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On the cover: The exhibit floor at the 2017 GlassBuild America: The Glass, Window & Door Expo in Atlanta. The preeminent trade show for the glass and fenestration industries comes to the Las Vegas Convention Center Sept. 12-14. Learn more about the product innovations on display, the exhibitors and the schedule of events beginning on page 40. Photo by Robb Cohen Photography & Video, robbsphotos.com.
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CRH to Establish New Global Building Products Division
CRH plc, crhamericas.com, parent company of Oldcastle BuildingEnvelope, obe.com, will establish a new global building products division effective Jan. 1, 2019, bringing together its Europe Lightside, Europe Distribution and Americas Products divisions. Under the leadership of Keith Haas, president, Americas Products, the new platform will operate alongside the company’s Americas Materials and Europe Materials divisions. David Dillon, president, Europe Lightside & Distribution, will assume the new role of president, global strategy and business development, reporting to the CEO.

NSG to Build New U.S. Float Plant for Solar Market
Officials from NSG Group, nsg.com, announced that the company will invest nearly $350 million to expand production capacity of transparent conductive oxide coated glass for the solar market. The investment will fund the construction of a new float glass production facility in the United States, and the upgrade and restart of a currently dormant float line in Vietnam, to take place in the next three years.

The company has not yet finalized the location of the new plant in the United States, according to Richard Altman, regional director, Architectural Glass North America.

Arcadia Inc. Acquires Metal Window Corp.
Arcadia Inc., arcadiainc.com, acquired the assets of Metal Window Corp., metalwindowcorp.com, a southern California-based manufacturer of aluminum window and door products. The company reports that the acquisition will expand and enhance the capabilities of Arcadia’s residential division, Arcadia Custom, allowing Arcadia Custom to better serve its luxury home market. Arcadia Custom will continue to offer MWC’s products along with its thermal aluminum, thermal steel and wood window and door solutions.

Saint-Gobain and Sika End Dispute after 3-year Legal Standoff
In December 2014, officials from Saint-Gobain, saint-gobain.com, announced it acquired a controlling interest in Sika, sika.com, for $2.8 billion. Saint-Gobain purchased the controlling
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News to Know

Two Arrested in Glass Machinery Fraud Case
According to reporting by the Post Star, two individuals have been arrested in Queensbury, New York, and charged with fraud in connection with their glass-handling machinery business. Authorities have charged Robert J. Mirel and Deborah Burnett with 29 felonies each, alleging that the couple defrauded over 40 clients by taking money for machinery that was never delivered.

Almost 550 People Join Class-Action Suit Against Fuyao
The Dayton Daily News reported that 548 current and former employees of Fuyao Glass America, fuyaousa.com, have joined the class-action lawsuit against the company. The suit was originally filed by Julia Staggs, a former employee, who alleged violations regarding wages and scheduling.

Chinese Research Institute Produces Ultra-thin Float Glass
Chinadaily.com reports that Bengbu Design and Research Institute for the Glass Industry, located in the Anhui province of China, has produced the thinnest float glass in the world that remains flexible with high light transmittance. The float glass measures 0.12 millimeters thick.

Xinyi Glass Canada Ltd. Submits Bylaw Amendments for New Canadian Float Plant
According to reporting from The Wellington Advertiser, Xinyi Canada Glass Ltd., xinyiglass.ca, submitted an application for a zoning bylaw amendment to the municipality where it plans to build its first North American float glass plant, in Guelph-Eramosa, Ontario, Canada. One of Xinyi’s proposed amendments asks that a caretaker, emergency personnel and some staff be able to reside onsite.

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Xinyi met with local residents earlier in the year to discuss the planned $450-million factory.

AmesburyTruth Patent Infringement Lawsuit Against Vision Industries Ends in Settlement


*From April 13, 2018, to press time, June 25, 2018. To read these stories, and others, in their entirety, visit GlassMagazine.com.

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In March, President Trump signed an order that imposed a 25 percent steel tariff and a 10 percent aluminum tariff on imports from most U.S. trading partners. As of June 1, that list of affected trading partners includes Mexico, the European Union and Canada. (Canada represented almost half of the United States’ imported aluminum in 2017, according to the U.S. Geological Survey, minerals.usgs.gov.)

Aluminum and construction industry officials are critical of the measures’ intended economic benefit, and uncertain about their ultimate impact on material costs, the supply chain and the health of the overall economy.

“We can’t build the case that [the imposition of tariffs] is good for business; it’s not going to build our economy,” says Jeff Henderson, president, Aluminum Extruders Council, aec.org. “It feels like it’s going to be disruptive.”

The most recent measures, which imposed a tariff of 10 percent on imported aluminum products from the three geographic regions, are the latest of the restrictions placed on foreign metal imports. On March 8, President Trump issued the initial proclamations, which imposed duties on steel and aluminum articles under Section 232 of the Trade Expansion Act. The actions were based on a report from the Secretary of Commerce which argued that the amount of imported aluminum and steel “[threatened] to impair the national security.”

As of June 1, Argentina and Australia have been exempted from aluminum tariffs, but Argentina’s imports are subject to absolute quotas.

Industry sources interviewed after the imposition of tariffs on Canada, Mexico and the European Union say that the tariffs themselves do not seem to have affected aluminum supply thus far. Part of this is due to a strong construction market pre-tariff, says Michael Collins, managing director, Building Industry Advisors, buildingia.com, speaking in a June 15 interview. He says he has not heard of anyone short of aluminum, and building is still booming. “The benefit of the tax cut has likely outweighed the negative of the tariffs at the current moment,” he says. Collins also cautions that the full impact on construction will not be known immediately. “Massive capital decisions aren’t made in the short term. It’s going to be a number of months before you know the impacts,” he says.

While supply has not changed, rising costs have affected profitability, says Collins. Speaking to Glass Magazine on June 14, Jean Simard, president, Aluminium Association of Canada, aluminium.ca, warns that as those material costs rise, they will trickle down the supply chain. Simard says that small and medium businesses in both America and Canada are seeing costs increase since the tariffs have been imposed, and that as cost is passed down, buyers are more likely to outsource parts from a foreign supplier.

In a June 11 interview, Oliver Stepe, president, YKK AP America, ykkap.com, confirmed that rising costs were concerning downstream customers, but like Collins, warns against coming to any fast conclusions. “It is too early to determine the full scope of impact on the construction market stem-
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Closer Look

Aluminum Organizations Eye Threat of Chinese Overcapacity

A top concern over aluminum supply on a global scale is overcapacity of aluminum products in China, according to industry officials. National aluminum associations of the United States and Canada have strongly encouraged the U.S. administration to focus on Chinese overcapacity of aluminum as the major threat to the global aluminum market, and to the growing domestic aluminum industry. According to the U.S.-based Aluminum Association, aluminum.org, China’s state-subsidized production distorts markets and leads to illegal “dumping,” which happens when an exporter sells products abroad at a lower price than in its own domestic market.

On June 3-4, leaders from national aluminum associations in Canada, the United States, Europe and Japan held an international summit in Montreal, Canada, to address overcapacity, and called for a Global Multilateral and Governmental Forum on Aluminum Overcapacity.

The Charlevoix G7 Summit Communiqué, written by G7 leaders at the conclusion of the summit, recognized overcapacity issues and “stressed the urgent need to avoid excess capacity in ... sectors such as aluminum and high technology.” According to the Aluminium Association of Canada, aluminium.ca, it now falls to the G20 to create a forum and put in place an international monitoring system when it meets in November of this year.

Collins recommends that suppliers and buyers remain in contact regarding aluminum costs, and that suppliers be sure that the cost of aluminum they supply is guaranteed from their own supplier. He advises aluminum distributors or industry manufacturers to put language in agreements that refers to tariffs. “Ensure that you’re not guaranteeing pricing to your customers for one day longer than your material suppliers are guaranteeing costs to you,” he says.

Added to the cost and supply pressures of the tariffs are recent sanctions against Russian oligarchs that went into effect on April 6. Russia is the second largest supplier of primary aluminum to the United States. The U.S. Department of the Treasury, home.treasury.gov, targeted seven oligarchs for profiting from Russia’s reported “malign activity,” which included “attempting to subvert Western democracies, and malicious cyber activities.” Among those targeted was Oleg Deripaska, a major shareholder in United Company Rusal PLC, rusal.ru, one of the world’s largest aluminum producers. The abrupt loss of supply caused material costs to rise, according to reporting by the Financial Times, ft.com. On April 23, the Treasury Department announced that U.S. companies supplied by Rusal have until Oct. 23 to complete their agreements.

Simard emphasizes that it is the smaller, downstream business that will be most impacted by the current tariffs and disrupted by the current market uncertainty. “Businesses have to make decisions, and this is not sustainable,” he says. “Businesses cannot thrive on volatility.”

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In 2017, new construction and major additions constituted 66.5 percent of all nonresidential vision installations in the United States, with renovations making up the remaining 33.7 percent, according to the AAMA 2017/2018 U.S. Industry Market Studies from the American Architectural Manufacturers Association, aamanet.org, as researched by Ducker Worldwide, ducker.com.

The new construction and major additions vision area was up almost 6 percent in 2017 as compared to 2015, when the previous study was conducted. Replacement and renovation vision area also increased almost 6 percent in 2017 as compared to 2015, according to the study. The nonresidential glazing market increased by 3.7 percent in 2017, compared to 2015, with increases across all applications. Nonresidential installations are expected to continue to grow in 2018 and 2019, with potential declines in 2020, according to the report.

For new construction by project type, the retail segment (stores, other mercantile) saw the largest market share of glazing installations by far in 2017, with 29.2 percent.

The educational segment, which constituted 11.1 percent of installations, remained fairly steady compared to 2015. The healthcare category bumped up to 6.5 percent of installations in 2017.
Looking at product type, storefront windows represented the largest market segment, with 27.5 percent of overall installed nonresidential glazing in 2017, followed closely by site-fabricated windows, which made up 26.3 percent. Shop-fabricated windows made up 23.2 percent of installations, and curtain wall the remaining 23 percent. (See Fig. 2.)

The study highlighted in this article is an annual comprehensive report offered by AAMA. The report features national overview data on a variety of residential and nonresidential products. Purchase the report and learn more at aamanet.org/store.

**Fig. 2 Total Nonresidential Vision Area**
Segmented by type of construction (millions of square feet—vision area)

<table>
<thead>
<tr>
<th></th>
<th>Curtain wall</th>
<th>Storefront</th>
<th>Site-fabricated windows</th>
<th>Shop-fabricated windows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2015</strong></td>
<td>22.9%</td>
<td>27.4%</td>
<td>26.3%</td>
<td>23.4%</td>
</tr>
<tr>
<td><strong>2017</strong></td>
<td>23.0%</td>
<td>27.5%</td>
<td>26.3%</td>
<td>23.2%</td>
</tr>
</tbody>
</table>

up from 5.9 percent in 2015. (See Fig. 1.)

