for dismissal because the March 2014 ruling from Commerce stated that as a result of Commerce's scope ruling, Jangho and Permasteelisa's curtainwall systems and curtainwall units are now subject to the aluminum extrusions orders.

The Ruling

The Appeals Court upheld the CIT ruling. At issue was the question of whether curtainwall units could be excluded from the AD/CVD orders because they are part of an overall curtainwall.

The ruling reads, "Commerce concluded that the 'finished goods kit' definition applies to curtainwall units 'only if all of the necessary curtainwall units are imported at the same time.' In its narrower ground of decision, adopted after several remands, Commerce interpreted the definition as requiring, at least, that a subassembly include 'all the necessary hardware and components' for, and not 'require further finishing or fabrication prior to,' installation in an overall finished product (here, the curtainwall)."

In its ruling, the Appeals Court says it agrees with both of Commerce's definitions and its finding. The ruling says that substantial evidence supports that finding.

"Commerce compared Yuanda's technical drawings of its curtainwall units to its import documentation and found that the material imported would not complete the curtainwall unit because it did not contain hangers, lock panels, shims, and embeds necessary to piece the curtainwall units together," reads the ruling. "Once the curtainwall units are hung, Commerce added, the purchaser would need to waterproof the connection between adjacent units and trim and punch the units to ensure that they fit next to each other."

Response

Architectural Glass & Aluminum Co., Walters & Wolf, Bagatelos Architectural Glass Systems and the U.S. were defendants in the appeal.

In a release from the Curtain Wall Coalition, Tom Black, president and COO of Walters & Wolf in Seattle, said, "We are pleased with the Court's decision in this case. After years of litigation tactics by the Chinese companies, the courts have conclusively ruled that aluminum extrusions are covered by the AEC's orders in curtainwall end-use applications. Our efforts now turn to enforcement to derail the circumvention stunts employed by the Chinese companies to avoid paying the tariffs and duties."

At press time, Permasteelisa had not responded to **USG**lass magazine's request for comment.

results if the shipping department asked him to rush an order because ensuring on-time delivery of aluminum helped him and other employees receive bonuses," reads the release.

The case was being investigated by the NASA Office of Inspector General. According to Oregon Live, NASA and the U.S. Missile Defense Agency awarded Sapa contracts to provide aluminum extrusions for rockets. Balius' defense lawyer argued that the case was driven by a company culture to get the metal out. Sapa paid out at least $2 million as refunds to impacted customers concerned about the reliability of the products.

Sapa determined that Balius and the lab technicians altered the mechanical properties of the aluminum extrusions more than 4,000 times, allowing the company to gross more than $6.8 million in total sales based on altered test results.

In August 2018, Balius was sentenced to 37 months in prison, followed by two years of supervised release. He was also ordered to pay $170,825 in restitution.

Sapa was acquired by Hydro Extrusion North America in July 2017.

"Upon learning of the misconduct in 2015, we immediately stopped it and reported the details to government officials. Over the past several years we have undertaken aggressive remediation actions and have invested significant time and resources to completely overhaul our quality and compliance organizations," the company said in a statement to **USG**lass magazine. "This includes the implementation of more than $14 million in state-of-the-art testing equipment across our North American operations that automates the tensile testing process. Throughout this process our primary focus has always been, and continues to be, our customers."

A company spokesperson said Sapa proactively reached out to customers in-person, through email and via mail, and established a technical response team to inform customers of any testing issues that were discovered.

"As part of this process, material for certain customers was retested and there was further dialogue with them to assess the potential impact, if any, on their end products," reads the company statement. "In some situations, this analysis warranted returns, credits and/or replacement material for impacted customers. As a policy, we do not discuss the specifics of customers or markets affected by this situation." ■

Vitro Glass' Plant in Fresno, Calif. Earns Energy Star Certification

Vitro Architectural Glass (formerly PPG Glass) announced that its Fresno, Calif., facility has earned the U.S. Environmental Protection Agency (EPA) Energy Star certification for superior energy efficiency.

The Fresno plant, which operates an oxygen-fuel-powered (oxy-fuel) glass furnace, earned the certification by registering an energy performance score ranked in the 75th percentile or higher among other float glass manufacturing plants in the United States. According to the Energy Performance Indicator (EPI), the benchmarking tool established by Energy Star, the Fresno plant scored in the 100th percentile among its peers.

"We are extremely proud of this achievement because it recognizes and rewards the extraordinary commitment our Fresno staff makes every day to operating a world-class manufacturing plant," says Roberto Cabrera, global technology director, Vitro Architectural Glass. "The certification also signals their dedication to one of Vitro's core corporate values, which is to operate and grow in harmony with the environment and the communities we serve."

The float line at Fresno was redesigned and rebuilt in 2016 to incorporate the latest advances in insulating refractory materials. The plant also was furnished with automated proximity lighting as well as more energy-efficient motors, pumps, compressors and other equipment. Industry-best operational practices were adopted throughout the facility, as well, according to the company.

Phoenicia and Clear Glass Solutions Open Laminated Glass Recycling Plant in Israel

Phoenicia and Clear Glass Solutions Ltd. (CGS) inaugurated a new laminated glass recycling plant on March 24, 2019. The two companies celebrated the event in the new facility located within Phoenicia's courtyard.

Being the only plant of its kind in Israel, CGS, aims to support a greener world by offering recycling solutions for laminated glass sheets. Eran Haimovich, CGS plant owner (formerly Phoenicia's CEO), believes that this plant is necessary to support all the lamination glass producers in Israel as well as other producers outside of Israel.

Phoenicia Flat Glass Industries is a mass producer of laminated glass products. It produces approximately 3,300 tons of laminated glass monthly. It anticipates that it will be the biggest customer for the new Clear Glass Solutions plant.

Phoenicia and Clear Glass Solutions opened a laminated glass recycling plant in Nazareth Iliit, Israel in March.

Through this recycling process, Phoenicia aims to achieve its goal of reducing carbon demand and environmental pollution. ■

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Fenzi Belgium Grows Manufacturing Hub

Fenzi Belgium recently inaugurated a new area at its manufacturing plant in Vilvoorde, Belgium, dedicated to Luxver manufacturing and research. The line of chemical products for glass silvering has obtained ISO 9001:2015 quality certification.

“…This investment is a direct result of the huge demand for Fenzi products, and of the corporate objective to always work closely with our customers in order to provide them with the best possible service,” says Alessandro Fenzi, CEO of Fenzi Group.

The new area at Fenzi Belgium’s manufacturing plant in Vilvoorde, Belgium, will be dedicated to Luxver mirror-backing paints.

briefly ...

GIMAV participated in the Italian Technology Awards for the third consecutive year by hosting North American students. The delegation of U.S. and Canadian students, winners of the 2018 Italian Technology Awards (organized by the Italian Trade Agency as part of the Machines Italia project), accompanied by two of their professors, were hosted in Italy from November 4-11. ... **Şişecam Group**’s new sustainability pathway, called “Care for Next,” was launched at its International Sustainability Workshop in Istanbul. The pillars of the pathway are to preserve, empower and progress. The company was also included in the “Best Emerging Markets Performers” list containing 100 companies from all over the world. The list is within the scope of the Viego Eiris Sustainability Index 2018 Assessment, which includes 855 companies from 35 sectors in 31 countries.

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OSHA Reverses Electronic Filing to Protect Worker Privacy

A permanent ruling by the Department of Labor's Occupational Safety and Health Administration (OSHA) stirred controversy three years ago when it extended the requirements for reporting employee illnesses and injuries into the digital—and publicly searchable—realm. That ruling proved temporary in January, when the administration walked back some of its requirements for the sake of worker privacy.

OSHA regulation 29 CFR part 1904 requires employers in most industries with more than ten employees to keep records of occupational injuries and illnesses. Employers (including manufacturers) covered by these rules are required to record each employee injury and illness on OSHA Form 300, otherwise known as *"Log of Work-Related Injuries and Illnesses,"* or some equivalent. Employers must also prepare a supplementary OSHA Form 301, *"Injury and Illness Incident Report,"* or equivalent, providing additional details about each case.

At the end of the year, they're then required to summarize those incidents on OSHA Form 300A, *"Summary of Work-Related Injuries and Illnesses,"* as well as post them in a visible location in the workplace. In May 2016, a new requirement enacted by OSHA, titled *"Improve Tracking of Workplace Injuries and Illnesses,"* took measures a step further by requiring companies with 250 or more employees to send Form 300 and Form 301 data electronically, after which the administration would make them publicly available via an online, searchable database. Those requirements did not sit well with some companies, many of which argued that such an open database would sacrifice the privacy of involved employees.

Under the latest ruling, companies with 250 or more employees will no longer have to submit OSHA forms 300 and 301 data electronically.

OSHA officials say those electronic filing requirements were "never enforced." Then, in July 2018, a Notice of Proposed Rulemaking surfaced, aiming to permanently undo some electronic filing requirements, in an effort to restore workers' privacy. That ruling was upheld, in an effort to "better protect personally identifiable information," an official OSHA filing suggests. Going forward, companies are still required to maintain those records onsite, where OSHA officials say they will continue to obtain them as needed through inspections and enforcement actions. Under the latest ruling, companies with 250 or more employees will no longer have to submit forms 300 and 301 data electronically. They will, however, still be required to submit Form 300A electronically.

At the same time, "Elimination of the requirement that establishments with 250 or more employees submit information electronically from their OSHA Forms 300 and 301—a requirement that has not yet been enforced—does not change any employer's obligation to complete and retain injury and illness records under OSHA's regulations for recording and reporting occupational injuries and illnesses," OSHA's filing warns. "The final rule also does not add to or change the recording criteria or definitions for these records."

In addition to continuing to file Form 300A data electronically, employers are also now required to include Employer Identification Numbers (EINs) in electronic submissions, in order to improve the administration's ability to track and analyze injuries and illnesses. ■

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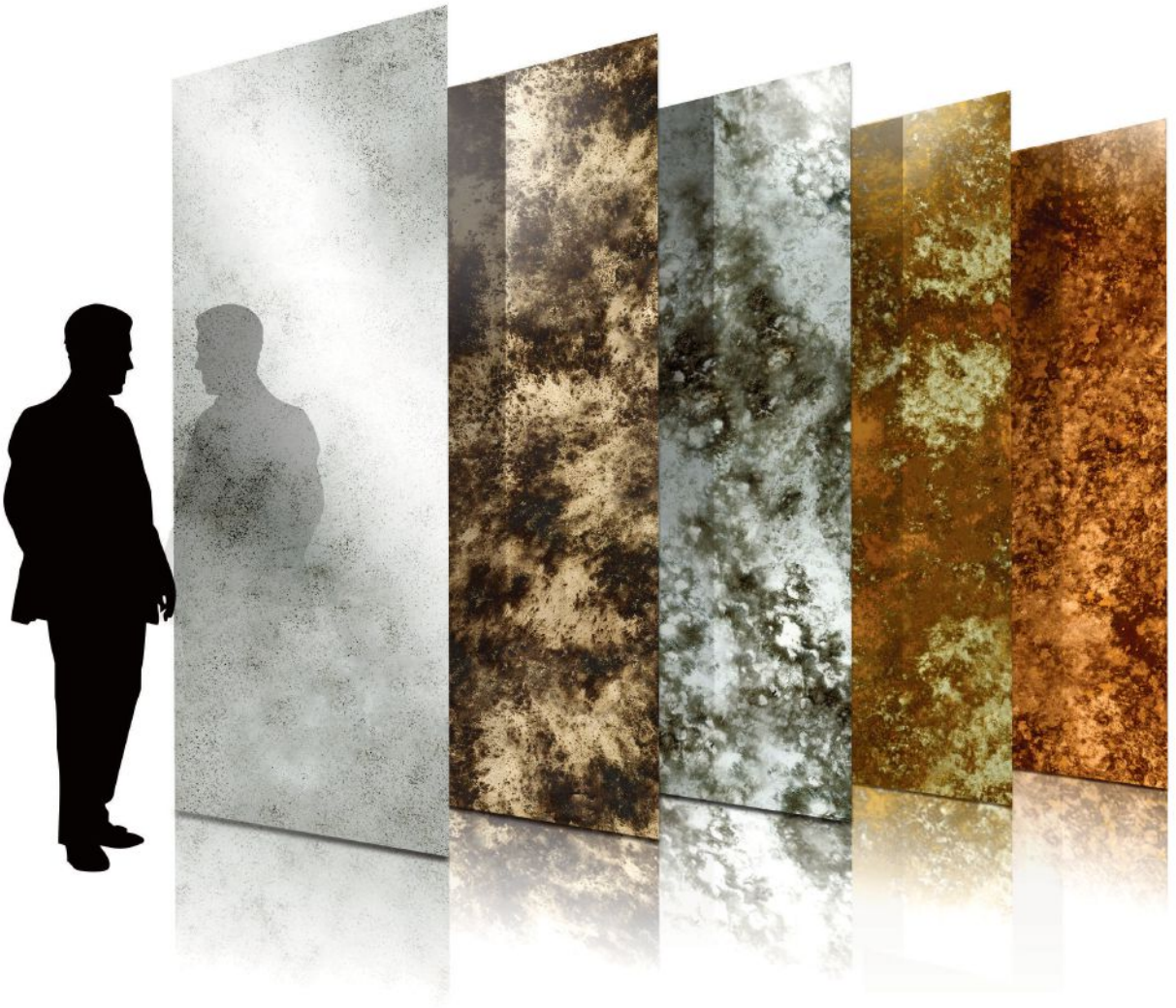

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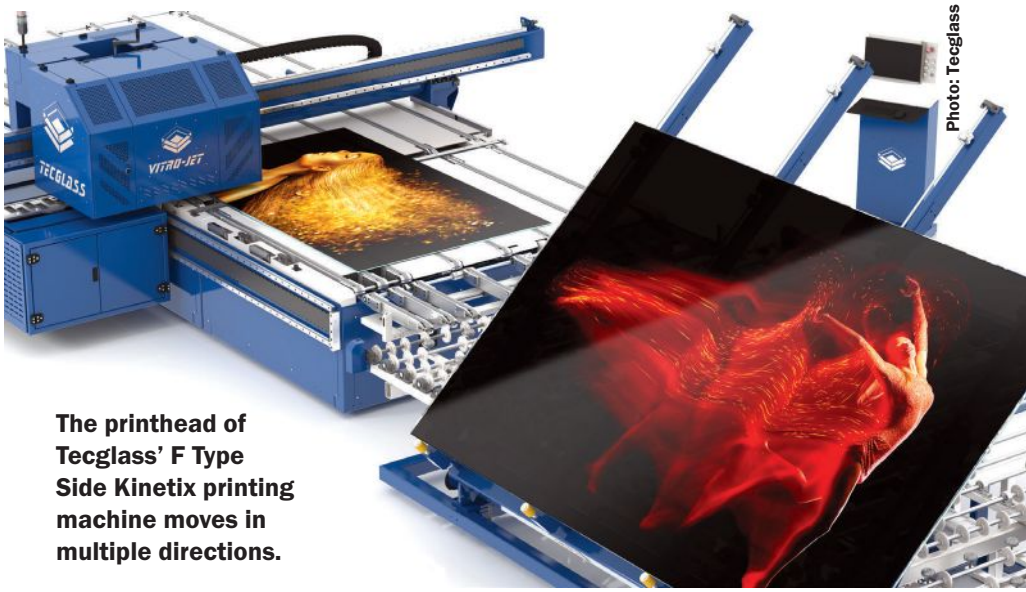
Printing Progress: Developments in Digital and Direct-to-Glass Printing

GGI used direct-to-glass printing on 3/16-inch low-iron laminated glass for the custom designed canopy installed at the Peninsula Hotel in Chicago.

Digital and direct-to-glass printing is no longer new in the glass industry. Since its first introduction to the market more than a decade ago, the technology is now well-established. That's due to advances in speed and print resolution, as well as architects' willingness to specify decorative glass for an increasing number of applications.