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Increased Energy Performance Requirements on the Horizon in ASHRAE 90.1-2019

By Tom Culp

What happened:
Proposals were advanced for ASHRAE 90.1-2019 at the ASHRAE summer meeting, with several notable changes on tap for the commercial glass and glazing industry. Key changes include more stringent requirements for thermal efficiency and solar control and removal of metal versus nonmetal distinctions. The meeting also included discussion of potential new proposals that, if done incorrectly, could limit window area.

Why it matters:
ASHRAE 90.1 is the benchmark for commercial building energy codes in the United States and a key basis for codes and standards around the world. The changes to the standard find their way into the codes, which dictate performance requirements for windows in all nonresidential buildings and residential buildings four stories or higher.

ASHRAE is nearing completion of the 2019 criteria for its 90.1 commercial building energy code standard, with several notable changes on the horizon for the glass and glazing industry. The determinations from the standard will likely form the basis for the 2021 International Energy Conservation Code proposals, making it essential for industry companies to be aware of updates to the standard.

This article presents the changes to ASHRAE 90.1 that will have the greatest impact on the glass and glazing industry.

Next step in stringency for U-factor and SHGC
The industry will see the next step in stringency for U-factor and solar heat gain coefficient requirements for glass and glazing in the 2019 version. After months of analysis and negotiation, various industry representatives and key stakeholders agreed upon a set of requirements that will continue the trend of increased stringency in the energy codes, while also being practical and cost-effective. U-factors decreased 5 to 15 percent between the 2013 and 2016 versions, and this downward trajectory will continue in 90.1-2019, with U-factor requirements decreasing another 5 percent and 17 percent in the various climate zones.

SHGC requirements also saw modest reductions across most climate zones, although they are not expected to cause drastic changes in glazing type from what is currently used. Solar control products will be needed in many locations, with lower SHGC in the south.

One new change is that the requirements will list separate SHGC criteria for fixed and operable products, just like the standards already do for U-factor. Importantly, this will not require different glazing for fixed and operable products, but will allow the committee to capture some unclaimed energy savings due to the fact that operable products inherently have a lower SHGC than fixed products even with the same glazing, due to the larger frame percentage.

What might this mean for the glass and glazing industry in terms of the types of products that likely would be required in the various climate zones? In a very rough sense, this represents a “zone shift,” with northern products moving a notch south. For example, what was currently required in Zone 7 would now be required in Zone 6, Zone 6 moves to Zone 5, etc. Overall, this will continue to push more advanced thermal breaks, warm-edge spacers, argon gas fill and 4th surface low-emissivity products.

In the warm weather climate of Zone 1, the industry will likely see the need for low-E double glazing with lower SHGC, such as the newest triple silver low-E products. Zones 2-3 will likely see low-E double glazing in a thermally broken frame, and potentially the use of argon fill. In Zones 4-5, low-E double glazing in a thermally broken frame will be required, along with two of the following: argon-fill, high-performance thermal break or two low-E coatings (No. 2 and No. 4 surface). Zone 6 will also require low-E double glazing in a thermally broken frame with three of the following: argon-fill, warm-edge spacer, high-performance thermal break or the two low-E coatings. Zone 7 would require all the options listed in Zone 6, or will move to triple glazing. In Zone 8, triple glazing will likely be required.

Elimination of material distinctions
Existing versions of ASHRAE 90.1 include separate U-factor requirements for nonmetal versus metal glazing systems. The IECC previously had this distinction based on frame material, but it was removed in 2012. As part of the overall proposal for ASHRAE 90.1-2019, there was agreement to match the ASHRAE 90.1 product categories to those used in the IECC. This results in separate U-factors for fixed windows, operable windows, entrance doors and skylights without regard to material type.
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This issue has been debated at ASHRAE for 14 years. It was agreed to resolve this issue in part because of the realization that the real-world market impact is small, as architects choose different window products appropriate for their particular application, not because of what the code category says. Additionally, the change will improve consistency with the IECC.

New limits on window area?
In the 2010 and 2013 versions of ASHRAE 90.1 and the 2014 version of ASHRAE 189.1, the glass and glazing industry fought back proposals that would have reduced the window-to-wall ratio from 40 percent to 30 percent on projects going through the prescriptive path. The industry won these battles by demonstrating how reduced window area would actually be contradictory to high-performance buildings, where access to quality daylighting and views improves overall functionality, health and wellness of occupants.

The industry has not seen such direct attacks on window area since that time. However, proposals to limit window area are potentially taking a different shape. While there were no specific proposals voted on at the ASHRAE meeting, there were discussions about introducing new restrictions on the performance path in ASHRAE 90.1 that limit trade-offs within the envelope. If done incorrectly, these limits could create an artificial barrier that would limit window area, even if equivalent or superior overall energy efficiency is shown.

One suggestion was a direct limit on the envelope performance—a certain performance level that the envelope can’t fall below when making other trade-offs in lighting and mechanical systems. The devil is in the details on how this would be done, and the impact on window area and building performance is unclear. It may be a solution in search of a problem that doesn’t exist, since the overall building energy efficiency is the same. This will be an important issue for the industry to continue monitoring.

What’s next?
The ASHRAE 90.1 committee unanimously approved the proposed U-factor and SHGC changes to go out for public review, which will likely occur in August. As the proposal achieved broad consensus, there should not be many comments, but any comments received will be addressed at ASHRAE 90.1’s next meeting in October.
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Legal

Beware of False Advertising in Marketing Puffery
By Matt Johnson

GlassBuild America is upon us. As always, the show presents an exciting opportunity to learn about new products and their capabilities. Marketing departments live for these moments. However, there is a fine line when a salesperson’s comment about performance turns from an opinion into a warranty or a false advertisement.

Prior to the show, this distinction is worth review, as such “puffing” can lead to fines. Consider a paint company that made a statement in 2018 that its products were VOC-free. This claim was legally challenged as being false. The manufacturer defended its product as mere puffing but lost the legal challenge and was fined.

In legal context, puffing is a defense against claims that advertising was false or created an express warranty. The manufacturer takes a position that its advertising or its salesperson’s actions were simply matters of opinion—or so general that no reasonable person could reasonably rely on the challenged conduct.

At its most basic, puffery is an expression of subjective opinion. Statements like “fine quality” or “amazing” or “best” when used to describe a product have been held as mere puff. But when those comments are used in a way that ventures toward measurable criteria or used in comparison with a competitor’s product, the distinction is less clear.

Consider the phrase “best per-hour rate.” When a word like “best” is attached to the phrase “per-hour rate,” the potential for advertising liability increases. This is because under most legal systems a statement relating to the performance, quality or nature of goods sold can become a warranty if that statement becomes a basis of the bargain. A comment that, when read in full, establishes a technically measurable standard can create a warranty that must be accurate and met when a product is delivered. If the statement is not accurate there is a potential for a false advertising claim. Likewise, if the performance is not met, there is additional breach-of-warranty exposure.

Alternatively, a general statement that may seem like mere puffery can still prove problematic when used. For example, “Better Ingredients. Better Pizza” was a slogan used by a pizza franchise in the early 2000s. This franchise was sued by another pizza company for false advertising, and the Third Circuit Court of Appeals found that the slogan itself was general and close to puffing. However, because the slogan was used in an advertising program that directly questioned the ingredients and quality of competitors’ pizza, there was A comment that, when read in full, establishes a technically measurable standard can create a warranty that must be accurate and met when a product is delivered.
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a violation of the Lanham Act—a set of federal regulations governing false and deceptive advertising.

Glass and glazing companies regularly run into general statements of subjective quality that are simple puffery. But as technology advances and it becomes easier to quantify the qualitative, liability risks abound. For this industry, one need look no further than the various environmental impact claims surrounding modern glazing. Consider words such as renewable versus sustainable; efficient versus neutral; recyclable versus recycled content. These terms, which can seem general, have very specific technical measures that must be met in order to be advertised with the descriptors. In fact, environmental claims are so technical that the Federal Trade Commission has published regulatory guidelines for proper use of environmental marketing—the “Green Guides.”

Absent governmental guidance, what can a company do when considering whether its advertising is simple puff or presents potentially misleading or false claims? Content checks are a good first step. Keep representations neutral, toward both performance criteria and competitors’ products. Content must also be used in a neutral context to avoid inappropriate implications, as in the example of the pizza company above.

If there is a performance point or production target worth advertising, be sure to have the testing and validation to support those claims. Include in the advertising any necessary disclaimers regarding the conditions or circumstances of the testing so viewers can appreciate that their circumstances may differ. And if a comparison is made with another manufacturer’s products, be sure that the most current model and equal evaluations are used. Advertising based on outdated data, or a failure to regularly update testing to current production models, has been held to be false advertising.

Finally, understand that advertising liability, in large part, does not depend on intent. It is not necessary that a competitor or consumer prove that someone intentionally presented a false advertisement for liability to exist. The risk for penalties and fines focus most often on those who received the advertising, not the company issuing the offending ad. Even so, it is worth noting that if it can be shown there was an intent to mislead, or the advertising was issued with a reckless disregard for accuracy, punitive damages and personal fines are possible.  

Matt Johnson is a member for The Gary Law Group, prgarylaw.com, a Portland-based firm specializing in legal and risk issues facing manufacturers of glazing products. He can be reached at matt@prgarylaw.com.
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Impact of Edge of Glass versus Center of Glass on Window U-factor

By Helen Sanders

Over the years, the glass industry has relied heavily on reducing the center of glass U-factor as a way of driving down overall fenestration U-factors (thermal transmittance). Strategies have included increasing the performance of low-emissivity coatings, using multiple coatings, adding inert gases, and more recently, moving to triple-pane units. However, the COG U-factor makes up only part of a window’s performance. To achieve the lowest fenestration thermal transmittance and highest condensation resistance, it is necessary to look more broadly at the window as a system, including the edges: the frame and edge of glass.

Focusing on preventing heat flow through the COG only, rather than considering the window as a whole, is the thermal equivalent of damming a river at its center, yet forgetting to block water flow all the way to its banks. In the case of the river, its flow is not stopped; the water just flows around the edges of the dam. Illustration courtesy of Technoform, technoform.us.

Preventing heat flow through the center of glass only, rather than considering the window as a whole, is the thermal equivalent of damming a river at its center, yet forgetting to block water flow all the way to its banks. In the case of the river, its flow is not stopped; the water just flows around the edges of the dam. Likewise, in the case of the window, the energy still flows through it, even if the COG conductance is low. It does so by taking the path of least resistance around the edges of the window—through the frame and EOG.