The printhead of Tecglass' F Type Side Kinetix printing machine moves in multiple directions.

Starting Out Strong

Rather than being one of the first companies on the market with digital and direct-to-glass printing machines, companies such as Tecglass in Lalin, Spain, and Cefla in Imola, Italy, waited to develop what they consider more established technology.

Javier Fernandez, co-founder of Tecglass, remembers that, in 2009, his company offered a digital printing machine with 1,000 active nozzles per printhead and a resolution of 1,440 dots per inch (dpi). The company achieved this by focusing on research and waiting four years to enter the market, according to Fernandez. He says the printhead technology has been crucial in improving the machine's speed and power.

"The one important factor that made the difference is the close cooperation and hard work with our suppliers and partners which made it possible to have compact printheads that place a lot of [nozzles] in a small space," he says.

Cefla took a similar approach and entered the market after it had more time to mature. Silver Santandrea, research and development manager at Cefla, says that the printheads used on the market haven't really changed in the past ten years. Instead, it's the number that make the difference in speed. According to Santandrea, it's possible to achieve 320 to 645 square feet (30 to 60 square meters) per hour with nine

Photo: Cefla

Cefla's J-Print MP printer includes three vacuum zones to hold the glass in place.

printheads compared to just 21 to 33 square feet (2 to 3 square meters) per hour in the past with a single printhead.

It's in the Ink

Santandrea says that as the company seriously considered entering the market, it focused on which ink to use. It ultimately decided to leave customers free to get their ink directly from a producer.

While the base colors are similar today to what was available ten years ago, metallic inks are starting to hit the market. Santandrea says these can be up to 15 times more expensive than conventional ink, meaning that fabricators want to avoid excess use during the printing process. As a solution, Cefla offers smaller ink containers so that only a small amount is used at a time in the printer.

"The metal ink is expensive and mostly used for special effects so only a small amount is needed," says Santandrea. "We received requests from the market to create a solution so that they weren't throwing away thousands of dollars of ink because they forgot to clean the containers."

Fernandez says Tecglass offers a high flowrate ink recirculation system to avoid the need to clean the heads every day, eliminating ink residue and waste. The company offers gold, platinum and anti-slip inks. It also has inks for coated glass, frosted imitations, pure red and yellow, and has more in the pipeline. He expects the biggest evolution in the future to occur within ink and ink colors.

Santandrea says that with the original technology, the glass had to pass through a drying oven before it could be tempered, now the glass can dry on the printer before being sent directly into the tempering oven.

The Fabricator Viewpoint

The best way to gain insight into the advances in digital and direct-to-glass printing technology is to use the machines over a long period of time. GGI of Secaucus, N.J., first purchased a Dip-Tech direct-to-glass printing machine in 2008, and continues to use that manufacturer's equipment. According to Stephen Balik, director of marketing and architectural sales, the company was one of the first to bring the technology into the U.S.

He says that the maximum printing resolution at the time was 360 dpi. The company upgraded its line in 2015 with machinery that prints with a resolution of up to 1,410 dpi. Despite the improvement in print quality, Balik says a major obstacle for direct-to-glass printing machines is the quality of the image files.

"Being able to print up to 1,410 dpi is reflective of the machine's capability but not the quality of the files," he says. "We're converting existing artwork from a different format, often times from something not digital."

Newer machines can also have up to 12 ink channels, which increases the printing speed, especially if printing in one color. There are only seven core colors but other colors are achieved through digital blending. Balik says the company's original machine had half the number of ink channels.

"We're at the mercy of how many different colors we can actually use at once," says Balik.

He's also noticed advancements in the speed with which ink colors can be changed. With GGI's original machine the ink channels had to be removed, washed and reloaded. Now much of that process has been automated.

However, custom color matching still remains one of the biggest challenges in digital and direct-to-glass printing.

"That never gets easier because we still have to go through the process of getting a digital file and converting it from a file to a piece of paper to glass," says Balik.

Another major advancement in direct-to-glass printing involves movement. The glass would move around under the printer with GGI's first machine. Balik says that when printing on larger lites of glass that movement could lead to alignment issues. With the newer machine the glass stays stationary and the printerhead moves around. This allows the company more flexibility to print on large lites or on multiple small sample sizes at once.

—Jordan Scott

The View From Within

Spotlight on Impressive Interior Glass Applications

Using glass and glazing products in interior applications provides many opportunities. Not only does it create a unique aesthetic that can enhance the space, it can also help stream natural light deep into a space for daylighting purposes. Architects increasingly turn to glass products for their interior projects. These designs include large-scale art glass installations, railings, walls and partitions and more. Here's a look at a few recent attention-grabbing installations.

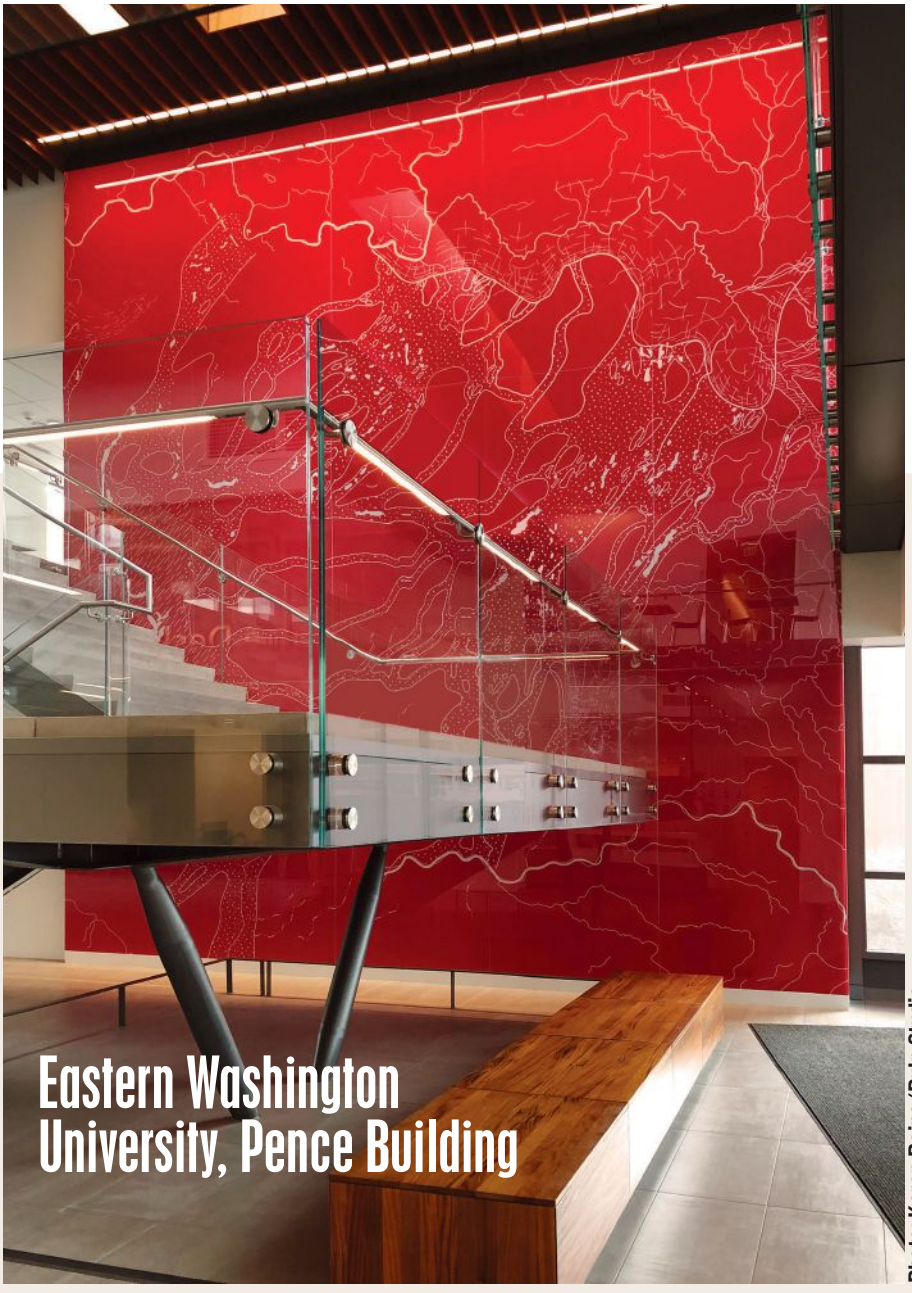


Photo: Karen Rains/Pulp Studio

Eastern Washington University, Pence Building

The Pence Union Building, designed by the Perkins+Will's Seattle team, serves as Eastern Washington University's (EWU) community gathering place. Completed in August 2018, the remodel on the campus in Cheney, Wash., represents a decades-long dream and a multi-year project. EWU Dean of Students Amy Johnson referred to the student union building as the campus' living room, where students can check out laptops and video game consoles, visit the new multicultural center, bookstore, career center, and eat at one of the many cafés and kiosks. The building is a light and open structure with an interior and exterior constructed of wood and glass. The two-story feature wall, designed in the school colors, is a topographical map of the surrounding Palouse hills, where the channeled scablands were created by flooding from the glacial Lake Missoula.

The design incorporates a combination of glass products supplied and fabricated by Pulp Studio. These include custom digital ceramic frit and the company's Pintura water-based backcoated glass on its Light Glass Technology, which is a 1/2-inch honeycomb substrate. In addition, the stair wall features the company's white Pintura glass to create a unique visual aesthetic, as well as a means of egress.

C&S Glass Co., located in Post Falls, Idaho, was the contract glazier.

Carnegie Mellon University, Tepper Quad

Photo: professorcarloscorona.com

Carnegie Mellon University in Pittsburgh recently opened its largest building on campus, the David A. Tepper Quadrangle. Designed by Moore Ruble Yudell Architects & Planners, the five-story, 315,000-square-foot "Tepper Quad" is home to the Tepper School of Business and intersects with the other six Carnegie Mellon colleges and schools. The vast lobby and dining areas allow students and faculty to easily spot one another, promoting an enhanced ecosystem of cross-campus collaboration. Open from floor to ceiling, the design also provides an abundance of natural light that floods the interior, helping to decrease stress levels and enhance overall well-being.

More than 1,800 linear feet of Trex Commercial Products' Track Rail seamlessly adds safety to the high-traffic building. The frameless panels of ½-inch clear glass allow for unobstructed views on the building's stairs and curved overlooks. In addition, ¾-inch clear glass lines the angular welcome staircase, which is tucked to the side, allowing for a more spacious lobby and social areas. Segmented overlook railings are fastened mechanically to structural steel finished with aluminum cover plates, while custom-designed rolled and raked stainless steel cladding lines the three curved staircases.

Oldcastle BuildingEnvelope® was the glass fabricator and Specified Systems was the contract glazier.

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Utah State University, College of Life Sciences

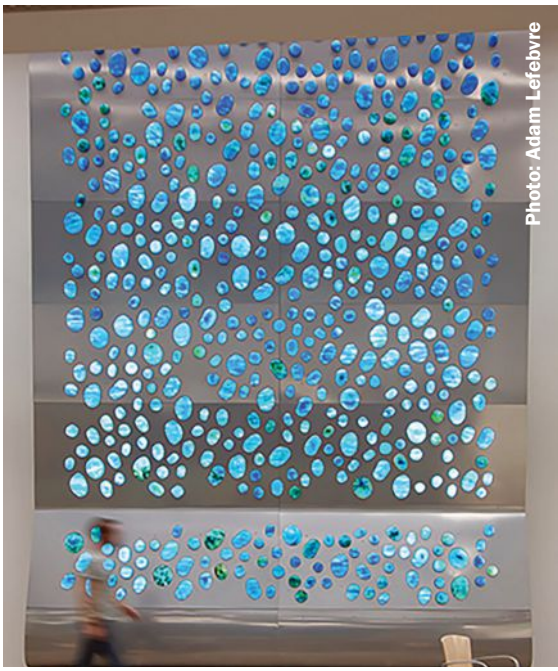
Photo: Adam Lefebvre

The Utah State University and the Utah Division of Arts & Museums chose glass to represent life-sustaining water in its 23-foot-high art sculpture titled "Surface Tension," located in the lobby of its College of Life Sciences building. Completed in December 2018, the installation features 534 unique glass "drops" that cling to a 17-foot-wide steel structure that dominates the interior landscape. The drops range from 12 to 42 inches and were individually cast and affixed to laminated glass bases, illuminated from the sides by an internal LED light. Dependable Glass Works of Covington, La., was part of a team of experts that worked on the challenging project.

According to Amy Landesberg of project design firm Amy Landesberg Art & Design Inc., cast glass was used to "evoke the materiality of water ... water, because there is no biological system without it, and it is therefore crucial to the study of life sciences."

The glass mimics water in three different ways:

Structure: The water drop sizes and shapes were analyzed and used as the basis for casting;

Effect: Glass chill marks and light refraction create watery light; and

Image: Images of life developed with the help of the college faculty can be discerned through careful examination of some of the drops.

Each of the 534 glass drops is unique and their design required a three-step process involving the entire project team. The first step took place at Blenko Glass in Milton, W. Va., where the glass drops were cast in eight custom-designed graphite molds.

The next step involved creating a laminated glass substrate that would prevent glass breakage and securely mount the glass to backing steel. FGD Solutions fabricated a laminated layer of safety glass, cut to match, which was adhered to each cast drop. This translucent layer also diffuses the back-lighting. Next, a specially-shaped piece of laminated glass was cut and joined to the simulated drops. The laminated glass drop shapes were cut on a water-jet cutting table at Dependable Glass Works. Each laminated drop was then laminated to each cast drop.

In addition, the art wall installation is lit internally with two 19-foot-long LED lighting fixtures, one on each side, which can be dimmed as desired. This electrical work was designed and specified by Spectrum Engineers.

Georgia-Pacific Center

Georgia-Pacific (G-P) Center, home of the company's headquarters in Atlanta, is undergoing a major transformation. The offices have not received significant improvement investments since the company moved in 1982. This project, designed by Hendrick and scheduled for completion later this year, completely renovated the company's occupied floors, and includes help from Guardian InGlass products.

Existing walls and furniture are being replaced with various types of open workspaces, while still providing space for quiet, confidential work and conversations. Incorporating glass into the design allows light to move deep into each floor.


Photo: Georgia-Pacific LLC

Guardian clear laminated glass is being used to replace walled-off offices and create individual workspaces designed by Teknion. The laminated glass also provides sound control. In addition, workstations use the company's SatinDeco acid-etched glass on ExtraClear glass, which offers high light transmission, uniform light diffusion and color neutrality. Independent Guardian Select fabricator Oldcastle Building Envelope® fabricated the acid-etched glass, which unlike other frosted glass treatments and aftermarket films that can peel and scratch over time, offers a durable, fingerprint-resistant surface. The glass was installed by TBI Services.

Additionally, whiteboards provided by Clarus and glass conference tables fabricated by GLASSource for Haworth are made from Guardian UltraClear low-iron glass. ■

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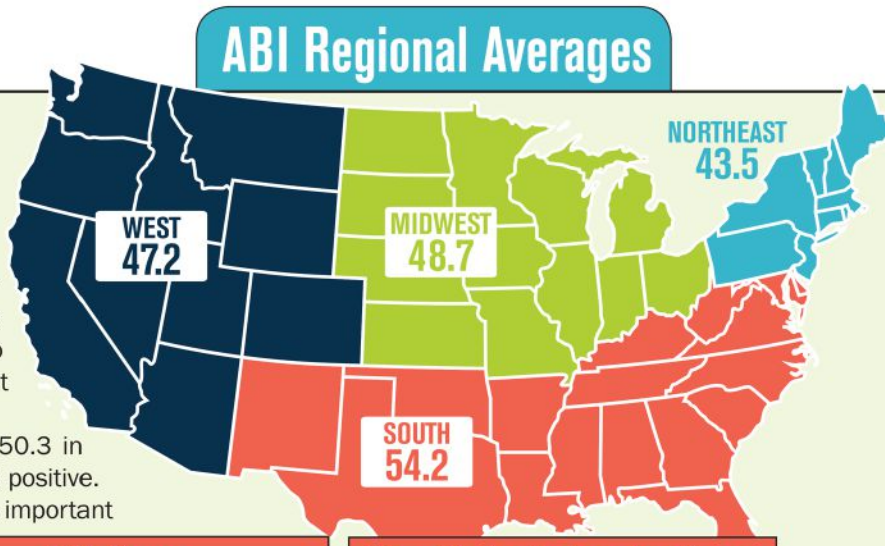
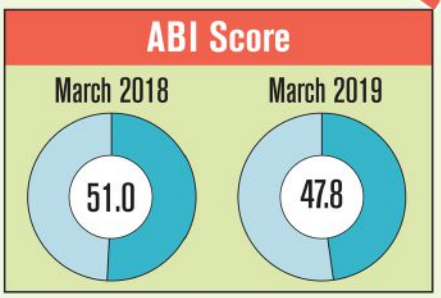
ABI Backslides in March

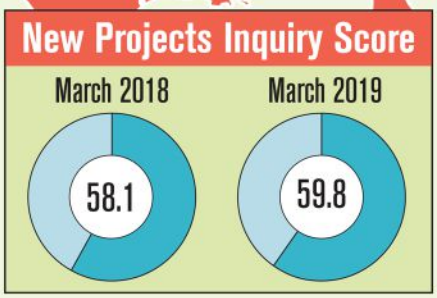
Following consistently increasing demand for design services for more than two years, the Architecture Billings Index (ABI) dipped into negative territory in March, according to a report from The American Institute of Architects (AIA).

The ABI score for March was 47.8, down from 50.3 in February. Indicators of work in the pipeline remained positive.

"Though billings haven't contracted in a while, it is important to note that it does follow on the heels of a particularly tough late winter period for much of the country," says AIA chief economist Kermit Baker. "Many indicators of future work at firms still remain positive, although the pace of growth of design contracts has slowed in recent months."

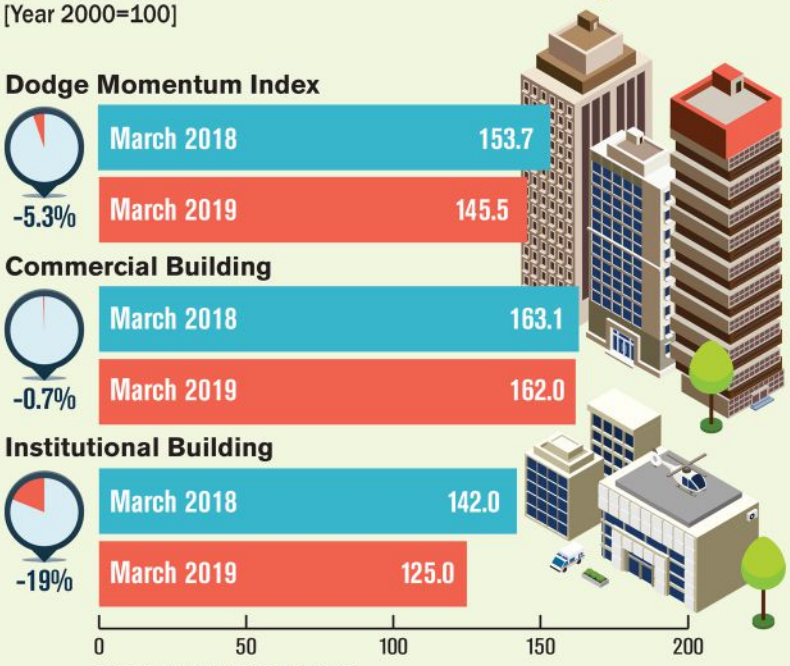






March Construction Starts Surge 16 Percent

[Year 2000=100]



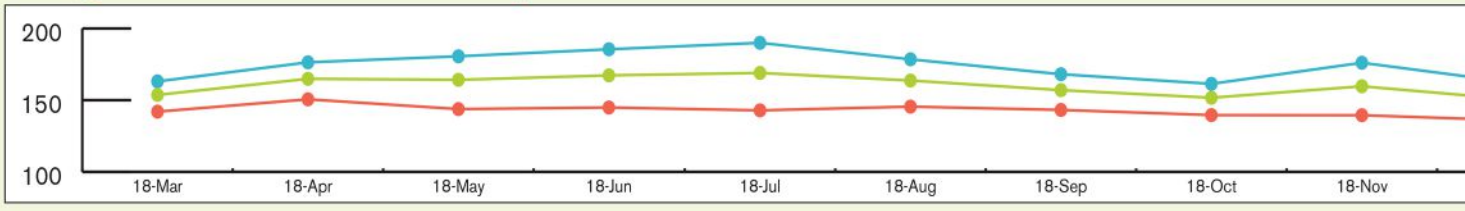
Source: Dodge Data & Analytics

New construction starts in March advanced 16% from the previous month to a seasonally adjusted annual rate of $809.2 billion, according to Dodge Data & Analytics. The substantial gain followed a lackluster performance during the first two months of 2019, as total construction starts in March were able to climb back to a level slightly above the average monthly pace during 2018.

Nonresidential building increased 24% in March, aided by groundbreaking for several large projects. In contrast, residential building slipped 3% in March, as multifamily housing retreated for the second consecutive month.

During the first three months of 2019, total construction starts on an unadjusted basis were $164.5 billion, down 10% from the same period a year ago. On a 12-month moving total basis, total construction starts for the 12 months ending March 2019 essentially matched the corresponding amount for the 12 months ending March 2018.

Dodge Momentum Index By the Month

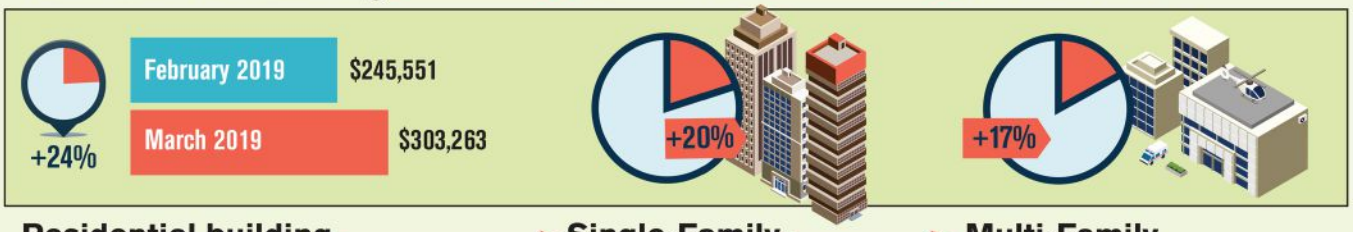


Dodge Momentum Index Inches Higher in March

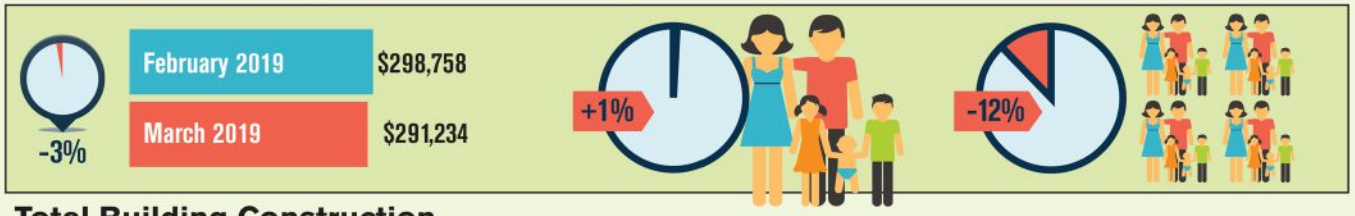
Monthly Construction Starts

Seasonally adjusted annual rates, in millions of U.S. dollars

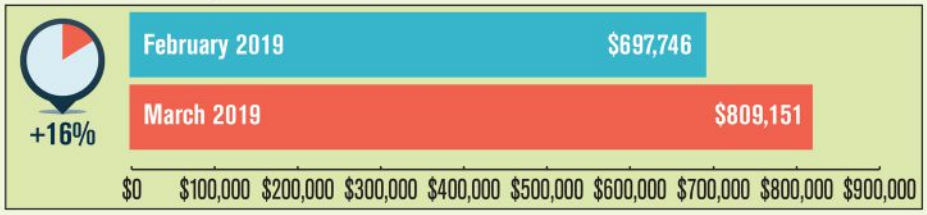
Nonresidential building → Commercial → Institutional



Residential building → Single-Family → Multi-Family

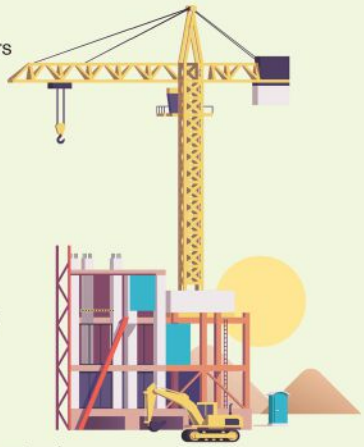


Total Building Construction

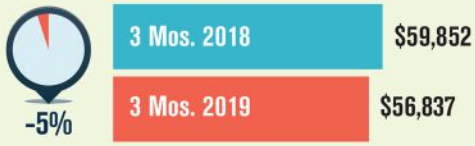


Year-to-Date Construction Starts

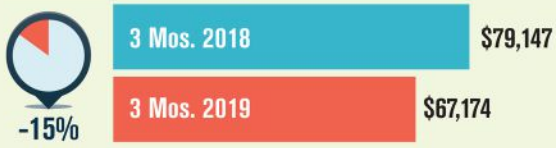
[Year 2000=100] Unadjusted totals, in millions of U.S. dollars



Nonresidential building

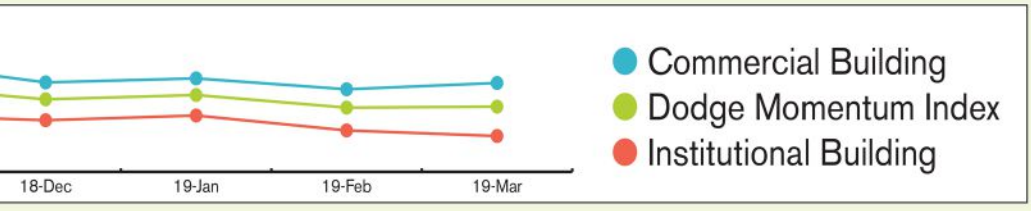


Residential building



Total building construction [excluding electric utilities/gas plants]

Source: Dodge Data & Analytics



The Dodge Momentum Index increased 0.5% in March to 145.5 (the year 2000 = 100) from the revised February reading of 144.8. The momentum index, issued by Dodge Data & Analytics, is a monthly measure of the first (or initial) report for nonresidential building projects in planning, which have been shown to lead construction spending for nonresidential buildings by a full year. The March uptick was due to a 2.8% increase in the commercial component of the momentum index, while the institutional component fell 3%.

The overall index essentially has moved sideways and stayed within a very narrow band of activity since the fall of last year. This is highly indicative of where building markets currently are at this late stage of the construction cycle. While economic growth is expected to ease from 2018's strong pace, relatively healthy real estate market fundamentals and continued support for public projects such as schools and transportation terminals should enable planning activity to remain close to recent levels for the near term.

Gridlo

Glass Can be the Key to Exceeding High-Performance Building Expectations; But How?

by Ellen Rogers

New York City's skyline is one of the most iconic and recognized in the world. From the shimmering 1 World Trade to the newly completed towers at Hudson Yards to the soon-to-be-complete super-thin-super-tall tower located at 111 West 57th St., the city wouldn't be the same without glass. And now New York Mayor Bill de Blasio has suggested "banning" the use of glass that doesn't meet strict performance guidelines *(see sidebar on page 63)*. Is this another battle for the wall?

Armed with an arsenal of benefits, the architectural glass industry has successfully defended the use of high-performance glass in building façades for more than a decade: glass provides natural light; glass provides and improves occupant comfort and well-being; glass aids in reducing and controlling heating and cooling costs. Aesthetically speaking, architects like glass—and there are thousands and thousands of architects in New York City. Imagine if they could no longer design buildings with glass …

Constructing a high-performance, all-glass building that can exceed the baseline energy code is not unheard of. It's already been done. The Tower at PNC Plaza in Pittsburgh, which has more than 400,000 square feet of glass, is such an example. These projects take a carefully detailed and focused design. They require commitment from everyone involved, including the owner and developer. The options are there: double skin façades, triple glazing, and vacuum insulating glass, just to start.

The Spanish headquarters of the real estate company, Lubasa, at Castellón, incorporates the Pellini ScreenLine system of blinds inside the double-glazing unit, which are moved by magnetic controls.

Photos: Pellini SpA

ocked

Photo: Jomar Bragança and Pellini SpA

The Tancredo Neves Administrative City, government headquarters of the Brazilian state of Minas Gerais, used Pellini's ScreenLine Venetian blinds integrated in double-glazing to maximize sun-screening of the windows and bring light comfortably into workspaces.

Adaptive façades, which are designed to respond to their own unique environmental conditions, are another possibility. While still a relatively new concept, adaptive façades are seeing increasing interest. These technologies involve tuning all components of the façade to control daylight and glare, temperature-driven heat flow and ventilation. The use of these systems can also generate significant performance improvements and added functionality compared to static building envelope systems.

"The downside is, it's a system that's complicated to design, it's more costly to spec and install and it's complex to operate," says Steve Selkowitz, an affiliate with the Lawrence Berkeley National Laboratory, Building Technology and Urban Systems Division. "Unfortunately, the architecture, engineering and construction industry hasn't done a particularly good job of making all of the pieces and parts work."

The 2012 Commercial Building Energy Consumption Survey (CBECS) published by the U.S. Energy Information Administration reports that electricity accounts for 60% of the energy consumed in commercial buildings. The survey also notes there's an estimated 5.6 million commercial buildings in the U.S., though many were built prior to 1980, before the high-performance glass technologies we have today, such as low-E glass and insulating glass units (IGUs), were commonly used.

"If building owners invest in high-performance façades they won't have to pay as much for the smaller heating/cooling systems that are required for comfort," says Selkowitz.

Today's commercial construction industry is challenged to find ways to reduce buildings' energy consumption—without sacrificing aesthetics. Adaptive façades, among today's other high-performance glass technologies, represent an opportunity that could provide the solution.

What is an Adaptive Façade?

Traditional buildings are designed as static structures, surrounded by an ever-changing environment. Adaptive façades are designed to respond to those conditions. Selkowitz says if the building design begins with the envi-

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Gridlocked

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Photos: Daniele Domenicali and Pellini

The glazed envelope of the Parallelo business center in Milan, Italy, was designed to optimize the energy required by using different concepts for the varying façades, including the ScreenLine blind system. The blinds can be rotated to ensure optimal protection from the sun, while also allowing exterior views.

ronment in mind, it's clear that a single set of parameters is not ideal.

"The logical outcome is that the façade needs to be able to adapt to its changing occupant needs and varying outdoor climatic conditions," he says, explaining he sees three drivers for the development of adaptive façades.

"The first is people. In the end, buildings are for people," he says. "Thermal and visual comfort, views, health and productivity, all are impacted one way or another by the façade. We want to have a façade that reliably provides the controls needed by people to provide this comfort."

This could be for example, having an automated means to manage the position of a solar shade, rather than relying on manual adjustment.

"Second, the building energy management piece is important. That involves minimizing annual energy use and peak heating/cooling loads. The largest load is usually driven by solar gain coming into windows. So our strategy is to invest more in the high performance façade and less in heating/cooling equipment, ideally for an overall cost savings," he says.