The graph on page 30 illustrates how the window U-factor varies with the COG, frame and EOG (spacer) performance, and demonstrates how the specifications of the edges of a window control the overall U-factor performance.

In a poor-performing, non-thermally broken frame with an aluminum insulating glass spacer, changing the COG performance from 0.29 to 0.24 btu/°F.hr.ft²—equivalent to adding argon to a double-pane low-E insulating glass unit and changing the coating from a double silver to a triple silver—provides only a 6 percent reduction in window U-factor. Yet, without making any change to the COG performance, the change to a high-performance thermally broken frame with a warm-edge IG spacer reduces the overall window U-factor by 36 percent. The implication is that when specifying a fenestration system, the first focus
The Erdman High Speed Dura Line produces finished gas-filled IG units, that are ready to glaze immediately, at a rate two to three times faster than traditional IG lines. Total labor for the Dura line is 3-4 operators per up to 1200+ unit shift.

Yup. Just ask Kyle...

"In a state with nearly 0% unemployment, we’re finding it more difficult to recruit qualified production employees," states Kyle Hawthorne, Vice-President of Operations at Mathews Brothers Company, in Belfast, ME.

"Since we installed the Erdman Parallel Process Duralite IG Line, we produce the same number of finished IG units in an 8-hour shift with 4 employees, that used to require 12 people working 10 hours," he continued, "This allows us to shift our labor into areas that require more critical thinking."

"The Inkjet Printer allows us to date-stamp the spacer on-line, which saves labor, but also minimizes obstructions to the sight line. The Argon Filling Chambers have not only increased efficiency, they’ve lowered our material costs. The Quartz Heating Lamps allow for immediate sealing of the units, which improves quality and leads to a more reliable sealed unit for our customers. And the Final Press uses uniform pressure as opposed to the tapered rollers, which we also believe adds to the quality," Kyle concluded.
Improvements in the thermal performance of the edge of glass (spacer and frame) can provide larger improvements in overall system U-factor, compared to improvements in center of glass alone.

- Non-Thermally Broken Frame, Aluminum Spacer, COG=0.29
- Non-Thermally Broken Frame, Aluminum Spacer, COG=0.24
- Thermally Broken Frame, Warm-Edge Spacer, COG=0.29
- Thermally Broken Frame, Warm-Edge Spacer, COG=0.24

6% change
32% change
12% change

Because condensation resistance also is driven by thermal bridging—or lack thereof—at the fenestration edge, not the center, improving frame and EOG thermal performance first has a dual benefit of increasing performance in this dimension, too. For the example above, the condensation resistance of the non-thermally broken window wall is only 40, compared to 53 for the thermally broken system.

The moral of the story is that when designing windows for thermal and condensation resistance performance, start with the edge first. Doing so delivers higher performance and more flexibility, reduced complexity and potentially reduced cost for the glazing in-fill.

Helen Sanders, PhD, helps to lead strategic business development activities at Technoform Glass Insulation NA Inc., technoform.us. She can be reached at 330/487-6600.
CAN WE TALK ABOUT THE ELEPHANT IN THE ROOM?

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To learn more, contact our sales representatives.
The primary responsibility of a business owner or company manager is to make sure that employees are always paid on time. Nothing erodes company morale and employee goodwill more than missing payroll.

In my experience financing distressed businesses, few companies ever recover from missing payroll. By the time they reach that point, the situation is already so dire that little can be done. The only effective solution is to prevent it from ever happening.

The first step toward this solution is always knowing a company’s financial standing. I am always surprised when business owners cannot provide me with accurate financial reports. This occurrence is common for small business owners, especially in the construction industry. But without financial reports, how can an owner know where the company stands financially?

Cash in the bank is not always a good indicator of how well a company is doing, since it does not give an idea of payables or receivables. The best way to get a good financial picture of a business is to update the accounting system regularly and review the following reports:

1. Cash flow statement
2. Accounts receivable aging
3. Accounts payable aging
4. Profit and loss statement

Once an owner knows where the business stands financially, he or she can better understand where it is headed. An owner should spend time developing a sales forecast, then determine the cost to deliver those sales and evaluate if the company has the resources to do so. This last point is crucial. Businesses often hit a cash crunch because they did not have the resources to handle their sales book, but made the sales anyway. It’s not unusual for these types of problems to put the business into an unrecoverable tailspin. Therefore, an owner must plan finances so they can manage the business effectively and capitalize on opportunities.

Several solutions exist that can help a company finance payroll. Some solutions are better than others—and some can actually do more harm than good. Remember that payroll is an ongoing expense. Consequently, it’s best to have a financial solution that provides revolving financing.

RECOMMENDED SOLUTIONS

1. A company’s financial reserves
The absolute best way to “finance payroll” is for a company to do it itself by building financial reserves. When the time comes, an owner can use reserves to cover payroll expenses. (For details on how to build a financial reserve, see the article “How to Build a Cash Reserve” on page 18 of the April 2016 issue.) The first step is to size the reserve correctly. An owner should partner with the finance department or a CPA to determine what number works for the business. Once the size of the reserve is determined, the company needs to start saving money. The company should build its reserve over time by contributing a little every month.

2. Revolving lines of credit
If a company’s reserves are not sufficient, an owner can consider a line of credit. Lines of credit provide the most flexibility. They allow a company to borrow money when needed and repay it once finances improve. Lines
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of credit are excellent solutions that allow a company to complement existing reserves. Unfortunately, they can be difficult to get due to their qualification requirements.

3. Invoice factoring
Invoice factoring is an alternative to commercial lines of credit. Many companies experience financial problems because they can’t afford to wait 30 to 90 days to get their invoices paid. Factoring, in which a third party takes over collection of an invoice while advancing the company a portion of the balance owed, accelerates these payments and improves cash flow. This helps a company meet payroll. While factoring is easier to get than a line of credit, the solution is more expensive and less flexible.

OPTIONS TO AVOID

And now, a few options that don’t work well to finance payroll. While there is nothing wrong with these financing solutions per se, they are not ideal for solving payroll problems.

1. Business loans
Business loans can be a great solution to finance the purchase of equipment or property. They can also be used to finance certain projects. However, they are not an effective way to finance payroll because payroll is an ongoing expense.

2. Merchant cash advances/ACH loans
Merchant cash advances, also known as ACH loans, can provide a quick cash-flow infusion to a business. They have a structure that is like a loan, where a company gets a lump sum and then makes fixed payments over time. However, they are very expensive and are not well-suited to finance payroll.

3. Home equity lines of credit
Home equity lines of credit provide the flexibility of a business line of credit, at a very affordable cost. However, because they use the owner’s home as collateral, the owner is risking their home for the business. If things go wrong, the owner could lose all equity—and the house.

The decision to get business financing is very important and should be made only after weighing the pros and cons. I suggest that owners consult their finance team or a CPA before seeking financing. Their advice will likely save money in the long run.

Marco Terry is managing director of Commercial Capital LLC, comcapfactoring.com, a factoring company and leading provider of invoice financing to companies in the glass industry. He can be reached at 877/300-3258.
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Testing • Architectural Powder Coat • 3D Prototyping
Insulating Glass Strength Made Simple
An easier way to calculate glass strength for ASTM E1300 and ASCE 7
By Joseph Minor

Editor’s Note: The following article is adapted from the technical paper “Insulating Glass Strength Made Simple” by Joseph E. Minor and H. Scott Norville. To read and download the complete technical paper, visit GlassMagazine.com/August2018.

To meet current code and standard requirements, insulating glass manufacturers must be able to calculate the strengths of units according to ASTM E1300 and compare them with wind pressure requirements defined in ASCE 7. However, the ASTM E1300 standard and ASCE 7 requirements present an overly complex process for calculating and comparing insulating glass unit strengths. Numerous manufacturers have expressed confusion about the complicated calculation methods, demonstrating a need for a simpler way to determine IGU strengths for comparison with ASCE 7 wind pressure requirements.

I teamed up with H. Scott Norville, my colleague in the Department of Civil, Environmental, and Construction Engineering at Texas Tech University, to seek a simpler way of calculating IGU strengths. We completed a study of IGU strengths as defined in ASTM E1300 and, based on those results, developed a method of determining IGU glass strengths that uses easy-to-read tables in place of more complicated calculations.

This article presents a summary of those findings, along with the relevant calculation tables.

The study
Single lite windows with fully tempered or heat-strengthened glass are strong enough to carry commonly specified wind pressures acting alone. In our study, we reasoned that the addition of a second lite to make a sealed IGU should not reduce this basic strength. However, several glass experts familiar with the principle of load sharing in sealed IG units were quick to point out that it is possible that a lite added to a single lite to form an IG unit could break before the wind pressure associated with the strength of the single lite is reached.

In response to these concerns, we conducted an exhaustive assessment of the possibilities of breakage in the second lite in an IG unit when the IG unit experiences wind pressures equal to the strength of the stronger, single lite acting alone. We found that breakage of the added lite will occur in only three of the many possible IG unit lite thickness combinations, if only three commonly used glass lite thicknesses are considered.

We developed two simple procedures for selecting two lites to form an IG unit that are based on the strength of a single fully tempered or heat-strengthened lite, with only three exceptions.

The smallest possible strengths for three common thicknesses of four-side supported glass plates with three surface areas were determined from Load Resistance (strength) charts in ASTM Standard E1300. In accomplishing this task, it was determined that strengths of monolithic and laminated glass are essentially the same. These nine glass plate strengths appear in Table 1 under the column heading AN, for annealed. Multiplications of these entries by two for heat-strengthened and four for fully tempered glass complete the table.

### Table 1. Insulating Glass Strength

<table>
<thead>
<tr>
<th>Glass Area (square feet)</th>
<th>Thickness (inches)</th>
<th>AN</th>
<th>HS</th>
<th>FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1/4</td>
<td>17</td>
<td>35</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>5/16</td>
<td>26</td>
<td>53</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>3/8</td>
<td>36</td>
<td>73</td>
<td>145</td>
</tr>
<tr>
<td>60*</td>
<td>1/4</td>
<td>15</td>
<td>30</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>5/16</td>
<td>22</td>
<td>45</td>
<td>88</td>
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<td>119</td>
</tr>
<tr>
<td></td>
<td>1/4</td>
<td>13</td>
<td>26</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>5/16</td>
<td>19</td>
<td>39</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>3/8</td>
<td>26</td>
<td>51</td>
<td>103</td>
</tr>
</tbody>
</table>

1 AN - annealed, 2 HS - heat-strengthened, 3 FT - fully tempered

Perform E1300 procedures for insulating glass units with an AN lite. Use E1300 procedures for these insulating glass unit constructions: 3/8-5/16 HS/FT, 3/8-1/4 HS/FT, 5/16-1/4 HS/FT

*Example: An insulating glass unit with a 60-square-foot, 5/16-inch, HS lite and any second lite will have a minimum IG unit strength of 45 pounds per square foot and will meet specified wind pressures up to this amount.
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the three common thicknesses, when the strength of the stronger lite for a given surface area, glass thickness and heat treatment exceeds a specified wind load. For example, any dual lite IGU with a surface area of 60 square feet or less that contains a 5/16-inch, heat-strengthened lite will meet specified wind loads up to 45 pounds per square foot (see shaded entries in Table 1). If the strength of an IG unit construction selected in this manner does not exceed the specified wind load, ASTM E1300 procedures may yield a larger strength and a satisfactory IG unit construction.