"And third is the increasing focus on the electrical grid and net zero energy buildings. First, you need to minimize energy use with an efficient façade. Then you can generate power at the building [i.e. building integrated photovoltaics], even in the glazing now, and offset those remaining needs. Buildings use more than 70% of all electricity, so they are an important part of the grid," he says. "The key is to intelligently use an adaptive façade to control the building's impact on the electrical grid. A smart façade can provide daylight to reduce electric lighting and can help you manage the HVAC system loads when the grid is overloaded. A smarter, adaptive façade that is 'grid responsive' can help in many ways in the future."

No Simple Task

But there are barriers to acceptance.

"The reaction to these integrated façade solutions is often that this is too complicated, it will never work, and it won't be installed and integrated properly at the jobsite … and that's too often correct because with the fragmented state of the industry today it's hard to do. But it doesn't need to be that way," says Selkowitz. "The technical understanding to make these solutions work reliably is there, but it's not yet to the point where it can be delivered on a routine basis on every project. It's not something any one company can pull off on its own. The façade industry needs to coordinate with the lighting and HVAC world, and within the fenestration industry across the key elements, including electrochromic companies, glass manufacturers, shading suppliers, curtainwall suppliers, etc. Some of those companies are working together more effectively on this challenge. It's happening, but it's a slow process and not delivering the results as rapidly as we need."

He gives low-E glass as an example of a successful large-scale change.

"This went from being a laboratory concept in the 1970s to now capturing 90% of the market," says Selkowitz. "In 20 years will we see that progress with adaptive façades? We need to re-think the whole design-build-operate process and how the supply chain interacts with all parties to make that kind of progress. I think it's an essential goal, but this won't evolve as rapidly."

What Are the Options?

Adaptive façades comprise a number of technologies. Some are common and readily available. Others are still emerging—at least in North America. Selkowitz addresses the options based on their

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Don't Call it a Ban

What New York City's Proposed Legislation Really Means

On Earth Day, New York City Mayor Bill de Blasio announced his plans for a Green New Deal that included legislation to "ban inefficient all-glass buildings." It sounds harsh—a city like New York without a glassy high-rise—but could this actually be a move in the right direction? *(See also page 6)*.

If the legislation passes, the city would allow all-glass façades in new construction only if they meet strict performance guidelines; this would also involve changing the city's energy codes. (At press time there were no details regarding the use of glass specifically.)

This doesn't mean an elimination of glassy construction, but it will require more effort on the part of the architectural design community to ensure the right glass products continue to be used. A change like this could, in fact, push the architecture and construction industry toward higher and higher building performance—while still using lots of glass.

European glass fabricator Interpane has been involved with a number of projects in the U.S., including many in New York. Yago Martinez, business development manager for North America, doesn't see the proposed Green New Deal as an attack on glass façades, but rather the way current energy codes allow them to be inefficient.

"Ever since I started working on U.S. projects I have been surprised at how low the performance requirements are, and how little effort is made to adopt technologies that not only make glass façades more efficient, but have also been on the market for many years and are well-known and proven in other countries," says Martinez. "Most of the glass we supply in Europe is triple-glazed, with high-performance coatings and Argon or Krypton filling; U-values of 0.18 btu/sqf*hr*F or lower are not hard to achieve.

"Glass is a great material for buildings … and it can also perform incredibly well when used right. Argon-filled triple glazed units should be the new standard, and more efforts should be put into enhancing even more façade systems like double-skin walls," he continues.

Organizations such as the American Architectural Manufacturers Association (AAMA) also support a push for more energy-efficient products and buildings, especially for existing buildings where energy efficiency upgrades would have a positive impact on the building's energy consumption and the comfort of occupants.

"Most new and existing products can be designed or retrofitted to meet even the strictest of current energy codes," says AAMA technical director Steven Saffell. "Existing technologies such as low-E glass, high-performance spacer systems, multi-pane insulating glass units and new emerging technologies can be employed to improve energy efficiency of not just the products, but also the entire building. Additionally, the positive impacts of windows, doors and skylights are immense. Fenestration connects us to our environment with views that improve attitudes, increase productivity, provide ventilation and more."

High-performance solutions include wide, complex, aluminum thermal breaks; double skins; multi-cavity insulating glass, high-performance warm-edge spacers and glass coatings; and dynamic shading or glazing.

"In the façade community, we know that highly glazed façades can already be designed to meet high energy performance levels. The technology is available, it just needs to be specified and building owners need to be willing to make the higher cost investment," says Helen Sanders, strategic business development at Technoform North America.

Gridlocked

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energy management functions.

"The first is reducing heat loss/gain. That means a more highly insulated façade to make heat transfer as small as possible, because then the responsibility (and cost) of the HVAC system is less," he says. "We still want views, so that's going to be some form of highly insulating glass. I expect to see a move from today's standard low-E double glazing to something that is at least twice as insulating. That could be triple glazing, which is only 1% of the U.S. market today, or vacuum glazing, which is an emerging product. Moving in that direction will be an enormous improvement and will require window and curtainwall framing to keep pace."

Solar control/daylighting and glare are also significant concerns that can be addressed through the use of adaptive façade products.

"You can control solar gain and glare with dynamic glass or with more traditional interior and exterior shading. We are excited about smart glass—electrochromic and thermochromic, with a preference for electrochromic because you have more control," says Selkowitz, explaining that's because electrochromic glass is controlled actively at any time, by pressing a button, flipping a switch, or via sensor-based building control, while thermochromic tints passively based on temperature.

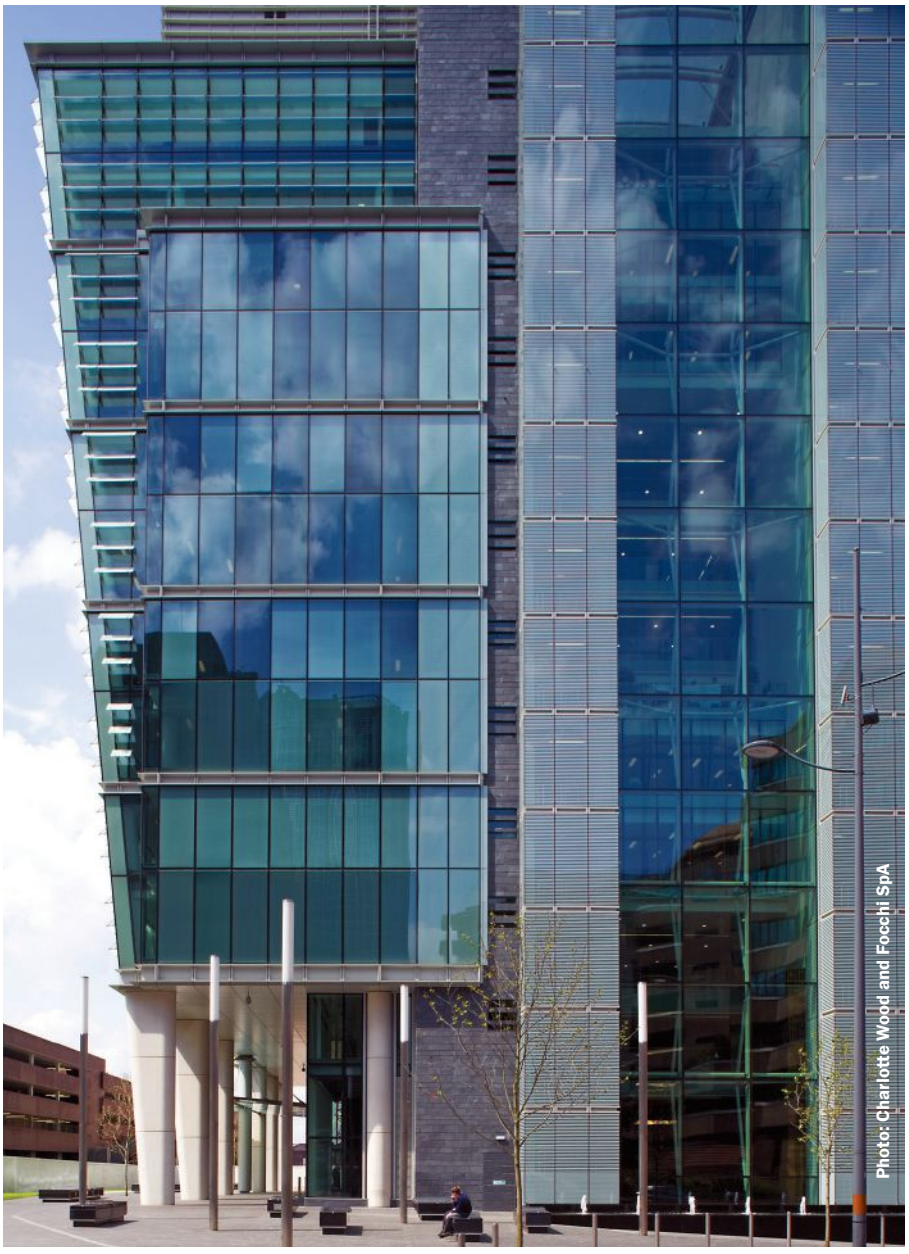
"So it [thermochromic] doesn't always do the right thing when you need it. In general, it's better to have active rather than passive control, but all these products have their niches, especially if the cost of the passive systems can be much lower without the wiring controls."

There are some other barriers to the acceptance of dynamic. For example, he says architects don't always like the color it switches to, it takes time to change tints and it's costly.

"Those companies are all working on this challenge with a major new financial investment, and there are several new companies after 30 years of R&D. That type of competition is great, and we will see better products and lower costs," he adds.

Other options have been available for many years and are much more common in Europe. These include automatic shading and blinds incorporated into the building management system.

"Shading can be much more responsive and adaptive as well, and there are plenty of studies (simulations and measured data) that show if shades are left to be operated manually, people don't use them very effectively. So we want to motorize and automate them to improve their effectiveness," says Selkowitz. "Those costs are also coming down and the performance is getting better as more companies get involved, new research is completed, new ratings from the Attachment Energy Rating Council become available and some of the experiences from the



The southwest-facing façade of the Snow Hill station in downtown Birmingham, U.K., is fitted with motor-controlled blinds inserted inside the double glazed unit.

European markets filter into the U.S."

There's a variety of options for exterior, interior and even between the glass applications. Examples include roller shades, blinds that change as the sun changes, fins, etc.

Intigral Inc., based in Twinsburg, Ohio, is the only authorized U.S. manufacturer of ScreenLine, a blinds-between-the-glass system from the Italian company Pellini. According to marketing manager Jamie Runevitch, they are increasingly focusing on reaching the architectural market, as these products provide many benefits for commercial buildings.

"Automated blinds between the glass are becoming popular with the push for sustainable design. Architects are specifying between-the-glass options because they are able to see the long-term financial benefits and overall environmental improvements of the system," says Runevitch. "Low maintenance, virtually no cleaning and less-frequent replacement make this an attractive addition to building owners. Those reasons, paired with creating a cleaner, more controlled environment make blinds between the

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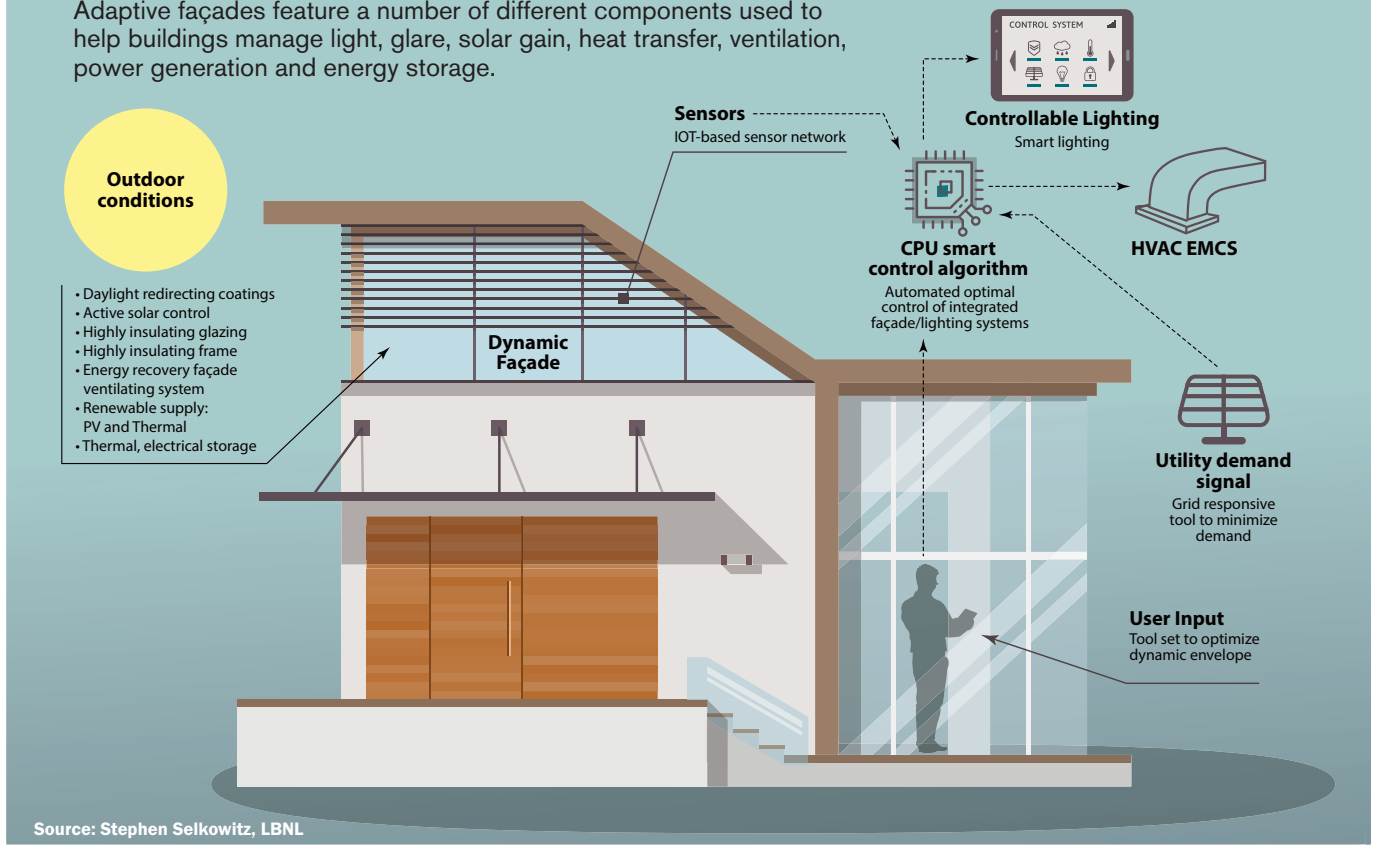
Adaptive Façades Are Intrinsically "Integrated Systems"

Adaptive façades feature a number of different components used to help buildings manage light, glare, solar gain, heat transfer, ventilation, power generation and energy storage.



Source: Stephen Selkowitz, LBNL

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glass a strategic choice for high-performance buildings."

Ventilation is also important. This can come from operable windows, which aren't common in U.S. commercial buildings, though frequently used in Europe. Double skin façades (DSF), which are also more common internationally, can also ensure proper ventilation.

Permasteelisa for example, has developed a moisture-free sustainable closed cavity façade called the mfree-SCCF. This is a DSF where the cavity between the inner and the outer skin is completely sealed and solar shading is integrated within the cavity. As far as the system's energy performance, the U-values are similar to those of a triple-glazed unit with extremely better SHGC performance *(see related article in the February 2017 **USG**lass, page 38)*.

Enclos is another façade contractor that's been involved with a number of DSF projects. According to Jeffrey Vaglio, vice president of the company's Advanced Technology Studio, all DSFs should have blinds or sunshades within the cavity.