We employed ASTM E1300 procedures to calculate the strengths of all IG unit constructions composed of six combinations of three commonly used glass thicknesses, six combinations of three heat-treatments, and three surface areas, as defined in Table 1.

It was found that IG unit strengths are less than the strengths of the stronger lite acting alone (Table 1 entries) in only 19 IG unit constructions. Twelve of these 19 contain annealed glass lites that are seldom employed in IG units because of their low resistance to edge thermal stresses. The remaining seven IG unit constructions contain combinations of fully tempered and heat-strengthened glass lites. Four of these seven have IG unit strengths that are smaller than the strengths of the stronger lite by very small amounts, and the last three have IG unit strengths that are significantly smaller. Excluding the 12 IG units with annealed glass lites and the four with IG unit strengths that are insignificantly smaller than the corresponding strengths of the stronger lite, there are only three IG unit constructions that must be excluded from the procedure outlined in Table 1.

We also developed a procedure to determine if a selected single lite with a defined thickness, heat-treatment and surface area can be used in an IG unit on a building with a specific height and meet specified wind loads. Table 2 lists single lite strengths (from Table 1) for heat-strengthened and fully tempered, 1/4-, 5/16- and 3/8-inch glass, with areas of 50, 60 and 70 square feet.

The minimum strengths of IG unit constructions containing one of these lites as the stronger lite were compared to design wind pressures for various building heights determined from ASCE 7-16, the national wind load standard. The limiting building heights for each IG unit construction apply to ordinary structures (Risk Category II buildings), in suburban terrain (Exposure B), that are subjected to two windspeeds defined in ASCE 7-16: (1) the largest Inland Zone windspeed of 115 miles per hour and (2) a Hurricane Zone windspeed of 150 miles per hour. For example, any IGU that contains a 5/16-inch, heat-strengthened lite with a surface area of 60 square feet or less, will meet ASCE 7-16 specified wind loads for buildings less than 450 feet in height in Inland Zones, and less than 60 feet in height in Hurricane Zones where the design windspeed is less than 150 miles per hour.

1HS - heat-strengthened, 2FT - fully tempered
Insulating glass constructed of 1/4, 5/16, 3/8 in. FT and HS glass lites only. Use E1300 procedures for these three insulating glass unit constructions: 3/8-5/16 HS/FT, 3/8-1/4 HS/FT, 5/16-1/4 HS/FT
*Example: An IG unit containing a 5/16-inch HS lite, 60 square feet or less in area will meet ASCE 7-16 wind load requirements for Risk Category II buildings in Suburban Exposure up to 450 feet in height in Inland Wind Zones and up to 60 feet in height in Hurricane Wind Zones where the design windspeed is 150 miles per hour or less.
LiSEC USA to become market distributor for Schraml (a LiSEC Company) effective July 1st, 2018. LiSEC America shall be responsible for sales, installation and aftermarket service for future and existing Schraml glass processing machines in North America. Up until now, Schraml glass processing machines have been exclusively sold and serviced in the USA by Machines and Wheels. In May an agreement was reached with Machines and Wheels to terminate that contract. Bob Quast, President and CEO of LiSEC America, Inc., notes: “We appreciate the previous efforts of Machines and Wheels on the market and look forward to a seamless transition for all Schraml customers in North America”.

Two years ago, LiSEC bought Schraml Glastechnik GmbH, since that time LiSEC has been evaluating the existing relationships and looking to the future for Schraml equipment in its various markets. Based on that review the decision was made to move ahead with transitioning the distribution to LiSEC’s existing company in North America, LiSEC America, Inc. As Mr. Hans Hoenig, Sales Director LiSEC North America states: “Since we already have a very well-established sales and service organization in the US with a vast knowledge of the market and trends, it only makes sense to utilize the existing structure to also support Schraml machines in the market”.

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best in glass processing
GlassBuild America: The Glass, Window & Door Expo is expected to host about 876 exhibitors, including about 100 from outside the United States, Sept. 12-14, at the Las Vegas Convention Center. The following pages present a look at the innovative glass, metal and equipment products that will be on display at the show. Products marked as “NEW” indicate those that will debut at the show, according to submitting companies. Note that booth numbers are subject to change. For the most up-to-date information, visit glassbuildamerica.com. For the schedule-at-a-glance, see page 84; for a complete GlassBuild America exhibitor list, see page 90. The most up-to-date exhibitor and schedule information is available at glassbuildamerica.com.

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01 / Millet Glass Industry
Millet Glass will exhibit its range of architectural glass, which includes insulating, laminated, tempered, heat-strengthened, annealed, screen-printed, digital-printed and jumbo-sized glass. Its digital printing uses Jet-TecGlass technology, and is available in formats up to 6 by 3 meters and resolutions of 720 to 1,440 dpi. The company also produces architectural hardware. Booth #329
+(52) 9996-1163-44 | MILLET.COM.MX

02 / SGC International Inc.
SGC International Inc. will exhibit its new Crystal Series Glass products. The series is manufactured with a low-iron glass technology, resulting in a clear, color-neutral product. The series includes architectural glass for interior and exterior applications, decorative glass, specialty glass, clear mirror, impact glass and shower-door glass. Booth #318
323/318-2998 | SGC-USA.COM

03 / Tubelite Inc.
Tubelite will showcase its 400T Series thermal curtain wall. The product is a shear block outside glazed, captured system that can be stick fabricated for field glazing. Its concealed fastener joinery creates a smooth, monolithic appearance. The system, with optional polyamide pressure plate, has been tested and modeled per the NFRC procedure, achieving a U-factor of 0.32 for thermal transmittance. This configuration was also tested per the AAMA 1503 standard, achieving a frame CRF of 79. Booth #713
800/866-2227 | TUBELITEINC.COM

04 / Cam Merkezi – Yorglas
Cam Merkezi – Yorglas will exhibit its new Yorboard, a glass writable surface. The product provides a professional and upscale appeal without sacrificing any of the durability of classic whiteboards, the company reports. Available as a magnetic or non-magnetic bulletin board, Yorboard will never stain, and is fingerprint-free and customizable. Applications include office interiors, meeting and conference rooms and healthcare nurse stations. Booth #508
+(90) 2323-7678-01 | YORGLAS.COM
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New Express 770 CWA
- 770lbs lifting capacity
- 1 man operation
- Works in tight spaces
- Motor drive
- Multi-directional fine adjustment for glazing

New Express 330T
- 330lbs lifting capacity
- 1 man operation
- Mast extension for glazing over doorways

New Express 440 CW
- 440lbs lifting capacity
- 1 man operation
- Works in tight spaces

New machines at GlassBuild 2018 Booth #517

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DECORATIVE GLASS

01 / Sevasa
Sevasa will introduce its new Grid collection, acid-etched architectural glass with new decorative designs. The designs feature grid-like patterns that develop into lineal (Grid), organic (Garden) or ethnic abstraction designs (Folk). Grid 6-T can function as bird-safe glass in facades and windows, and Grid 24-T is human-safe for doors and passage areas. Versatile in size and bidirectionality, finishes include transparent, satin and tone-on-tone.
Booth #345
+(34) 938-2803-3 | SEVASA.COM

03 / Lamatek Inc.
Lamatek’s expanding line of Protek packaging offers protection solutions for windows, doors, glass and other components. Debuting at GlassBuild America, Protek surface protection films guard delicate surfaces from dust, scratches, UV (up to six months) and damages during production, installation and shipping. The non-abrasive, crush-proof, Protek shipping corners and blocks absorb multiple impacts, energy and vibrations to protect windows from damage. The company’s glass separator pads are available in a variety of new and current materials to provide residue-free protection, company officials report. Booth #1172
800/526-2835 | LAMATEK.COM

HANDLING AND PACKAGING

03 / Lamatek Inc.
Lamatek’s expanding line of Protek packaging offers protection solutions for windows, doors, glass and other components. Debuting at GlassBuild America, Protek surface protection films guard delicate surfaces from dust, scratches, UV (up to six months) and damages during production, installation and shipping. The non-abrasive, crush-proof, Protek shipping corners and blocks absorb multiple impacts, energy and vibrations to protect windows from damage. The company’s glass separator pads are available in a variety of new and current materials to provide residue-free protection, company officials report. Booth #1172
800/526-2835 | LAMATEK.COM

DOORS

02 / dormakaba
The new HSW-ES horizontal sliding glass walls will be featured at dormakaba’s booth. The HSW-ES system allows unlimited interior design options to make planning and specification far less complicated, the company reports. The product allows for the optional use of tempered laminate glass. The system also offers transparency, acoustics and safety benefits.
Booth #1113
800/523-8483 | DORMAKABA.US

Maglev Glide (not pictured)
Maglev Glide will introduce its magnetic levitating door system. The door uses neodymium magnets to fully levitate above the track as it glides silently open or closed with little effort, company officials report. The levitating door eliminates the need for supporting rollers or hinges, which are prone to wear and tear. Maglev Glide is patented, offering a silent, rust-free and maintenance-free sliding door system.
Booth #876
844/991-9992 | MAGLEVGLIDE.COM

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NEW

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01 / C.R. Laurence
C.R. Laurence will debut its new Entice Panic Device by Blumcraft. The product features an ultra-narrow horizontal crash bar that’s designed to easily and securely attach to the vertical panic component. This unique 2-piece system results in effortless alignment and one-man installation, says the company. The Entice Panic can be mounted onto both monolithic tempered glass and double-glazed insulating glass using precision-engineered through glass fittings. The 2-piece system also means that the Entice Panic can be packaged into a smaller, narrower container. Booth #1227
800/421-6144 | CRLAURENCE.COM

02 / FrontLine Building Products Inc.
FrontLine Building Products Inc. will introduce the company’s new aluminum surround grille. This grille uses a double corner key design and a 1 ¾-inch depth that screws into a new or existing window frame to provide a finished look, the company reports. The intermediate grille profile is screwed to the surround profile for additional durability. Silicone discs eliminate rattle and allow for easier spray-cleaning. Grilles are available in angled and radius shapes in any color, fully assembled for easy installation on the jobsite, according to the company. Booth #766
800/223-4792 | FRONTLINEBLDG.COM

03 / Caldwell Manufacturing Co.
Caldwell expanded its Magnum bi-fold hinge system product offering to include both top and bottom rolling hinge product lines. Magnum hinges are designed to handle higher structural loads—up to 240-pound panel weights, eight panels each way. The extruded aluminum friction hinges are designed to offer maximum adjustment without hinge deflection and stay features to reduce system drift and panel damage. Magnum hinges feature a sealed stainless-steel bearing wheel system. Caldwell offers the system by the piece, hinge set or full hardware system in a variety of colors or a custom color match option. Booth #1163
888/347-7771 | CALDWELLMFGCO.COM
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HARDWARE

01 / Rockwell Security Inc.
The Rockwell M3 high-performance dual vertical and horizontal adjustable hinge offers a lift-off feature, a concealed ball bearing and a non-removable pin. The hinge is vertically adjustable by ¼-inch and horizontally adjustable by ⅝-inch. The lift-off feature allows for easy door removal and installation without any tools, company officials report, and is third-party tested to exceed ANSI/BHMA 156.1 with three hinges on a 180-pound door panel. Rockwell M3 hinges, suitable for new installation or replacement, are available in steel, stainless steel and solid brass in architectural and coated finishes. Booth #1238
510/270-5633 | ROCKWELLSECURITYINC.COM

02 / Tag Railing Inc.
Tag Railing Inc. will debut its new hydraulic door closer CFHP150. The new bottom patch fitting CFHP150 is engineered to eliminate a conventional floor closer. The product has a 2 ¾-inch setback, featuring precision control with a door opening angle of 140 degrees, and double-acting 90 degrees to accommodate doors up to 48 inches wide. Its unique design features a self-closing mechanism with adjustable closing and latching speed. Booth #1450
226/600-5068 | TAGRAILING.COM

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INSULATING GLASS COMPONENTS

01 / Fenzi North America
Fenzi North America will debut its new Sealver AR, a two-part silicone insulating glass sealant, the latest product introduced by the company for insulating glass applications. Made in North America, Sealver AR offers insulating glass manufacturers superior durability, low moisture vapor transmission rate/gas transmission rate and easy application, the company reports. Booth #2741
416/674-3831 | FENZI-NA.COM

02 / Quanex Building Products
Quanex Building Products will showcase its Super Spacer TriSeal. The product, say company officials, provides a unique triple seal design which incorporates an inner acrylic adhesive seal for immediate unit handling, a polyisobutylene primary seal for enhanced gas retention and low moisture vapor transmission, and an outer silicone seal for proven structural strength and superior durability. Features include a thermoset, silicone spacer with no integral desiccant, and a unique triple seal design. Booth #1427
713/961-4600 | QUANEX.COM

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Practical Solutions for the Glass Professional
Chung How Paint Factory
(not pictured)
Chung How Paint Factory will showcase its CUR Solar Control PVB Film. The product has an infrared radiation absorber inside. The film shields up to 50 percent of solar heat and passes 70 percent of visible light, providing the same views as regular laminated glass, with added heat-shielding ability, the company reports. The film also improves sound insulation, at a level of 5 decibels higher tolerance than regular laminated glass. Booth #1673
+(886) 6384-2345 | SUPERCOAT.COM.TW

01 / Nanovations USA
Nanovations USA will debut NG-1010 hydrophobic glass treatment, an invisible, ultra-thin coating, formulated with inorganic colloidal silica to offer water-repellent and easy-to-clean glass surfaces. The coating is free of silicone, wax, Teflon and siloxane, and is UV-resistant and resistant to abrasion. In a
During GlassBuild America, Renolit will showcase its two new colors in the Exofol FX exterior film range: Black Smooth 2, a true black; and Anthracite, a modern, darker gray. Both colors are available from stock with either the traditional wood tic or the contemporary smooth/stipple emboss finishes. Renolit uses infrared reflective inorganic pigments in its FX formulation, resulting in a very low heat buildup rating, long-term performance and film stability, company officials report. Renolit extended its Exofol FX warranty to 20 years. Booth #863
219/324-6886 | RENOLIT.COM/EXTERIOR/US

Surface Armor LLC (not pictured)
During GlassBuild America, Surface Armor LLC will showcase its temporary protective films and tapes that protect commercial glazing architectural systems from jobsite damages. The company delivers its products with quick lead times and low minimum order quantities, it reports. Free samples are available upon request. Booth #1373
972/722-7351 | SURFACEARMOR.COM

MACHINERY AND EQUIPMENT

04 / Bavelloni America Inc.
The new VDM 1636 NC vertical drilling and milling machine from Bavelloni is equipped with one double drilling head (1+1 opposing spindles), with rotating tool storage (eight positions each). The user-friendly design offers technical features that ensure working accuracy, company officials report. Milling is performed while the glass is in a fixed position for higher grinding quality and speed. The control device combines an NC with the convenience of working in a Microsoft Windows environment. Its features and functionality suit it specifically for producing doors, as well as glass for interior and exterior architectural applications. Booth #2963
336/299-8300 | BAVELLONI.COM
MAChinery and equipment

01 / Billco Manufacturing
Billco will introduce the Remnant Storage System, which identifies, stores and reclaims remnants for maximum cutting yields, eliminating the need for commonly neglected offal storage carts. The system is engineered to minimize idle time by optimizing glass flow as well as reducing manual glass handling, keeping operators at a safe distance. The modular design is expandable to meet growing production needs. The system offers features such as sub-plate cutting, dual axis automated breakout and multi-slot storage. Booth #2451
724/452-7390 | BILLCO-MFG.COM

02 / Bovone Elettromecanica
Bovone Elettromecanica will show the BRS Bovone Robotic System. The BRS on display at Vitrum 2017 is designed to be incorporated with the company’s ELB 12 HS high-speed straight-line edger. According to the company, the system automates and accelerates the processing of large sheets of glass. Because the BRS reduces reliance on operators, the system can increase safety and profitability. Booth #2375
+(39) 0143-837511 | BOVONE.COM

03 / Casso-Solar Technologies
Casso-Solar Technologies and Kuraray developed a system to trim excess SentryGlas after lamination. The SentryGlas Trim Table eliminates the need to use hot knives to clean up assemblies. The table uses an infrared heater to heat the excess interlayer along an edge for trimming using a standard razor blade. The system features single-button operation and handles sizes up to 120 by 120 inches, in thicknesses up to 2 inches. Custom options include operator cutouts, tile load/unload capabilities, clamping systems and edge rollers. Booth #963
845/354-2010 | CASSOSOLARTECHNOLOGIES.COM

04 / Emmegi USA Inc.
Emmegi’s new Satellite XT 5-axis CNC machining center features a moving gantry structure, designed for milling, drilling, cutting and more of aluminum, PVC, light alloys and steel. The moving part of the machine consists of a gantry with precision rack-and-pinion drive, with a 15-kilowatt continuous, electrically driven spindle. It can be used in double mode to minimize machine downtime by changing the workpiece. The double operation version can improve this feature, positioning the vises independently from the portal movements. Booth #1815
201/935-0200 | EMMEGI.COM
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MACHINERY AND EQUIPMENT

01 / Erdman Automation Corp.
Erdman Automation Corp. will debut its Unmanned Robotic IG Work Cell, capable of producing large insulating glass units with no direct labor. The work cell, which reduces required floor space, features three robots: one for loading; one for holding the glass during flexible spacer application and gas filling; and one for sealing and offloading. The target cycle time for a 5-by-12-foot IGU is 60 seconds with no gas fill or 90 seconds with gas fill. Booth #1927
763/389-9475 | ERDMANAUTOMATION.COM

02 / Forel North America
Forel will introduce the DM - Drilling and Milling Machine. The six-axis controlled machine has two opposing electronic spindles to deliver high precision and fast production, and features monoblock construction for accuracy. Forel’s patented suction cup system reportedly ensures stability during operation, and two water circuits keep the tools and glass cool at all times. The DM is equipped with a self-diagnostic system that identifies faults with codes, descriptions and images. Also on display during GlassBuild America: automatic arrissing machine, vertical washer, automatic profile bender and more. Booth #3127
651/493-4378 | FORELSPA.COM

03 / Glasslam
Glasslam will show its WorldSpacer Production Line for just-in-time production of the company’s WorldSpacer flexible foam spacer. WorldSpacer is a stainless steel backed flexible polyurethane spacer system designed for optimum insulating glass unit durability and warm-edge performance. With the WorldSpacer production line, IGU fabricators can reduce flexible spacer cost and address spacer inventory issues, according to company officials. The line features a zigzag conveyor addition that eliminates 60 feet of length. Booth #1763
954/975-3233 | GLASSLAM.COM

04 / Glaston
Glaston will showcase Glaston iLooK, its automatic online glass quality control system family of products, which includes iLooK Distortion and iLooK Anisotropy. iLooK is an online measuring system for flat glass tempering machines, and is available for all tempering machines as an integrated or stand-alone version. The company will also exhibit its grinding tools, including XtraSharp, XtraLight and XtraSpeed. Booth #2927
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MACHINERY AND EQUIPMENT

01 / HHH Tempering
HHH Tempering Resources will show the Butyl Extruder Machine LJTB01. The equipment offers increased speed and precision when applying butyl coatings to insulating glass units, according to HHH officials. The Butyl Extruder LJTB01 automatically adjusts glue measurements based on speed change and identifies aluminum bar width and glue nozzle adjustments. A fast preheat function, PLC control system and touchscreen interface make operation quick and easy, according to HHH. Booth #2527
724/201-2921 | HHHTEMPERING.COM

02 / JRC United
JRC United will show Oemme’s Layout 51 CNC, an efficient system for thermal break profile assembly. The completely automated production line requires only three operators and can produce up to 120 bars per hour. Layout 51 CNC consists of a knurling machine, a plastic bar inserting device and a CNC assembling unit. Also available are complementary machines, such as a roller conveyor on belts for bar transfers and an automatic unloading conveyor with single buffer. Booth #1826
844/230-8021 | JRCUNITED.COM
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BOOTH 2727
MACHINERY AND EQUIPMENT

01 / J&S Machine Inc.
J&S Machine Inc. will be displaying the CR13BRIMW profile bending machine from 3C - C.L.O.M.E.A. The CNC-controlled machine is capable of creating multiple radius shapes including half ellipses and ovals. The control system uses the roller die and profile information to automatically calculate the necessary roll positions to achieve a required radius. The machine uses a database to record springback of the profiles bent, in order to reduce waste when creating new programs. The CR13BRIMW can also be fitted with several attachments to aid in bending angle profiles, curved handrails and S-curves. Booth #1762 715/273-3376 | JSMACHINE.COM

02 / Lattuada North America Inc.
Lattuada North America Inc. will promote its customized robotic integration solutions that provide automation, flexibility, productivity, optimized production and reduced costs. The most common application includes a fully automatic glass size reading device and a Kuka robot that connects two edgers. Options include automatic and integrated online measuring; automatic adjustment of machine speed according to glass size; continuous production for increased productivity; and automatic glass rotation. Booth #2363 567/249-4486 | LATTUADA-NA.COM

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- CNC Centres - 3 and 4 axis
- CNC Drilling - drilling and milling

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The automatic dubbing facility enables the finished pieces to be transferred immediately to the toughening process and can be set to perform four different processing operations on each corner. The dubbed corners are also safer to handle.