"One of the greatest advantages of a DSF is using the outer skin to protect solar control devices (blinds/sunshades) that otherwise would have to be exposed to external winds on a single-skin façade," he says. "A DSF has the potential to improve thermal insulation with an air cavity, improve acoustics, and protect sunshades in the air cavity that mitigate solar heat gain when desired."

The Challenge

The U.S construction market, and glass industry in particular, is standing before a big opportunity. High-performance glazing products, when used as part of a properly designed and built façade can not only enhance, but improve the building's overall energy performance.

But it will take education, focus and commitment, as well as an understanding by the owners and developers that this isn't a cheap and easy quick fix.

But just as the CBECS noted, these buildings are built to last. From its first survey in 1979 to the most recent in 2012, the number of commercial buildings in the United States increased from 3.8 million to 5.6 million—many are still in existence.

"Given the challenge of carbon emissions and climate change, when you're putting up a building that will be there for 50-plus years … let's invest what we can in a high-performance façade as part of the solution to that challenge," says Selkowitz. "It will cost more and will be more complex, but we should do it for [the future built environment]. We are seeing growing interest in this now and I expect to see more in the long run." ■

the author

Ellen Rogers is the editor of **USG**lass magazine. Follow her on Twitter @ EllenGRogers and like her on Facebook at usgellenrogers to receive updates.

Revitalizing an

A Glassy Makeover Gives the Space Needle New Life

by Jordan Scott

The Space Needle has stood 605 feet above the city of Seattle since 1962, giving locals and tourists alike a way to view the city below. In an effort to improve those views and to create a fresh experience for visitors, Seattle-based architecture firm Olson Kundig turned to glass.

"Since 1962, the Space Needle has been a treasured landmark where the public can observe the changing city of Seattle. With the Century Project (the Space Needle renovation), the design intent was to 'widen the lens' of that human perspective. Providing a new sense of transparency, the redesign hearkens back to the Space Needle's original guiding principle: providing unparalleled views," says Alan Maskin, design principal at Olson Kundig. "On the observation level, new seamless floor-to-ceiling glass walls, structural glass barriers and integral glass benches allow visitors to lean into the city below them. Inside, the new Oculus Stair connects all three top levels with a glass-floored oculus at its base. At the 500-foot level, The Loupe is now the world's first and only revolving glass floor."

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Seattle's Landmarks Preservations standards prohibit changes to the exterior profile of the Space Needle.

Photo: Nic Lehoux

Icon

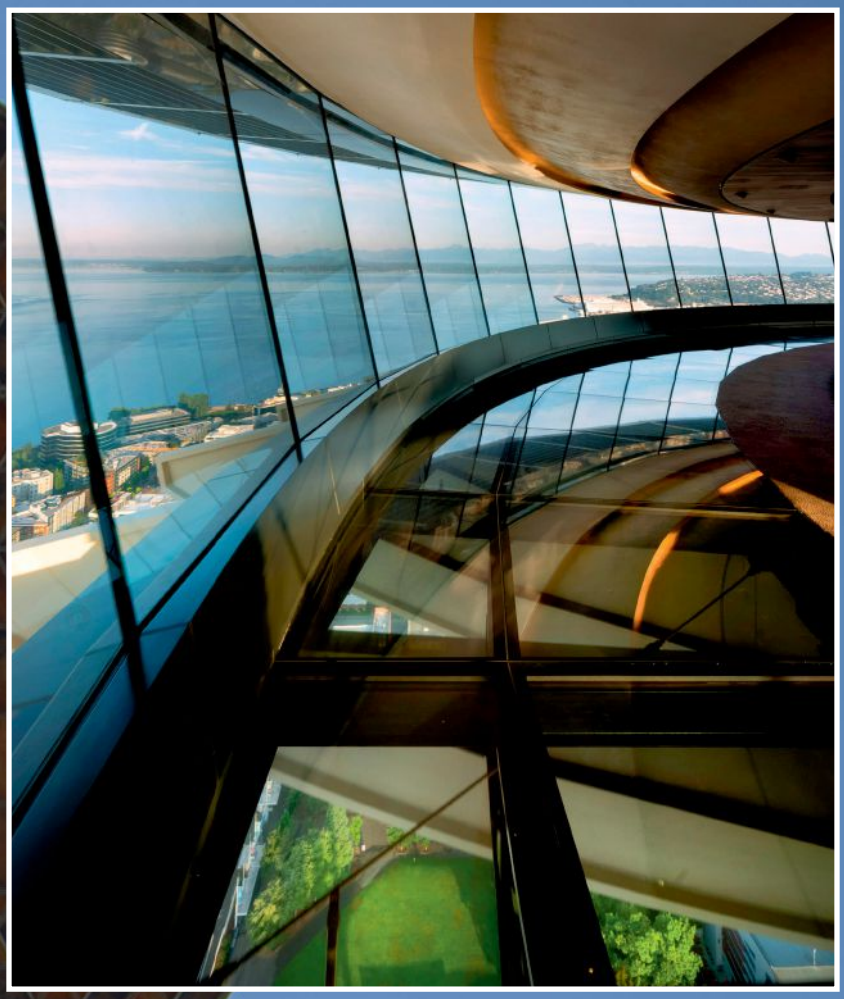

Photo: Space Needle LLC

Photo: Nic Lehoux

The Loupe glass floor is made up of ten layers of structural glass, including a sacrificial lite on the surface.

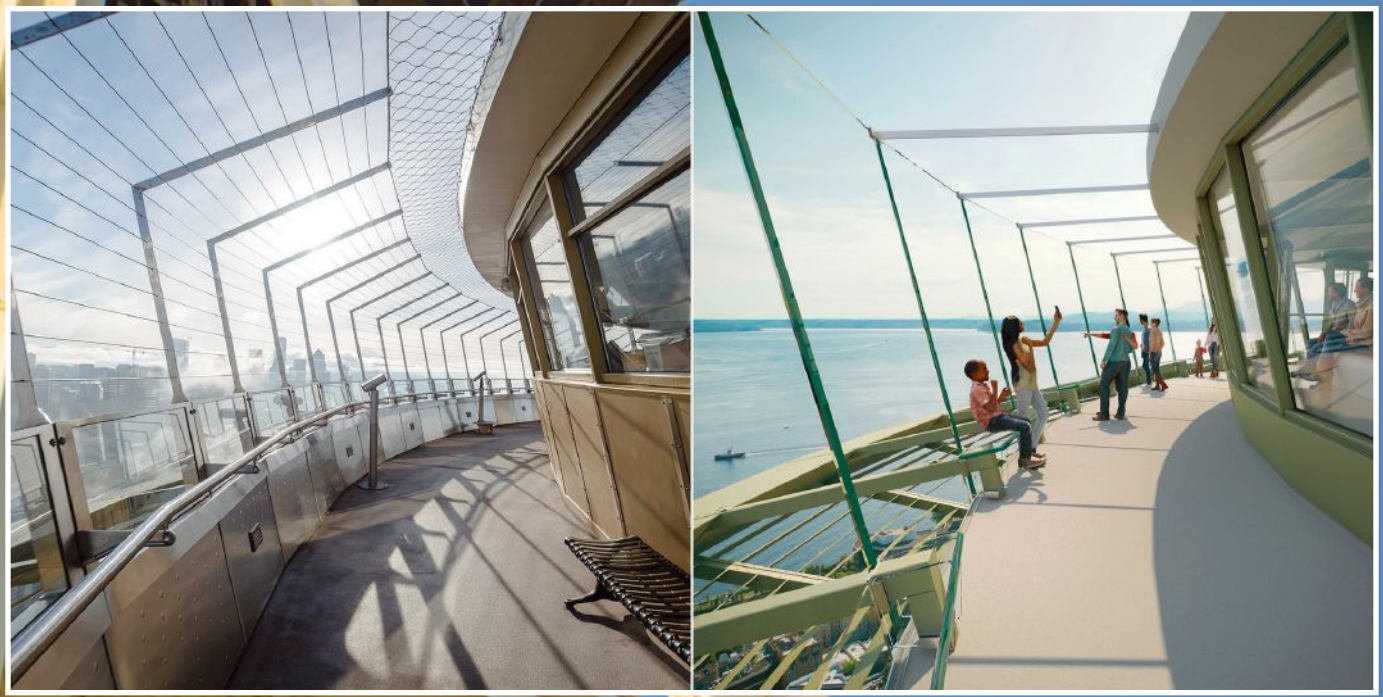

Photo: Space Needle LLC and Olson Kundig

The redesigned Space Needle includes 196% more glazing than the original design.

Photo: John Lok and Space Needle LLC

The Loupe has the world's first, and currently the only, revolving glass floor.

Taking the Floor

The Loupe has two circular segments, an inner solid portion, which constitutes a third of the floor, and the outer segment which consists of ten layers of structural glass. The glazing system includes a sacrificial lite of glass that, if broken, will not compromise the integrity of the structural glass. If the sacrificial lite is broken, it is easier and less expensive to replace than the structural laminated glass it is protecting.

"The unique properties of the interlayer enabled the guards, rotating floor and glass benches to be designed so that if the glass should break, the safety of the occupants would not be compromised and the glass would stay in place," says Ron Hull, Americas marketing manager for Houston-based Kuraray North America. "This also allowed for thinner glass constructions that could not be achieved with traditional flexible interlayers."

Hull says the biggest undertaking for Kuraray was demonstrating that the glass design would be safe in the unlikely event that all the glass broke and the structure had to be retained by the interlayer. All glass structures include a minimum of three structural layers of glass each.

The glass used in the rotating floor was fabricated by Pulp Studio, based in Gardena, Calif. The glazing system is comprised of two 6-mm, low-iron glass lites with a 1.52-mm SentryGlas Ionoplast interlayer on the bottom. A 20-mm Argon gap separates this laminated section from another, comprised of three 10-mm glass lites with two 2.28-mm SentryGlas interlayers. A 0.2-mm clear safety film and a 6-mm glass lite complete the glazing system.

A soffit with a grey frit on the no. 1 surface was installed on the underside of the floor to mimic the color of the Space Needle's original materials. The soffit is made up of two laminated sections, consisting of two 6-mm lites of non-tinted, low-iron glass and an interlayer, separated by a 16-mm Argon gap.

DowSil 795, a structural sealant, was used to adhere the floor glass to the custom aluminum extrusion designed by contract glazier Herzog Glass of Tukwila, Wash.

"What's so unique is that the insulating units were made where the interior lite and exterior lite are both laminated and heat treated. We used an anti-reflective glass in conjunction with a soft coat low-E, and the glass is on a 15-degree incline," says Bernard Lax, CEO of Pulp Studios.

Code-required loads and testing are typically 60 pounds/square foot and 300-pound point loads on floors. The glass floor at the Space Needle was designed for more than 100 pounds/square foot and 600-pound point loads all throughout the floor's surface.

While much has changed about the Space Needle's interior, the exterior has not. Seattle's Landmarks Preservations standards prohibit changes to the exterior profile.

In Full View

The redesigned observation deck of the Space Needle also includes new 11- by 7-foot glass barriers, which tilt outward to match the angle of the building, creating seamless sightlines. These barriers replaced the wire "caging" on the outer observation deck. Twenty-four glass benches, dubbed Skyrises, were also put in place against the barrier, leaning out 14.5 degrees to give visitors a more expansive experience of Seattle.

Not only does the addition of glass give visitors more views of the city, it gives them access to parts of the Space Needle's structure that were previously hidden.

"The new design allows visitors to observe the city of Seattle below—as it was always intended to do—and to see the engineering ingenuity of the original structure in new ways. Original steel columns have been revealed, along with a 10-foot-tall steel girder circling the

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Photo: Rod Mar

Custom equipment was created to handle the glass, which was installed with the Space Needle still open to the public.

mezzanine level," says Maskin. The original steel trusses holding the gold 'halo' have been repurposed to support the observation deck's glass benches. The Loupe gives visitors never-before-seen views of the elevators, the mechanical apparatus powering the floor's rotation and the Space Needle structure itself."

Glass Gets a Lift

A challenge faced by the architect and design team was making the necessary mechanical, building envelope and structural updates, including seismic retrofitting and accessibility improvements, while dramatically increasing the amount of glazing.

"The building is now significantly more efficient than before, meeting current energy codes with an EUI of 306 kBtu/sf/yr, with most energy use occurring in the elevators. This is a significant achievement in a city with one of the most stringent energy codes in the country, especially considering the redesign added 196% more glazing," says Maskin.

The glass installation required custom equipment to handle the glass and elevate it to the top of the Space Needle because many of the glass lites would not fit in the elevators.

"For The Loupe, we worked our way from one side of the structure to the other," says Josh LaSharr, who was an estimator at the time with Herzog Glass *(Editor's note: LaSharr has since left the company)*. "[The glass] was installed starting in one location and then rotating the floor. We had a couple guys push the floor around to move the bay we were working at so we could bring the glass up by elevator. We grabbed it, pulled it from the cart and flipped it over so it was lying flat and then we lowered it down in place."

LaSharr says installing the glass for The Loupe was less of a challenge than installing glass in the Oculus Stair and the upper observation deck.

"For The Loupe, every piece of glass fit in the elevator. We did have to modify some glass carts and cut them down so they would effectively fit into the elevator. That required a little bit of ingenuity on our crew's part," he says. "When we got over to the Oculus, it became considerably more challenging, since the pieces wouldn't fit in the elevator. The glass had to come up via a custom davit crane that had been set up to bring some of the larger glass pieces on the project up, as well as some of the structural stringers for the stairs. Then we built a gantry crane on the interior of the space and used that as a way to hook the glass up and lower it into position."

A temporary work platform was put in place so the glass installation and other updates could occur with the Space Needle still open to the public.

"There was plenty of room under the floor where we had a 3-foot walking space, but as we got out toward the edge, that narrows down to about 18 inches. So our guys had to come up with unique ways to climb in underneath and fasten these pieces of glass down to make sure they weren't going to slide around," says LaSharr, who added that the field leads Robert Wallace and Barry McCann were instrumental to the project's success.

The $100 million Century Project was completed in the summer of 2018. ■

the author

Jordan Scott is the assistant editor of **USG**lass magazine. She can be reached at jscott@glass.com.

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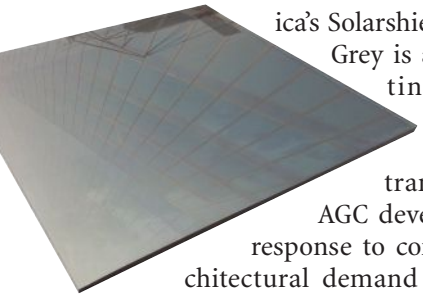
"Liting" Up Vegas

The American Institute of Architects (AIA) Conference on Architecture 2019 will feature products from across all disciplines of building and design. Glass and metal companies are hoping to stand out this year as the event heads to Las Vegas. From frameless shower enclosures to colorful metal panels, the glass industry is pushing the limits of aesthetics and performance with the latest innovations. Architects can visit these companies and many more on the expo floor from 9:30 a.m. to 5 p.m. on Thursday, June 6 and Friday, June 7.

glass

Booth #8309 — Seeing the Light



AGC Glass Co. North America's Solarshield Majestic Grey is a light grey tinted float glass with a high light transmittance. AGC developed it in response to continued architectural demand for a light grey, neutral and tinted glass with a high visible light transmittance. Majestic Grey offers a visible light transmittance of 65%, is available as a monolithic lite for use in laminated, tempered, heat-strengthened and bent configurations, or as part of an insulating glass unit. It also can be coated with an AGC Energy Select low-E coating. Majestic Grey can be specified in 1/4-inch (6mm) and 5/16-inch (8mm) thicknesses.

www.agcglass.com

Booth #6907 — Going to the Birds

For designers seeking high performance, aesthetically-pleasing glass products that also help preserve the planet, Guardian Glass will feature its Guardian Bird1st UV coated glass. Bird1st UV coated glass can be combined with Guardian SunGuard coated glass products to provide a neutral appearance and the desired performance, along with bird safety for new construction and retrofits. The product

Booth #4328 – Arnold Glas Brings a New View

Arnold Glas has several products it will be highlighting, including Ornilux bird protection glass. The company has worked to expand Ornilux, both literally and figuratively, to meet the design needs of the market. Later this year, Ornilux will be available in sizes up to 126- by 472-inches (3.21m x 12m). Previously it was only available up to 102- by 197-inches (2.6m x 5m).