September 12-14 Las Vegas, Nevada
Booth 2173
MACHINERY AND EQUIPMENT

01 / Liseck
Lisec will promote its Velocity Plus high-speed insulating glass production line. The line touts a cycle time of 16 seconds for a double IG unit (26 seconds for a triple IGU) measuring 35 by 23 inches with hot melt seal. The fast production and low capital expenditure is made possible through parallel assembly of two insulating glass units with different sizes, and two spacer applicators. Booth #1963 952/641-9900 | LISEC.COM

02 / LiteSentry Corp.
LiteSentry Corp. will debut the Osprey B Complete with Anisotropy & Distortion, an online inspection and visualization system of anisotropy, distortion and flatness of each glass sheet. The Osprey B was developed in partnership between Lite-Sentry and Stress Photonics. The system measures and quantifies iridescence, residual stress, haze, heat stain, bow and many other stress-related phenomena. According to company officials, accurate and repeatable measurement allows the user to reduce the phenomena through improved process control. Booth #2008 507/645-2600 | LITESENTRY.COM

03 / Machines and Wheels
Machines and Wheels will introduce the Drill 1600FF, a 5-axis CNC drilling machine designed for producing holes, inserts and countersinks on rectangular flat sheet glass with thickness of 3 millimeters to 20 mm. The machine is composed of five axes and two electropindles that create a double-sided drilling system for high-quality holes. Drill 1600FF is available in three sizes and can produce 104 shower doors per shift. User-friendly Optima software can be integrated into other systems. Booth #1863 336/373-0777 | MACHINESANDWHEELS.COM

04 / Mappi International
Mappi will promote its ATS 4.0 Eco Convection flat glass tempering furnace. ATS 4.0 is a user-friendly furnace that maximizes the production cycle and provides energy savings of up to 20 percent, according to the company. Computer-managed movements and heating reduce defects, and simplified startup operation cuts restart time to 1 hour, providing cost savings of up to 50 percent, according to the company. A Tab Service ensures 24-hour online assistance worldwide. Booth #2263 +(39) 06 9887-3284 | MAPPLI
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MACHINERY AND EQUIPMENT

01 / Matodi
Matodi will feature Neptun’s new Wave vertical washing machines. Wave features heavy duty stainless steel construction throughout. Advanced functions include Neptun’s SmartSpeed, which automatically adjusts conveyor speed for inline applications; EcoSave, for minimizing energy consumption; automatic water preheating; and NightCare, which automatically changes the water in the tank. The machines are completely Industry 4.0 compliant. Booth #1949
336/668-2300 | MATODI.BIZ

02 / TK srl
TK srl will promote Lamijet Convection, a multi-level oven for laminated glass with EVA, PVB or SentryGlas interlayers. The machine is manufactured in strong electro-welded metal frame, sandblasted and painted with epoxy enamel. The interior of the oven is protected with a paint for high temperatures up to 600 degrees Celsius. The oven features a multi-tray trolley positioned inside a single chamber. The modular system allows fast loading of the trolley for laminating or for heat soak processing. Booth #2469
+(39) 03 1357-4873 | TKITALY.COM

Viprotron (not pictured)
The Eco Scanner from Viprotron is an aftermarket quality scanner with an innovative and economical lighting system to allow users to identify basic defects in glass at a reduced price point. The system can be used to inspect glass for insulating or laminated glass production and can be set to inspect glass horizontally or vertically. The equipment allows for do-it-yourself installation and setup to save additional money and add to the value of the product investment. Booth #1908
+(49) 6157-9863-813 | VIPROTRON.COM

RAILINGS AND PARTITIONS

03 / Morse Industries
Morse Industries will debut its new adjustable glass dry glaze railing system. The new system allows the installer to adjust the glass. Customers can now attain glass panels that are perfectly aligned even if the shoe or substrate is out of plumb or level. Morse will also showcase its selection of glass railings. Booth #845
800/325-7513 | MORSEINDUSTRIES.COM
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BOOTH # 2363
RAILINGS AND PARTITIONS

BTS Aluminium (not pictured)
BTS Aluminium will exhibit its glass wall guillotine system. This system is a vertical sliding glass system that can be used in restaurants, cafes, hotels, and residential and industrial buildings. The Buralco guillotine glass wall system contains motorized and vertically-sliding panels controlled by a remote. The company will also exhibit its frameless glass railing systems, which provide the maximum amount of visibility, according to the company. Booth #338 +[90] 2128-7517-14 | BTSALUMINIUM.COM

Wagner Architectural
Wagner Architectural will exhibit Panel-Grip, its dry glaze glass railing system. The product’s durable locking mechanism and specially designed, lighter weight aluminum base shoe moulding allow for fast installation, the company reports. PanelGrip is a non-weld, modular rail system that does not require special tools.
or training to install. The product can be installed by one person on one side of the glass, and is ideal for balcony applications. Booth #838
414/214-8323 | WAGNERARCHITECTURAL.COM

SEALANTS AND ADHESIVES

02 / Gulf Rubber Industries
Gulf Rubber Industries will feature many of its rubber sealing profiles at GlassBuild America. Some of the products on display include: extruded dense/sponge EPDM, neoprene, SBR, silicone TPV, TPO profile, etc.; dual durometer profiles; continuous corner profiles; setting blocks; molded corners and parts; vulcanized frames; flame-retardant profiles; silicone compatible EPDM; self-adhesive profiles; rigid PVC; column guard; wall guard; and EPDM membrane. Gulf Rubber offers punching and cutting services and custom color matching. Booth #412
+(971) 4885-6171 | GRIGULF.COM

03 / Novagard Solutions
Novagard Solutions will debut its new Novaflex ultra-low migration glazing sealant and ultra-low migration high impact window/door sealant, both Miami Dade County Code-approved. These non-corrosive, single-component silicones cure upon exposure to atmospheric moisture, thus forming a tough silicone seal for window fenestration. Booth #812
216/881-8111 | NOVAGARD.COM

04 / tesa tape Inc.
Tesa tape’s ACXplus double-sided tape consists of a high-performance acrylic system for enhanced bonding power, stress dissipation, and temperature and weather resistance, company officials report. According to company officials, ACXplus offers powerful, long-lasting bonds, even between dissimilar materials; a fast application process, eliminating curing times and reducing complexity; clean production sites and healthy working environment; compensation for irregular or uneven surfaces; no mechanical weakening of substrates; sealing and protection against moisture and dust; and improved visual appearance, with no damage to substrates. Booth #1750
800/426-2181 | TESATAPE.COM

05 / Ultrafab Inc.
Ultrafab Inc. will display its multi-hollow bulb sealing technology in Las Vegas. During the early stages of compression, the seal requires minimal force; and at later stages of compression, the outer bulb makes contact with the inner bulb and closing forces build rapidly to provide high sealing pressure against the mating surface. This high sealing pressure is reportedly what makes the seal effective against air and water infiltration. The closing force does not fully ramp until the 25 percent compression phase. Three chambers are created that improve thermal and sound abatement properties. Booth #1446
585/924-2186 | ULTRAFAB.COM
SOFTWARE, TOOLS AND APPS

A+W Software (not pictured)
During GlassBuild America, attendees can test drive A+W iQuote on the company’s 55-inch touchscreen. In the demo, users can see how A+W iQuote dealer estimating and ordering software reflects current inventory and production schedules. No re-keying of data ensures accurate delivery dates and greater customer satisfaction, company officials report. Users can also create charts and reports, including IoT data, with A+W Acumen, a business intelligence solution that works with A+W Clarity and A+W Cantor software for glass, window and door fabricators. Booth #1119 336/686-3321 | A-W.COM

01 / Entelechy
Entelechy will showcase its pre-construction services for glazing contractors, including its virtual performance modeling. The company’s performance modeling helps to reinforce design, and the embedded information in the model allows the company to extract data tailored to each client’s needs, such as an optimized extrusion list, glass takeoff, material takeoff and frame count, including others. The files from this performance model can integrate with CAM software for CNC machining, and it is compliant with modern BIM requirements. Booth #1731 775/575-7006 | ENTELECHYCORP.COM

02 / GDS Estimating
GDS Estimating will showcase WinBidPro v15, its estimating software for commercial glaziers. The user-friendly software can easily create elevation drawings and reports for more than 20 different metal manufacturers, the company reports. EShower, a tool for drawing and quoting frameless shower enclosures, will also be on display. Booth #444 858/538-4375 | GDSESTIMATING.COM

Horst Klaes GmbH & Co. (not pictured)
Klaes develops software solutions for the fenestration and facade industries. For GlassBuild America attendees, Klaes will
showcase its solutions for companies of all sizes, including straightforward and flexible solutions for component trading to highly integrated and continuous ERP solutions for industrial production. Booth #1767
647/551-5222 | KLAES.COM

**03 / Mainstreet Computers Inc.**
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734/699-0025 | MAINSTREETCOMP.COM

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SOFTWARE, TOOLS AND APPS

OpenJanela LLC (not pictured)
OpenJanela LLC will debut its enhanced flagship enterprise software. The updated software now offers complete modules for customer relationship management, sales departments, dealers, service departments, enhanced purchasing and inventory control, as well as accounts receivable and seamless integration to modern account software. OpenJanela products are highly customizable and affordable to complement any type of industry business, company officials report. Booth #762 312/268-0021 | OPENJANELA.COM

Optima (not pictured)
Optima will showcase its Opty-Way Enterprise ERP system version 7.0, now available with a web-based dashboard for production and sales statistics information. It also offers an improved optimization module with the GMC-Monitor tracking system for barcodes, with direct connection to Cutting Table, Double Edger, Insulating Glass Assembling Line and Spacer Bender modules, and a 3D view of Delivery and Production Rack modules. Optima also added a new Delivery Rack-Editor module that manually edits the sequences of harp racks according to delivery rack sorting. Booth #2269 514/645-8998 | OPTIMA.IT

01 / Orgadata USA Inc.
The LogiKal configuration, estimating, take-off, project management and fabrication software system from Orgadata is specifically designed for the window, door, curtain wall and storefront industries. LogiKal features catalogs from most major commercial aluminum profile manufacturers and provides complete material take-offs, optimized cut lists, accurate glass reports, detailed fabrication drawings, elevation assembly road maps, part marking, CAD import/export and more. LogiKal also integrates with automated equipment for easy steering of stop saws/CNCs, reportedly reducing or eliminating programming time. ERP linking and custom database capabilities are available. Booth #1235 800/746-0641 | ORGADATA.US

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SOFTWARE, TOOLS AND APPS

Windowmaker Software (not pictured)
The latest Windowmaker software includes enhanced functionality for entrance doors, link to QuickBooks and many other features. Other key highlights include eCatalogs for composite door slabs and glass inserts, and the Windowmaker Measure app for Android/iOS smartphones and tablets. The enhanced version three of the app progresses from a measurement/survey tool to also become a quotation tool for window and door dealers, company officials report. Booth #122
416/762-5299 | WINDOWMAKER.COM

SPECIALTY GLASS

01 / Glassopolis
Glassopolis will debut the new Schott’s Pyran Platinum fire-rated glass. Produced using Schott’s micro-float process, the product is characterized by a smooth surface and neutral color. Pyran Platinum fire-rated glasses are certified by Underwriters Laboratories for fire-protection ratings up to 90 minutes in windows and 180 minutes in doors. Glassopolis offers sizes up to 51 by 99 inches, and can be contacted for immediate delivery. Booth #1615
800/262-9600 | GLASSOPOLIS.COM

02 / Safti First
Safti First will showcase its new SuperLite II-XLM clear butt-glazed walls. SuperLite II-XLM is a 45- to 120-minute, hose-stream tested, fire-resistive multi-laminate glazing that meets ASTM E-119/UL 263/NFPA 251 and CAN/ULC S101 and CPSC Cat. II impact safety. It is available in large sizes and can be used in all fire-rated 20/45/60/90/120-minute applications including clear fire-resistive butt-glazed applications up to 2 hours without vertical mullions or spacers. Booth #968
888/653-3333 | SAFTI.COM

STOREFRONTS AND ENTRANCES

03 / Arcadia Inc.
The Arcadia Group will showcase its aluminum storefront, curtain wall, windows and entrances. The company offers center-glazed and offset glazed storefront systems. Entrances include swing, sliding and bifold, among others. Arcadia’s architectural business development team maintains products that comply with the Leadership in Energy and Environmental Design for Core and Shell Rating System. Booth #365
323/771-9819 | ARCADIAINC.COM
SMART CLEANING MEETS SMART FUNCTION
SEAline Glass washer

Features & Benefit
- Various cleaning solutions: Roller brush / Disc brush, Bubble jet, Ultrasonic / Plasma
- Various inline application: RCA & O3 Cleaning, Developing / Etching / Striping
- Perfect Drying
- Particle free design

Visit us at
Glass Build America
Booth 2545
September, 12th - 14th, 2018
STOREFRONTS AND ENTRANCES

01 / Stylmark Inc.
Stylmark Inc. will exhibit its WallMaker interior glass wall system, which includes versatile interior storefront components. Extrusions are designed for ⅜-inch, ⅝-inch, ⅞-inch and ¾-inch glass or panels and may be ordered in standard 12-foot stock lengths or made-to-order lengths. Headers and sills are available in a variety of configurations to maximize design flexibility. The system also includes a line of mall front assemblies, glass clips, setting blocks and glazing to complete the installation. Booth #611 800/328-2495 | STYLMARK.COM

TOOLS AND SUPPLIES

02 / EDTM
EDTM will conduct live demonstrations of its product line throughout GlassBuild America, including its latest GC3001 Glass-Chek Pro. The GC3001 Glass-Chek Pro has all the abilities of the previous GC3000, with key improvements. The new product includes push-button control of the arrow keys, so the user can advance or revert to the previous result screen at will. The GC3001 also incorporates an easier menu system, allowing the user to change operating modes, units of measure, languages and screen advance speeds. The GC3001 Glass-Chek Pro now includes eight languages, and can identify a low-emissivity coating on a double pane window from a single side. Booth #1663 419/861-1030 | EDTM.COM
WELCOME TO THE
ITALIAN ADVANCED
TECHNOLOGY PAVILION AT

GlassBuild

Las Vegas, Nevada, USA / September 12-14, 2018

HALL N-2, LAS VEGAS CONVENTION CENTER:

ADELIO LATTUADA
Booth 2363

ADI - IGP
Booth 2163

BOTTERO
Booth 2173

BOVONE
Booth 2574

CUGHER GLASS
Booth 2263

ITA, GIMAV, VITRUM
Booth 2463

MACOTEC
Booth 2563

MAPPI AMERICA
Booth 2263

MOLE
Moreschi
Booth 2569

OPTIMA
Booth 2269

SCHIATTI ANGELO
Booth 2663

STAR
Booth 2169

TK PURA
TECNOLOGIA
ITALIANA
Booth 2469

TRIULZI CESARE
SPECIAL EQUIPMENTS
Booth 2562
01 / Spray-X
Spray-X foaming glass cleaner offers industrial strength cleaning power in a non-ammoniated formula, designed to provide a crystal-clear shine. It has a pleasant scent and can be sprayed in any position, company officials report. Safe on film, tint and plastics, Spray-X is available in 19-ounce, 15-ounce and 10-ounce sizes. Private label is available in 19-ounce and 4-ounce sizes. Booth #1350
888/877-7299 | SPRAY-X.COM

02 / Trim-Lok Inc.
Trim-Lok’s rubber seals are made from custom formulated EPDM closed cellular sponge. They are available in a variety of specially designed profiles, including “D” and “P” shapes, triangles, ribbed profiles, flaps and corner profiles. Custom shapes and custom material specifications are also available. Booth #944
888/874-6565 | TRIMLOK.COM

03 / U.S. Tsubaki/KabelSchelpp
TKA series cable and hose carriers from U.S. Tsubaki are available in inside heights from 20 ½ to 45 millimeters and inside widths from 15 to 250 mm. They offer travel length gliding up to 150 meters, travel speed up to 9 meters per second and travel acceleration up to 45 m/s. The company’s carriers offer chipping and dirt resistance, extensive self-supporting lengths, high torsional rigidity, ideal ratio of inner to outer width, low noise emissions, easy assembly and fast cable installation. The company also customizes material types for specific applications. Booth #2644
800/323-7790 | USTSUBAKI.COM

04 / Combilift USA
Combilift USA will exhibit its Combilift C series and CB series. The C-Series is the company’s original multi-directional forklift. This range of trucks is designed to handle long and specialized loads, with a capacity of over 5,500 pounds. The Combi-CB range is a range of counterbalance forklift trucks that are more compact. Applications include transporting goods such as palletized loads, with the added advantage of having the ability to carry long loads in sideways mode. Booth #1847
877/286-2456 | COMBILIFT.COM
TRANSPORTATION AND HANDLING

01 / Dr. Gold & Goldanco
Carrymate Safety Grips for lifting and carrying glass, metal, windows, doors and more, can handle widths up to 6.3 inches, and weights of up to 440 pounds per pair. Reducing back strain and improving productivity, they are available for two and up to four users with the T-Grips. All parts that touch the load are covered with a special coating to protect glass. The grips are endorsed by international health and safety agencies. Booth #1174
702/974-1623 | CARRYMATE.COM

02 / Ergo Robotics
Ergo Robotics will debut its new Plum- bLine-2200, a new lightweight under- hook glass lifter. The product allows up to a 2,200-pound load to be set safely with wireless controls. The PlumbLine is compact, allowing users to have hydraulic controls in tight spaces of as little as 4 feet. The PlumbLine is also lightweight, weighing around 850 pounds. Booth #1827
518/409-8810 | ERGOROBOTIC.COM

03 / F. Barkow
F. Barkow will debut its new Barkow 9-foot Workhorse enclosed glass truck with bulkhead toolbox and interior rack with roller bar. The exterior comes equipped with aluminum glass carriers, 108 inches in overall length and 96 inches in useable height. The exterior also features six stakes, equipped with Stake-Loc, self-locking stakes, and full-height walk-in locking rear doors. The truck’s interior features a dome light and Easy Rider roller bar at the rear designed to help load and unload glass onto an interior rack. Booth #1241
800/558-5580 | BARKOW.COM

04 / Kundel Industries Inc.
Kundel’s lifting devices move products with accuracy and ease, company officials report. With the Quick-Lift System, users can easily adapt lifting solutions to fit unique conditions, due to the system’s built-in functionalities. The ergonomic lifting systems are engineered to intelligently work in challenging conditions.
Kundel also offers a range of vacuum-driven grippers to ensure safe and smooth handling within glass plants. It will have a range of products on display in Las Vegas. Booth #2635
330/259-9009 | KUNDEL.COM

05 / Manitex Valla
Manitex Valla will introduce its new Valla 19 E Series crane. The product has a maximum capacity of 1,990 pounds while still capable of lifting its boom over 15 feet with a capacity of nearly 900 lbs. Features include an LMI system to ensure safety, and a high-speed winch to improve efficiency at the job site. Booth #1068
708/237-2079 | MANITEXVALLA.COM

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708/237-2079 | MANITEXVALLA.COM

NEW

05 / Prodim
Prodim offers a range of digital measuring solutions for the glass industry. They can measure on-site or in the factory, providing tools and software for doors and windows, physical templates, floors, shower cabins, splashbacks, facades, balustrades, skylights, monumental works, and many more. See them at GlassBuild America, booth 1909.

www.Prodim-Systems.com
TRANSPORTATION AND HANDLING

**Quattrolifts USA (not pictured)**
Quattrolifts USA will debut three new products in Las Vegas. The Express 770 CWA, a portable battery-driven machine, allows one or two people to lift, transport and glaze lites weighing up to 770 pounds. It is a modular system for easy loading and assembly, offers a small footprint—32 inches by 40 inches—and works in confined areas. The Express 440 CW is the non-powered version of the 770 that offers the same versatility for up to 440 pounds of glass. For glazing at height from a lull or telehandler, Quattrolifts is releasing the Omni 1750. Booth #517 702/566-5841 | QUATTROLIFTS.COM

**ReachMaster Inc.**
ReachMaster’s Winlet self-propelled glass manipulators reportedly handle and move glass from production floor to on-site installations safely and efficiently, using dual independent suction systems. Battery-driven hydraulics offer increased strength and proportional movement, and remote control allows users to work where the glass is. ReachMaster offers Winlet models from 770-pound to 2,200-pound capacity. Booth #1633 281/358-7088 | REACHMASTER.COM

**SmartLift US**
SmartLift US will showcase its SL 380 Outdoor High Lifter, part of its line of mobile glass manipulators. The lifter is designed for jobs that require longer reach and lifting height. Applications include replacing windows in an end wall. Features include two vacuum circuits with two pumps, a lifting height of 110 inches, and dual rear wheels that make the product maneuverable. SmartLift Equipment provides users with the precision needed to install all types of glass, the company reports. Booth #1215 815/931-4825 | SMARTLIFTUS.COM

**Spider by BrandSafway**
Spider by BrandSafway will showcase its Spider Dual Monorail System, a suspension solution system. The product allows installers to precisely position curtain wall units horizontally and vertically. The system offers a complete solution, providing continuous, horizontal mobility for swing stages and material hoists around a structure’s perimeter. Easy to assemble, its universal 6-inch by 8-inch I-beams can support up to 3,000 pounds and are used for both the monorail and outrigger support, eliminating the need for special parts. Booth #1215 877/774-3370 | SPIDERSTAGING.COM
Palmer SuperSet Mirro-Mastic® is a low VOC, solvent-free adhesive mastic formulated for adhering acrylic and glass mirror to various substrates such as drywall, glass, metal or tile. SuperSet cures to a strong permanent bond that will not shrink and become hard and brittle with age. SuperSet qualifies for LEED® Green Building Rating System™ credit.