The company also will feature animations and mock-ups demonstrating its "Design Your Coating" service. Customized low-E coatings offer the ability to customize the performance and color of glass as well as designing a single IGU as a graded/blended coating.

In addition, the company will have a video of the Topview StrainScanner in its booth. The Topview StrainScanner was created to measure the amount of anisotropy on glass during production, and provides the ability to make adjustments during the tempering process that can eliminate this issue.

The company will also bring new decorative glass options such as decochrome, a chrome mirror coating that offers new decorative glass options, such as coating patterns that can be custom designed.

www.arnold-glas.com

Glass and Metal Takes the Stage at the AIA 2019 Conference on Architecture


Photo: Eric Jamison/Studio J Inc

works with laminated glass to break up the reflectivity, making the UV vertical stripes visible to birds, but subtle to the human eye.

Bird1st UV coated glass joins Guardian SunGuard coated glass products combined with frit patterns that also help mitigate bird collisions. All products have been tested effective by the American Bird Conservancy.

Guardian will also feature a unique application of its Vacuum IG units and its full roster of high performance SunGuard coated glass products and services, as well as InGlass interior coated glass products.

Also during the conference, Jacob Kasbrick, Guardian Glass' regional architectural manager for the western area of the United States and Canada, will present the continuing education course, "Making Glass Come to Life —The Principles of Glass Selection," Thursday, June 6 from 2-3 p.m. in CE Theater B, Booth #8545.

www.guardianglass.com

Booth #7710 – Glazing with a Purpose

Walker will feature its line of bird-friendly glass products, as well as its line of EPD-certified acid-etched glass and mirror products.

Included in the display will be the company's expanded line of AviProtek bird-friendly glass solutions. According to the company, city and municipal ordinances throughout North America are mandating bird-friendly glass due to the needless deaths of hundreds of millions of birds each year.

One of the offerings, AviProtek E, features visual markers on the first surface with high-performance low-E coatings from Vitro on the second for energy performance.

In addition, Walker has also published third-party-verified environmental product declarations on acid-etched glass, acid-etched mirror and un-etched mirror.

www.walkerglass.com

decorative glass

Booth #7908 — Maximizing Light

Sensitile Systems will showcase products that are designed to emit, transpose, reflect and refract light. The company is also dedicated to sustainable practices and recently received EPD and HPD certifications for all of its materials. Utilizing glass, resin, and terrazzo substrates, Sensitile products manipulate light to maximize lighting in a space. Its laminated glass products are fire-rated and qualify as a safety glazing product.

www.sensitile.com

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"Liting" Up Vegas

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education

Booth #4525LL — A Teachable Moment

During the 2019 AIA Conference on Architecture, Kawneer will focus on education, holding expo education sessions in its learning lounge, located in Booth #4525LL. The sessions, "Designing Innovative Façades for Healthcare" and "Designing High Performance Office/Multifamily Façades Using Innovative Modular Solutions," will be held throughout the day Thursday, June 6 and Friday, June 7. These sessions will offer audiences market-specific solutions to varying design challenges.

www.kawneer.com

shower enclosures

Booth #6329 — Envisioning a Clear Space

C.R. Laurence will exhibit its Clear Space Elliptical frameless shower door concept. Visitors to Booth #6329 will get a chance to see in person how this new type of shower door utilizes a top door guide that folds the door as it opens in like an accordion and swings inward to maximize usable floor space. Clear Space has a 1¼-inch tall top door guide that automatically folds away from the opening and stacks parallel to the sidewall to produce a completely unobstructed entryway.

Clear Space also has the ability to reduce door outswing projection—the company approximates it to be a 45% reduction compared to a standard hinged shower door—which gives architects and designers greater flexibility when laying out other bathroom elements. Two elliptical doors can be specified to create a shower entrance up to 72 inches wide to improve accessibility.

The company is also bringing its Entice Entrance System, which merges all-glass aesthetics with full-frame thermal performance. Vertical stiles of 1-$^{1}/_{8}$ inches create nearly uninterrupted glass spans nestled in thermally broken framing and cladding that C.R. Laurence says creates U-factors as low as 0.43.

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education

Booth #9340 — Bird-Friendly Advocacy

Vitro Architectural Glass' exhibit space this year will be devoted to the promotion of American Bird Conservancy's (ABC) bird collision awareness. The company hopes to further distribute ABC's "bird friendly building design" guide to architects.

According to Robert Struble, brand and communications manager at Vitro, the company's interest in bird-friendly design is three-fold. The company's research and development facility is adjacent to Springdale, Pa., the birthplace of conservationist Rachel Carson. Vitro's Technical Services department (PPG at the time) participated in an ABC study at the Powdermill Nature Reserve several years ago, just as the concept of bird glass was emerging. The company also has been a long-standing partner with Walker and its Avi-Protek product. The company's 2018 partnership with the National Aviary has also continued to pull Vitro in this direction.

Photo: Philip Castleton Photography

The Humber College Centre for Entrepreneurship in Toronto features AviProTek bird-friendly glass by Walker on tinted Solarban 70XL glass by Vitro Architectural Glass.

"... Our interest is to help architects create buildings in harmony with nature. I can't help but to think of the words of Frank Lloyd Wright, who did notable work in the Pittsburgh area, who said 'Study nature, love nature, stay close to nature. It will never fail you.' The connection to nature and the surrounding environment is what makes glass such a unique and useful building material. In my view, it's why we're here," says Struble.

www.vitroglazings.com

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Entice is also designed to support handle hardware—including tubular panic devices—on 1-inch insulating glass units using proprietary, through-glass fittings for a floating-on-air visual. The system is capable of handling emergency exit hardware loads during the UL emergency exit test.

www.crlaurence.com

glass railings

Booth #3925 — Taking Flight

Viewrail Flight is a complete floating stair system comprised of steel stringers for strength and support, thick wood treads for a modern look and a glass railing that makes the stairway appear to float in space. According to the company, the stairs can be built in any configuration, including straight runs, 90-degree turns and switchbacks. Wood treads are available in thicknesses up to 4 inches, in more than 20 species and with a selection of stain options. Glass railing options include standoff pins, talon spigots and surface- or side-mount posts. For horizontal railing runs, a base rail option is available.

www.viewrail.com

skylights

Booth #6016 — Presenting: Auburn in E+ Major

Major Industries will be highlighting its new Auburn E+ glass skylight system. Auburn E+ is the next step in the company's existing skylight line, and features a number of performance improvements, including a new thermal cap and a modern flush-glazed design. Low-E glass and insulating flashing are also available.

According to the company, it has improved its products by integrating new technology that it says helps isolate the outside environment from a building's occupants. The new system is tested to ASTM E283/330/331 standards, and features high-performance glass options, multiple finish options and numerous design configurations to provide architects choices for design freedom.

www.majorskylights.com

architectural metals

Booth #6416 — Metal in All Colors

Petersen Aluminum is highlighting three of its products at the show, including its Precision Series Highline S1 architectural wall panels, which the company says provide design flexibility by combining bold visual effects with easy, cost-effective installation. The Highline S1 profile is 1-$^{3}/_{8}$ inch deep, and can be paired with six other profiles in the Highline Series. The panels can be installed horizontally or vertically, and can also be specified as perforated in aluminum only for use in equipment screen applications or over graphics.

Petersen will also show its Snap-Clad panels that are leveled to provide flatness. These panels feature an optional factory-applied sealant bead for improved weather resistance. They are

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architectural metals

Booth #4845 — Putting on the MapeSpan

Mapes Industries will display its MapeSpan architectural panels, the company's solution for storefront and curtainwall applications. The single-source panels feature spandrel glass with ceramic frit on the number two surface as the exterior component. Coupled with an insulating core and a customizable interior, MapeSpan panels can be used by architects, contractors and installers to maintain the aesthetics of a glass exterior with higher R-values and a lower total cost than insulating glass units that are often used in similar applications.

The company encourages glaziers and architects to consider MapeSpan as a cost-effective alternative to using insulated backpans behind glass in spandrel areas.

www.mapespanels.com

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manufactured in a labor-saving, one-piece design, according to the company. Snap-Clad panels feature a 1-3/4-inch leg height and a continuous interlock for improved structural performance and wind resistance. A concealed-fastener clip system allows for thermal expansion/contraction while providing hold-down strength

Snap-Clad panels are available in Petersen's full color line in 45 standard colors that include a 30-year finish warranty.

Lastly, architects at AIA can expect to see the Precision Series Tiles collection, which includes four metal tile profiles that offer an alternative to roll-formed panel-style cladding. The stamped tiles can be applied to roof or wall installations, and are offered in four styles, including flat, cupped, diamond and TS. The tiles can be applied to either non-residential or residential environments, and are covered by the PAC-CLAD 30-year finish warranty. The metal tiles are available in a full 70% PVDF finish (Kynar) in 45 standard colors, 12 colors in LIC stainless and Zalmag.

www.pac-clad.com

fire-rated glass

Booth #7413 — A Clear 45 Minutes

SuperClear 45-HS-LI from Safti First is a clear fire-rated glazing product that meets all fire, hose stream and impact safety requirements for 45-minute doors, sidelites, transoms and openings. It is available in large sizes and can be used in interior and exterior applications including energy-efficient make-ups. SuperClear 45-HS-LI is UL and Intertek listed.

www.safti.com/superclear45

thermal barriers

Booth #5238 — The Thermal Option

Azon will display an optimized performance window featuring the Azo-Core, a high-density foam thermal barrier by Azon. The thermal barrier material has low conductivity, and paired with an expanded polyurethane core, it allows commercial glazing to meet stringent global energy standards, according to the company. Azo-Core can achieve a U-value of 0.25 in windows with insulating glass comprised of two low-E coatings, and even lower with triple glazing, through simulated testing.

www.azonintl.com

architectural metals

Booth #6325 — Helping You Formawall

Centria's flagship line of insulating metal panels, the Formawall High Performance Building Envelope System, combines design freedom with performance. All Formawall products include a standard halogen-free foam core, enabling architects to create a more sustainable building environment, while improving the product's fire performance, according to the company. Centria's Formavue windows are engineered and built as a fully integrated component of the Formawall system. They feature aluminum framing that incorporates a complete thermal break, integral head and sill joinery for what the company calls seamless pairing with Formawall panels.

www.centria.com

blinds

Booth #4507 — Between the Glass

Intigral will showcase custom manufactured blinds housed between the glass. The company offers custom blinds between the glass for both residential windows and commercial applications. The products range from tilt-only venetian blinds to fully motorized roller shades. Intigral is the only authorized ScreenLine manufacturer in the U.S., and manufactures the entire compliment of products at its

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facility in Twinsburg, Ohio, according to the company. ScreenLine integrated blind models include Venetian, pleated and roller blinds in six blind control systems and 48 color combinations.

www.intigral.com

Is Your Project the Pinnacle of Glass in Architecture?

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Whether high-rise, low-rise, interior or specialty construction, the world is full of astounding architecture that uses glass as a dominant design component. Now, the time has come to acknowledge these impressive works.

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Rules and Eligibility

- Interior or exterior architectural glazing project submissions must have been completed since January 2018;
- Projects located throughout the world are eligible for entry;
- Submissions must feature architectural glazing prominently within the design;
- Submissions must include up to five high-resolution (300 dpi) images;
- Submissions, including all images, must be approved for publication by project owner, and you must have the rights to use the images for editorial purposes;
- To maintain anonymity in judging, the names of entrants or collaborating parties will not appear on any submission materials provided to judges; and
- Entry forms must be completed in their entirety.

To Enter

The entry form is available online at usglassmag.com/designawards and is due by August 15, 2019. If you have questions about the awards, please contact Ellen Rogers at erogers@glass.com or call 540/602-3249.

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Anthony Cinnamon
Wiss, Janney Elstner Associates Inc.

Anthony Cinnamon is a licensed architect and associate principal with the Wiss, Janney Elstner Chicago office, where his expertise lies in the investigation of windows, curtainwalls and exterior wall systems. Cinnamon has written articles on the inspection, repair and replacement of window and curtainwall systems and has presented seminars domestically and internationally on fenestration topics including glass failures and testing and repair of window and curtainwall systems. He is on the board of directors of the National Fenestration Rating Council and is the past chair of the Chicago chapter of the Building Enclosure Council.

Richard Green
Front Inc.

Richard Green has been a global façade specialist for more than 30 years covering a wide range of building types, and has experience with curtainwall, glass walls, tension structures and more. He is a Front Inc. principal and global technical director and has a design passion and engineering expertise to enable some of the finest architects in fulfilling their visions. An international glass design expert and technical chair for ASTM's Structural Glass Committee, he also participated in forming Australia's Glass Standard (AS-1288), the ASTM Window Glass Standard (E-1300) and participated in Eurocode 11 for Structural Glass Design. He currently represents the U.S. on ISO committees. He is a licensed professional engineer in Washington and Texas.

James O'Callaghan
Eckersley O'Callaghan Engineers

James O'Callaghan, co-founder of Eckersley O'Callaghan, is a structural and facade engineer with more than 20 years of experience. He is well-known for his highly innovative designs of glass envelopes, stairs, bridges and other structural elements in Apple's iconic retail stores around the world. He has taught at the University of Portsmouth and is currently a visiting professor at the TU Delft School of Architecture. In 2016, he received the Milne Medal from the International Association of Bridges and Structures for Excellence in Structural Design, and in 2017 he received the Phoenix Award for his contributions to structural glass. In 2018, he was elected as a Fellow of the Royal Academy of Engineering, and in 2019 was awarded the IStructE Gold Medal.

Mic Patterson
Ambassador of Innovation & Collaboration, Façade Tectonics Institute

Mic Patterson, founder, officer and board member of the Facade Tectonics Institute, is a designer, researcher, educator, futurist, author, photographer and entrepreneur. He has concentrated his professional and academic career on advanced facade technology and sustainable building practices. He is also a lecturer at the University of Southern California School of Architecture, and is on the technical research committee for GlassCon Global and a former member of the Advisor Group for the Council for Tall Buildings and Urban Habitat. He is the author of Structural Glass Façades and Enclosures (Wiley).

Deadlines

Submissions will be due by August 15, 2019 and announced in the January 2020 issue of **USG**lass magazine.

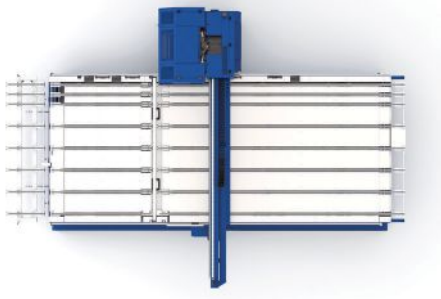
Entry Fee
$55 (no refunds will be given)

Criteria
Submissions should illustrate the following:
- Design innovation;
- Aesthetic achievements; and
- Technical difficulty.

Categories
- Low- to Mid-Rise Construction (under 75 feet)
- High-Rise Construction (more than 75 feet)
- Commercial Interiors (podium, lobby spaces, etc.)
- Specialty Construction

decorative glass
Machinery Expansion

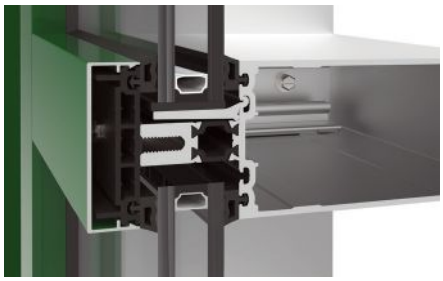
TBM Glass recently added a Tecglass digital printing line to its range of glass fabrication capabilities. The Tecglass machine digitally prints ceramic ink using 24 print heads achieving 1,440 dpi resolution. The company's manu-



facturing facility in Santa Ana, Calif., is equipped with a variety of machines including a 5-Axis CNC, 3-Axis CNC, Vertical CNC, vertical edging, beveling, lamination line (enclosed in clean room environment), autoclave, tempering line and now a digital printing machine. The company's architectural division manufactures glass for architects, designers, installers and artists, offering them unique solutions to their most challenging projects worldwide, according to the company. Fabricated products include glass from $^{3}/_{32}$-inch to 1-inch thick in a wide range of colors, and finished products up to 150 inches.

www.tbmglass.com

components
Under Pressure



Technoform's polyamide pressure plate increases the thermal performance of most traditional aluminum pressure-glazed systems. Designed for new construction or existing systems utilizing a 2- or 2.5-inch wide pressure plate, this solution has yielded performance increases of up to a 20% gain in U-factor and a 10% gain in condensation resistance. Best-in-class systems can achieve thermal performance with U-factors as low as 0.17 Btu/hr.ft2.F. The polyamide pressure plate is UV stable and easy to cut or drill onsite. It is an alternative to fiberglass products that require special handling and equipment during fabrication. Orders can be produced to specific lengths and pre-drilled to reduce time and maintain consistent quality. Replacing the aluminum plate will improve the energy performance of the façade while accommodating a variety of manufacturer-supplied exterior covers to address various project-specific requirements, according to the company.

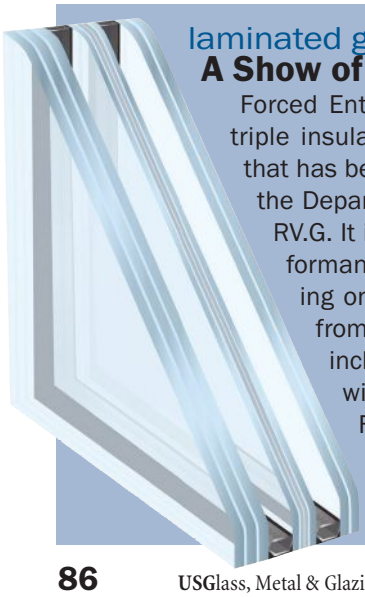
www.technoform.com

spacers
Design Flexibility

The Ködispace 4SG reactive thermoplastic warm-edge spacer offers unlimited insulating glass unit shapes and design, thermal performance and maximum gas tightness, according to the company. As a permanently flexible spacer, its high elasticity and chemical bonding result in better mechanical performance during environmental changes. During expansion and compression cycling of the 4SG unit, stress is extended over the full spacer width and not concentrated only on the edges, helping improve gas tightness and energy efficiency, according to the company.

www.hbfuller.com/4SG

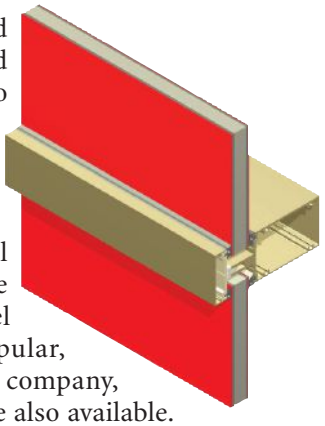
laminated glass
A Show of Strength



Forced Entry/Ballistic Resistant (FE/BR) from Viracon is a triple insulating glass-clad polycarbonate laminate makeup that has been tested as part of a complete glazing system to the Department of State FE/BR test method SD-STD-01.01 RV.G. It is available with the options of adding a solar performance coating as well as digital or silk-screen printing on the number two surface. It is available in sizes from 24 inches by 24 inches up to 60 inches by 108 inches. It's possible to substitute the interior laminate with Viracon's CyberShield laminate to meet ASTM F3057—Standard Test Method for Electromagnetic Shielding Effectiveness of Glazings.

www.viracon.com

architectural metals
Architectural Aesthetics



Quality Metalcrafts/Americlad provides insulated infill panels to glaze into storefront or curtainwall to provide an attractive architectural metal look. Although the 1-inch thick panel is the most popular, according to the company, other thickness are also available. The company offers a wide selection of

standard and custom finishes. A variety of insulation cores or custom configurations are available. This includes the flush glaze panel which flushes out with the curtainwall system, or the rabbet edge where high insulation values can be easily achieved.

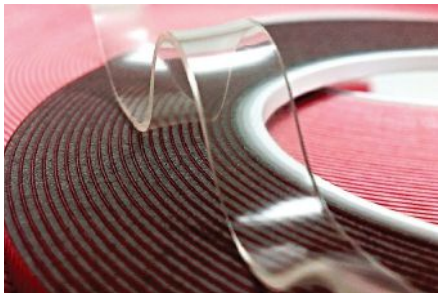
www.americlad.com

lifting and handling equipment
A Modern-Day Lifter

SmartLift's SL408HL is specially designed for the modern-day glazier. Requiring no hydraulics for operation, it provides the glazier with $^{1}/_{64}$-inch movements. All SmartLift models come standard with a remote control, outriggers and 5 inches of total side shift. SmartLift mobile manipulators are providing glaziers with a tool to eliminate lifting on the job or in the shop, according to the company.

www.smartliftus.com

tapes
An Ultra Tape



Capital Tape now offers a wide range of product offerings in the 4700 series of Ultra High Bond Acrylic tapes, according to the company. These products feature high-level weathering properties and are resistant to UV-rays, heat, humidity and chemicals. Typical applications include cladding, muntin/SDL bars, truck body manufacturing, boat and RV building, sign mounting and fabrication, trim attachments in vehicles, furniture and buildings, and nameplate mounting.

www.capitaltape.com

transportation
A Rolling Billboard

All MyGlassTruck curtain-side glass trucks and trailers are now available with full coverage digitally printed curtains in full color. Companies can now leverage their glass trucks as rolling billboards, turning every delivery run into an advertising opportunity, according to the company. Designs may feature photos, illustrations and graphics. Constructed from double-weave polyester and reinforced around the wheels, MyGlassTruck curtains are durable and flexible under harsh conditions. Each curtain slides smoothly on ball bearing rollers in a one-piece aluminum track and features quick release buckles and ratcheting front and rear tensioners for fast opening and closing.

www.myglasstruck.com

decorative glass
Building with Pyramids

Nathan Allan's newly created Pyramid Glass, is designed for large scale façade applications. With panels available up to 6 feet 6 inches by 11 feet, Pyramid Glass can cover an entire wall. Available in 15 pearlescent colors, Nathan Allan's Pyramid Glass can be installed against other wall materials, for front side viewing only, or, when used as a partition, Pyramid Glass can also be viewed from both sides.

www.nathanallan.com

tools
Drip Control

Strybuc now offers Irion America's eXcePt310 "Drip Control" caulk gun which features a rubber-coated handle and trigger, anti-rust/scratch-proof barrel and built-in tip cutter. At a 19:1 thrust ratio, it dispenses various materials easily and is ideal for trade professionals, according to the company. The adjustable drip control technology can be activated by a switch on the handle. It can be ordered as Part #59-163.

www.strybuc.com

NewsMakers

comings and goings

Steve Morren

After more than 40 years in the glass business, with the last five years spent as director of architectural services at Walker Glass, **Steve Morren** has announced that he will retire effective December 31, 2019.

Morren kicked off his career with PPG (formerly Canadian Pittsburg Ind.) in 1978 and then joined Walker from 1982 to 1989 as a sales representative. From there, he went on to Fulton Windows in various sales roles. In 1995, Morren was named president of Eastern Float Glass where he led the company's growth for more than ten years. Prior to re-joining Walker in 2014, Morren held a leadership position as vice president and general manager with Triple Seal Ltd.

Morren will remain active through the end of 2019, mentoring Walker's architectural team and working with architects, fabricators and glaziers on numerous Walker-specified projects, notably the company's AviProtek line of bird friendly products.

Steve Green

promotions

Tubelite Inc. has promoted **Steve Green** to the role of president. Green will report to Joe Puishys, chief executive officer of Apogee Enterprises Inc., Tubelite's parent company.

As president, Green oversees the company's operations and its facilities in Walker and Reed City, Mich.; Dallas; and Warwick, R.I.

Green began his career at Tubelite as a sales representative in 1990 and was promoted to regional general manager after his first year with the company. In the following years, he became the vice president of sales and was co-owner of the company before Apogee purchased Tubelite in 2007. In 2018, he was named general manager.

appointments

Mark Spoorenberg has been appointed chief operating officer of Vitrum Glass Group. Spoorenberg's leadership and operational experience spans more than 15 years with large multi-national companies.

Prior to joining Vitrum Glass Group, he acted as COO

obituaries

Martin Zawatsky

Martin "Marty" Zawatsky, former owner of multiple glass companies throughout New England, passed away peacefully on April 1, 2019. He was 89 years old. Zawatsky owned Shoor-Elias Glass (SEGCO) and Merit Glass in Rhode Island, as well as Northeast Glass and Aluminum with three locations in New Hampshire.

Zawatsky and his team grew SEGCO into the 28th largest contract glazing company in the U.S. (**USG**lass, April 1996) before selling his portfolio of glazing, fabrication and erection companies to Karas and Karas of Boston.

Zawatsky grew up in the glass business, installing storefront in the 30s, 40s and early 50s with his father. He was a third generation glazier who applied his field experience to solving complex building enclosure challenges. Zawatsky authored numerous technical articles and was a visionary within the architectural glass and metal industry, developing systems to pre-glaze, deliver, hoist and install ribbon window units with great efficiency. He was also at the forefront of union/owner relations, finding common ground and developing positive long-term relationships with organized labor for the benefit of all, according to his obituary.

He was the son of Sarah and Julius Zawatsky of Providence, R.I., and is survived by his wife of 66 years, Hope Pritsker Zawatsky; their three sons, Jay, Paul and Marc; eight grandsons; two granddaughters and three great grandchildren. He is also survived by his sister, Leona Spilka.

Vick Channel

Vick Channel passed away unexpectedly on Sunday, March 24, 2019 at the age of 62. During the 40-plus years of his career Channel worked with several automotive glass companies, including Safelite, Southern States Glass and Libbey Owens Ford before transitioning to the architectural glass side of the industry at Harding Glass. Since then he worked for Gardner Glass Products, Glas-Tech Industries, Summit Glass Coatings, Shape Products and, most recently, Trulite.

Channel is survived by his wife of 42 years, Lisa; daughter, Carissa (Channel) Moening; son, Eric Channel; and eight grandchildren.

"He was loved and respected by many throughout the glass industry. I would like to thank everyone who has reached out to my family ... Your thoughts, prayers and kind words are sincerely appreciated," said his son Eric, who is the president and CEO of Global Glass Solutions. "He was deeply loved by his family, friends and co-workers."

Mark Spoorenberg

for Clearly.ca. As COO, Spoorenberg implemented and met many operational challenges during a period of accelerated growth, according to Vitrum. He also spent four years as senior operations manager with Amazon, where he drove quality and process change initiatives leading to many plant efficiencies.

Spoorenberg will report directly to Thomas Martini, president, and Gemma Martini, CEO of Vitrum Glass Group. Moving forward all branches and departments will report to Spoorenberg, which will allow the executive team to remain focused on growth opportunities and broader strategic planning, according to the company.

Marco Schiavon has been appointed CEO of Forel North America. As CEO, Schiavon will oversee the operations at the St. Paul, Minn., and Toronto, Ontario locations.

Schiavon has been employed at Forel for more than 30

continued on page 90

Marco Schiavon

years and has gained extensive experience in the glass industry, according to the company. During his career, he has held various positions of responsibility within the organization, and has extensive experience within the North American market.

kudos

Structures Unlimited Inc. has named **Tofee Shamatta** as its 2018 Salesperson of the Year.

Shamatta joined the company and its strategic partner, Kalwall Corp., in 2016 as sales representative for most of eastern Massachusetts including Boston, the South Shore, Cape Cod and the islands of Nantucket and Martha's Vineyard.

Tofee Shamatta

"Tofee's understanding of the region and the relationships he built in the industry have boosted our sales in eastern Massachusetts," says Mark McNichol, director of sales for Structures Unlimited.

Kalwall Corp. recognized **Steve Del Guercio** with its 2018 Salesperson of the Year award. It was the ninth time he has been honored as the top sales producer for the diffused natural daylighting solutions company.

Del Guercio, Kalwall's sales representative for New Jersey, has been with the company since 1999. He has also been recognized as Salesperson of the Year three times for Structures Unlimited.

"Steve is a passionate and dedicated leader in our sales force," says Jim Andrus, Kalwall's vice president of sales in North America. "His understanding of Kalwall products continues to help him build and sustain relationships in the region."

associations

During the American Architectural Manufacturers Association (AAMA) 82nd Annual Conference in February, **Donnie Hunter**, director of global product management for Kawneer, was recognized as the new chairperson of the board of directors. Hunter takes on this role following a two-year term led by outgoing chairperson Mike DeSoto, chief operating officer for MI Windows and Doors.

Additionally, **Janice Yglesias** was named executive director of the association. Yglesias has served AAMA for 20 years and previously held many positions within the organization, most recently executive vice president.

The National Fenestration Rating Council (NFRC) added two members to the 2019 board of directors during its spring committee meeting in Baltimore.

Anthony Cinnamon, principal at Wiss, Janney, Elstner Associates Inc., and **Lisa Winckler**, director at Eastman Chemical Co., joined the NFRC board.

These individuals will fill one new fenestration industry/unspecified seat and one at-large seat. The new fenestration industry/unspecific board member will serve until the board election in the fall, at which point they could be reappointed. Since 1995, Cinnamon has worked in inspections and investigations of building facades, exterior wall systems and fenestration systems. His current work with Wiss, Janney, Elstner Associates Inc. covers high-rise residential and office buildings, institutions, sports arenas and historic structures.

Winckler is director of product management and industry affairs for Eastman Chemical Co., performance films. She has nearly 30 years of experience in the window film industry in the areas of quality, technical marketing, product management, product development and research. ■

Reviews&Previews

GPAD Conference Focuses on Industry 4.0 in San Antonio

Automation is a growing trend within the glass industry as companies look to improve efficiencies and reduce labor costs. Presenters at the 2019 Glass Processing Automation Days (GPAD) Conference, held in San Antonio during March, focused on trends in automation.

Ron Crowl, president and CEO of FeneTech, and Horst Mertes, vice president of sales and marketing at FeneTech and CEO of FeneTech Europe, welcomed attendees by framing automation and Industry 4.0 in the context of the glass industry.

"We believe that only by closing the gap between software and machinery can you eliminate islands of automation and an efficient work flow can be achieved," said Crowl.

Dave Miller, business development, glass fabrication North America for FeneTech, continued the focus on automation in his presentation, "This is Where the Digital Factory Begins." He explained that enterprise resource planning (ERP) systems shouldn't be used solely to push data to the individual work cell but to get information back from those systems.

"We want to know when units are complete and what the status is so we'll know if we will have the work orders done on time," said Miller.

Terry Hessom, vice president of operations at HHH Tempering Resources, spoke about how automation minimizes downtime in the presentation, "Minimizing Downtime During the Automation Age." He began by pointing out that, on average, manufacturers lose 800 hours each year due to downtime. Downtime impacts a company's equipment and labor costs.

Terry Hessom, vice president of operations at HHH Tempering Resources, speaks about how automation minimizes downtime.

"You're paying people for a lack of productivity during that downtime," said Hessom.

Companies also pay for reallocated management time and for the production supervisor and quality control manager to focus on fixing the problem rather than production. Downtime also puts stress on personnel and has other hidden costs.

"When a company's focus is on fixing machinery they're not focused on innovation," said Hessom. "A potential loss in customer trust is another hidden cost."

He stressed the importance of management buying into the strategy of scheduling downtime and using automation systems to identify preventative maintenance needs to mitigate unscheduled and costly downtime.

"Invest in training tailored to each team member," said Hessom. "Train for machine-specific troubleshooting and maintenance and cross-train to reduce wasted labor costs."

He also suggested that companies use the data provided by their machines to analyze what's improving and what hasn't in the production process.

Doug Mangus, machine sales director and owner of Salem Flat Glass & Mirror, highlighted the benefits of robotics using the Bovone Robotic System (BRS) as an example. He explained that robots move exactly the same every time based on the information input into the machine.

"Everything is handled precisely which reduces risk," said Mangus. "All of the work cell is contained by safety barriers. Operators are not allowed in there when producing glass. The risk of handling, dropping pieces, loading and unloading risks are gone, which is a huge benefit."

The reduction in safety risks also reduces insurance claims from repetitive motion or accidents.

During Forel's presentation about high-speed insulating lines combined with sorting systems, sales director Marco Schiavon and U.S. service and parts manager Troy Lentner discussed the benefits of high-speed production.

"Every facility I talk to says they're 25 short," said Lentner. "With high-speed lines we now have three people working the line."

He said that using these automated lines reduces the direct costs of labor, including payroll, taxes and benefits.

Schiavon and Lentner also said that combining a high-speed automated system with a sorting system results in less waste and saved time because people don't have to go looking for specific glass remnants.

Up&Coming

2019

June 6-8
AIA Conference on Architecture 2019
Sponsored by AIA
Las Vegas Convention Center
Las Vegas
More info: www.conferenceonarchitecture.com

June 11-13
Glasstech Mexico
Sponsored by Y T international Enterprise Inc.
Centro Citibanamex
Mexico City
More info: www.glasstechmexico.com

June 17-20
2019 IGMA Summer Conference
Sponsored by IGMA
Fairmont Empress
Victoria, British Columbia
More info: www.igmaonline.org

June 26-28
GPD Finland 2019
Sponsored by Glass Performance Days
Tampere Exhibition and Sports Centre
Tampere, Finland
More info: www.gpd.fi

August 12-15
Fall Conference
Sponsored by NGA/GANA
Renaissance Toledo Downtown Hotel
Toledo, Ohio
More info: www.glasswebsite.com

September 5
Architects (Window) Film Forum™
Sponsored by Window Film™ and *Architects' Guide to Glass & Metal* magazines
Indiana Convention Center
Indianapolis
More info: www.glassguides.com/filmforum

September 4-6
International Window Film Conference and Tint-Off™ 2019
Sponsored by Window Film™ and PPF magazines
Indiana Convention Center
Indianapolis
More info: www.wfctevent.com

September 4-6
Auto Glass Week™ 2019
Sponsored by Auto Glass Safety Council™, Independent Glass Association, National Windshield Repair Division and **AGRR**™ magazine
Indiana Convention Center
Indianapolis
More info: www.autoglassweek.com

September 12-13
Aluminum USA
Sponsored by the Aluminum Association and Aluminum Extruders Council
Music City Center
Nashville, Tenn.
More info: www.aluminum-us.com

September 17-19
GlassBuild America
Sponsored by NGA/GANA, AAMA and IGMA
Georgia World Congress Center
Atlanta
More info: www.glassbuildamerica.com

October 1-4
Vitrum 2019
Sponsored by GIMAV
Fiera Milano
Milan, Italy
More info: www.vitrum-milano.com/en

November 12-14
IG Fabricators Workshop
Sponsored by IGMA
Intertek Testing Services
Plano, Texas
More info: www.igmaonline.org

November 20-22
Greenbuild 2019
Sponsored by the U.S. Green Building Council
Georgia World Congress Center
Atlanta
More info: www.greenbuildexpo.com

December 4-5
Glass Expo West™ '19
Sponsored by **USG**lass magazine, USGNN.com™ and *Architects' Guide to Glass & Metal* magazine
San Diego Convention Center
San Diego
More info: www.glassexpowest.com ■

To see the full event schedule or add your own events, visit www.usglassmag.com/events.php.

theBusiness

continued from page 100

the monitor from my arm. "I can't take any more."

She smiled … a sly, wicked little smile.

"Mr. Hill, you lasted a little longer than most. Some of the younger guys hang in a little longer but, for the most part, you glass and metal contractors are all alike ... a bunch of beaten-down, weak-kneed wimps."

I was embarrassed. I had never been turned down as a blood donor before. But then again, I'd never been hit with questions relating to what I did for a living. It was all unfair somehow. I just wanted to do my part.

"Has anyone associated with the glazing trade ever made it?" I asked.

"Oh, yeah. The metal suppliers sail right through. No blood pressure problems, no sleepless nights and no apparent concerns of any kind. In fact, nothing seems to bother those guys."

"Well, Nurse, I'm sorry I won't be able to donate today, but can I ask you for a favor that would go a long way toward helping me with my apparent blood-pressure problem?"

"Sure, what is it, Mr. Hill?"

"The next metal supplier guy that comes along, can I be the one to stick the needle in? You know, so I can at least say that I did my part." ■

ADHESIVES/SEALANTS

Adhesives, General

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info@glasswerks.com

PRL Glass
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Industry, CA 91746
P: 800/433-7044 F: 626/968-9256

Burglar-Resistant Glass

Ray-Bar Engineering Corp
697 W. Foothill Blvd.
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www.raybar.com
sales@raybar.com

Curved/Bent

Curved Glass Creations
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www.curvedglasscreations.com
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F: 800/543-8798 or 479/996-8962
www.e-bentglass.com
sales@e-bentglass.com

Film Covered Wire

SAFTI*FIRST*™ Fire Rated Glazing Solutions
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www.generalglass.com

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Technical Glass Products (TGP)
8107 Bracken Place SE
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P: 800/426-0279 F: 800/451-9857
www.fireglass.com

Vetrotech Saint-Gobain
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Auburn, WA 98001
P: 888/803-9533
www.vetrotechusa.com

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Hurricane-Resistant

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Snoqualmie, WA 98065
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www.fireglass.com

Laminated

Precision Glass Bending Corp.
PO Box 1970, 3811 Hwy 10 West
Greenwood, AR 72936-1970
P: 800/543-8796 or 479/996-8065
F: 800/543-8798 or 479/996-8962
www.e-bentglass.com
sales@e-bentglass.com

Laminated/Fire-Rated Wire

Technical Glass Products (TGP)
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Snoqualmie, WA 98065
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www.fireglass.com

Patterned Glass

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Radiation Shielding

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Issue@Hand *continued from page 6*

> *"You can imagine why. There's glass everywhere. You know, everything that they do to keep them [buildings] hot or cold just goes right out through the glass, so they have to pump more and more energy to keep them at a certain level. So [it's] an idea that doesn't make sense anymore."*

> *"We're talking about getting rid of glass and steel skyscrapers that were made—bluntly—in a very backward way that really harmed the environment."*

> *"That's why I say it's a ban. You literally will not be physically allowed to build the kind of buildings that have gone up even recently in this town."*

There are numerous other comments in the press. Oh, and as an example of the "wrong way to do things," de Blasio cited the new Hudson Yards development, which our own Ellen Rogers has reminded me, already has one building (Tower 10) that's certified LEED Platinum.

The mayor did not take his wrath out on HVAC systems, lighting, brick nor concrete jungles that capture heat, nor on any other building material. Nor did he address other possible causes such as spec developments nor rent-controlled buildings. No, his speech was a rousing insult—a Bronx cheer if you will—to glass. I have now also had a chance to read the proposed legislation. It is rather amorphous. (If you are interested I dissect it more in my blog at http:/deblog.usglassmag.com.) Those who wish to deny any prejudice against our beloved material are quick to point out the legislation does not specifically address, or even name, glass. To my mind that's worse. While the reality of the legislation is energy-efficiency as a solution, the perception of the press conference is glass as the problem. Fixing the legislation doesn't fix the perception.

Excerpts of the conference were covered in almost every major market in the country. In one New York minute, Bill D. has made it not only okay, but "politically correct" to come after the most majestic of all materials. The opening bell has sounded. We've got a lot of work to do. ■

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I Just Wanted To Do My Part

by Lyle R. Hill

Sometimes knowing what to do and having the courage to do it is not all that difficult. Quite often, doing the right thing is a relatively easy thing. But that doesn't make it any less right … any less important …. or any less needed.

I knew about the problem—about the shortage. I'd heard about it on the radio, read about it in the newspaper. Then, I received a personalized invitation from a local subcontractor's association to help do something about it. They were trying to get anybody and everybody associated with the construction industry involved. Naturally, I accepted, because it was the right thing to do, because it would be an easy thing to do and because I just wanted to do my part.

I arrived at the blood donation center at the appointed time and signed in. It only took a few minutes to fill out the required forms and then, after my temperature was taken and determined to be within an acceptable range, I was assigned a chair in the staging area and told to go to station number six, the one marked "Glazing & Metal Contractors." I was to wait there until the nurse called for me.

I couldn't help but notice that each trade had its own designated table. The electricians were doing a brisk business and so were the HVAC guys. The plumbers' table … a messy, dirty thing with a puddle of water underneath it, seemed to be keeping busy as well. I was happy to see that our industry had gotten behind the call to help overcome the short supply of whole blood in this area. After a moment or two, I started up a conversation with the dejected looking guy sitting next to me.

"So," I began, "I take it you're here to donate blood. What trade group are you with?"

"I'm a roofer," he replied, "but they've rejected me because of my illness."

"Really? You look okay to me," I stated. "What's wrong with you?"

"Bad case of shingles," he answered.

NOTE TO READERS: I'm sorry. I know that as readers of this column you have come to expect sophisticated humor, contemplative antidotes and witty repartee … not cheap puns or slip-shod innuendo. I got carried away … it was too easy. It won't happen again. Now back to the story.

The nurse at station number six made eye contact with me and, by way of a sweeping up-and-down nod, let me know that I was to join her. After I sat down, she quickly strapped a blood pressure cuff to my left arm and pumped it up. She looked at my previously completed form, glanced at the pressure monitor and frowned.

"Okay, Mr. Hill," she began, "Your blood pressure is a bit on the high side so I just have to ask you a simple series of questions while observing your blood pressure readings. If all goes well, we'll get you on your way in no time. So are you ready?"

"Yes, I am," I replied cheerfully.

"All right then, Mr. Hill. My first question is this: do you ever suffer from night sweats . . . particularly on the night before a large bid is due and the quotation you are issuing has been put together with incomplete information and in an inadequate amount of time for proper preparation?"

"Well, sometimes," I answered, sensing that a bit of perspiration was gathering on my forehead.

She looked at the monitor, shook her head ever so slightly and then looked back at the sheet of paper in front of her.

"Question number two, Mr. Hill. Have you ever experienced a nervous twitch while dealing with an architect, particularly when they are pounding you with an endless series of ridiculous, elementary, senseless questions about a job you will probably never even get a chance to bid?"

"Yes. Yes I have," I replied, hoping that she did not notice the uncontrollable blinking that had now started with my left eyelid.

"And Mr. Hill, does the twitching worsen into uncontrollable shaking when that same architect asks you to provide budget pricing based on a drawing that is the equivalent of what your 8-year old grandson could produce if given the opportunity?"

Now both eyelids were out of control. The sweat was dripping from my forehead and my right hand was flopping about on the table in front of the nurse. I think she was enjoying this. She relieved some of the pressure on the arm cuff and tapped her monitor twice as if questioning the reading she was getting.

"What about your collection efforts with general contractors, Mr. Hill?" she continued before I could even answer the last question. "Do you suffer from anxiety, nausea or depression when trying to collect what is owed to you? And here's the clincher, Mr. Hill. How do you feel when I mention the word retention?"

"Stop!" I screamed, while ripping

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the author

Lyle R. Hill is the managing director of Keytech North America, a company providing research and technical services for the glass and metal industry. He also serves as president of Glass.com, an information portal and job generation company for the glass industry. Hill has more than 40 years' experience in the glass and metal industry and can be reached at lhill@glass.com.

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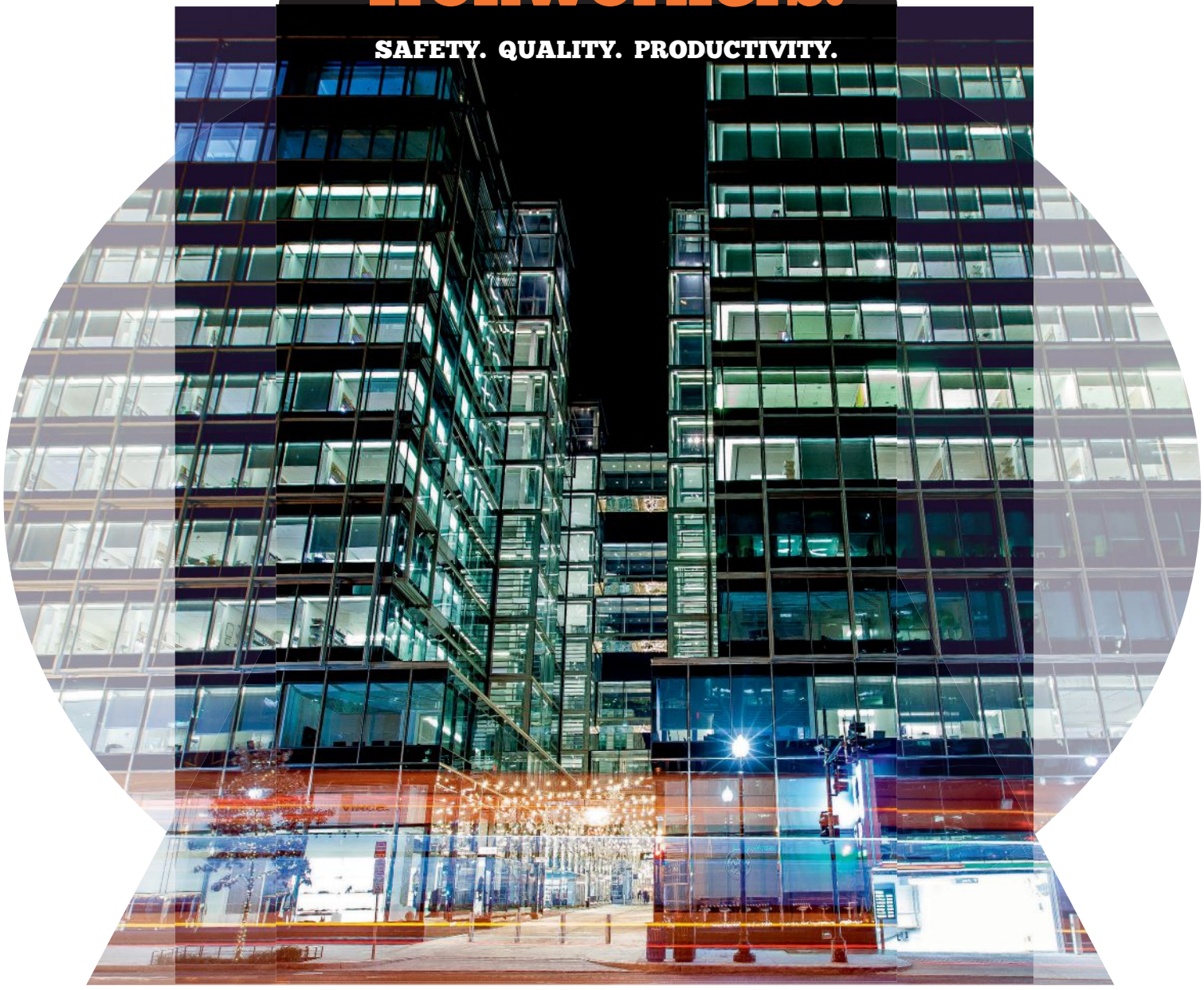

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