See us at GlassBuild America, booth 814.
TRANSPORTATION AND HANDLING

01 / Weldco Sales Inc.
Weldco Sales Inc. will introduce the LumberJack Metal Carrier. Integrating the traditional lumber rack design with Weldco’s goal post metal carrier, the company has engineered a utility body for basic construction needs with superior quality, says Weldco. Constructed from high-grade steel, the product is durable and each rack is custom-built for the customer’s choice of vehicle. Booth #1775
800/452-7875 | GLASTRK.COM

WINDOWS

02 / Chelsea Building Products
Chelsea’s inoview window platform is designed to increase thermal performance with nearly any insulating glass package. Multi-hollow profiles are engineered to align the mainframe and sash for increased weld strength while maximizing thermal performance, eliminating the need for foam filling, company officials report. Chelsea engineered inoview windows to exceed NFRC and Energy Star test standards, offering a .14 U-value. The multi-hollow profiles are engineered to ensure thermal, structural, water, air and sound performance. Booth #1263
412/826-8077 | CHELSEABUILDINGPRODUCTS.COM
SUCCESS. DELIVERED.

Visit SALEM Flat Glass & Mirror at GlassBuild America 2018 in BOOTH #2763 and see these machines and more from exclusive industry partners!

**ADVANCE** Vertical CNC Work Center

Discover the most compact, hi-tech vertical CNC work center in the industry – the **DENVER ADVANCE**. This all-in-one, true vertical alternative to horizontal work centers is capable of edging, notching, countersinking and polishing (optional). Ideal for "quick turnaround" production, this **zero set up** machine has 100% uptime with its continuous "flow" capability.

**ELB 10/45** Edger/Miterer | **ELB 102** Edger

The **ELB 10/45** is designed to produce flat edges or 0° to 45° miters, both cerium polished, and has a two wheel arris polish configuration. The **ELB 102** produces high quality flat polished edges with cerium bonded wheels. These 10 cup wheel edgers are **industry heavyweights** in their class and are able to handle up to 2,000 lb lites.

**صلاحِ مِلْتُو**

Drop by **BOOTH #2763** and see live machine demonstrations and browse our displays featuring a full line of tools, supplies and material handling equipment.

- From **SALEM** and our partners – **BDrills**, **RBM ITALIA**, **WOOD’S POWR-GRIP** and more.
- Products include diamond wheels, core drills, felt and composition polishing wheels, cerium oxide polishing compounds, CNC tooling, vacuum cups, vacuum lifters and more.

**SALEM Flat Glass & Mirror**

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www.salemdist.com

**NORTH CAROLINA**

800.234.1982

**CANADA**

844.858.7444

CALL SALEM TODAY – Ask us about equipment from these additional industry partners!
<table>
<thead>
<tr>
<th>EVENT</th>
<th>DATE</th>
<th>TIME</th>
<th>LOCATION</th>
<th>NOTES</th>
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</thead>
<tbody>
<tr>
<td><strong>REGISTRATION</strong></td>
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<tr>
<td>Monday, Sept. 10</td>
<td>1:00 pm – 4:00 pm</td>
<td>Exhibitor VIP Badge Pick-up</td>
<td>9:00 am – 4:00 pm</td>
<td>Exhibitor Only - Exhibitor VIP Badge Pick-up</td>
</tr>
<tr>
<td>Tuesday, Sept. 11</td>
<td>9:00 am – 4:00 pm</td>
<td>Exhibitor Registration &amp; VIP Badge Pick-up</td>
<td>9:00 am – 4:00 pm</td>
<td>Fall Conference 8:00 am – 6:30 pm Las Vegas Convention Center Separate registration required.</td>
</tr>
<tr>
<td>Wednesday, Sept. 12</td>
<td>8:00 am – 6:30 pm</td>
<td>Fall Conference 8:00 am – 6:30 pm Las Vegas Convention Center Separate registration required.</td>
<td>11:30 am – 5:00 pm</td>
<td>13th Annual Glazing Executives Forum 8:00 am – 6:30 pm Las Vegas Convention Center Separate registration required.</td>
</tr>
<tr>
<td>Thursday, Sept. 13</td>
<td>7:30 am – 4:00 pm</td>
<td>Registration Open 8:00 am – 6:30 pm</td>
<td>10:00 am – 5:00 pm</td>
<td>Express Learning 11:00 am – 5:00 pm Express Learning Theater / Booth 913 Free to all registered attendees.</td>
</tr>
<tr>
<td>Friday, Sept. 14</td>
<td>8:00 am – 1:00 pm</td>
<td>Action Demonstrations 10:30 am – 4:30 pm Exhibit Hall Free to all registered attendees.</td>
<td>10:00 am – 2:00 pm</td>
<td>GlassBuild Opening Reception 5:00 pm – 6:30 pm Trade show floor – North Halls N1 - N4 Attendees can meet with friends and colleagues while enjoying refreshments, live entertainment and fun activities on the trade show floor. Free to all registered attendees.</td>
</tr>
<tr>
<td><strong>EXHIBIT HALL</strong></td>
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<td>10:00 am – 2:00 pm</td>
<td>Registration Open 7:30 am – 4:00 pm</td>
<td>10:00 am – 6:30 pm</td>
<td>Free to all registered attendees.</td>
</tr>
</tbody>
</table>
FRIDAY, SEPT. 14

Registration Open
8:00 am – 1:00 pm

Fall Conference
7:00 am – 9:00 am
Las Vegas Convention Center
Separate registration required.

Exhibit Hall Open
10:00 am – 2:00 pm

Express Learning
10:30 am – 12:00 pm
Express Learning Theater / Booth 913
Free to all registered attendees.

Action Demonstrations
10:30 am – 12:00 pm
Exhibit Hall
Free to all registered attendees.

GLAZING EXECUTIVES FORUM*

*As of July 2. Schedule is subject to change. For the most up-to-date schedule, visit GlassBuildAmerica.com.

Glazing professionals from around the country will gather in Las Vegas on Sept. 12, 2018, for the 13th annual Glazing Executives Forum. Hosted by the National Glass Association, glass.org, and held in conjunction with GlassBuild America, this full-day education and networking event will present a dynamic program highlighting Strategies for Smart Growth.

OUR PASSION IS TO MAKE BETTER SOLUTIONS.

CTF

INNOVATIVE CTF-SERIES PUSH THE BOUNDARIES OF EXCELLENCE

CTF Furnaces’ enables unlimited product length with optimal and even heating/cooling capability for every size and thickness of glass.

SGBFi

WINDSHIELD FURNACE FOR HIGH CAPACITY PRODUCTION

SGBFi has full surface shape control, excellent control of cooling and high repeatability. Cycle time reduced down to 25s.
With many companies seeking to capitalize on growing demand, this year’s forum will help glazing company owners and managers grow profits, expand their reach and lay the foundation for long-term success. All events take place at the Las Vegas Convention Center, unless otherwise noted. Separate registration required. The full-day program includes breakfast and lunch, plus admission to the GlassBuild America trade show floor and Opening Reception.

**Wednesday, Sept. 12**

8:00 am - 10:00 am
**Installing Committee meeting / Building Envelope Contractors**
Attendees will have an opportunity to join in discussions to help define industry standards and elevate design and construction communities by creating the expertise that advances the use of architectural glass. Continental breakfast included.

10:00 am - 10:15 am
**Welcome and Introductions**

10:15 am - 11:15 am
**Navigating the Supply Chain: A Panel Discussion**
Increased demand has added pressure to the glass industry supply chain. This discussion will offer practical solutions to top-of-mind supply management challenges such as lead times and transportation.

11:15 am – 11:30 am
**Networking break**

11:30 am – 1:00 pm
**Ask the Expert Presentations**
Led by industry experts in their respective fields, these presentations will address the leading business concerns of today’s contract glaziers. Topics will include:

— **Exit Planning and Succession**  
  **Presented by Kevin Kennedy and Joe Bazzano of Beacon Exit Planning LLC**
— **Employee Recruitment Tactics**  
  **Presented by Dustin Anderson, Anderson Glass**
— **How to Get Paid**  
  **Presented by Matt Johnson, Gary Law Group**
— **Managing Cash Flow**  
  **Presented by Marco Terry, Commercial Capital LLC**

1:00 pm - 2:00 pm
**Networking lunch**

2:00 pm – 3:00 pm
**Interactive Breakout Sessions**
Attendees will have the opportunity to participate in Q&A and coaching sessions with the industry experts of their choice.

3:00 pm – 3:15 pm
**Networking break**

3:15 pm – 4:15 pm
**Annual Economic Forecast**  
**Presented by Connor Lokar, ITR Economics**
This energetic and informative session will offer analysis of business-cycle trends with a focus on the construction industry to help glazing company executives plan for the future.

4:15 pm – 5:00 pm
**GlassBuild America Trade Show Floor**
All attendees receive complimentary access to the GlassBuild America trade show floor as part of their registration.

5:00 pm – 6:30 pm
**Opening Welcome Reception on the GlassBuild America Trade Show Floor**

**EXPRESS LEARNING**

*As of July 2. Schedule is subject to change. For the most up-to-date schedule, visit GlassBuildAmerica.com.

These popular TED Talks-style educational sessions will focus on practical business strategies to help build more profitable businesses throughout all parts of the industry. All sessions are conveniently held in the Express Learning Theater, located in the Exhibit Hall / Booth #913.

**Wednesday, Sept. 12**

11:30 am
**MyGlassClass.com: Make Online Training Work for You**  
**Presented by education and training staff of the National Glass Association, glass.org.**
For the past several years, the glass and glazing industry has pointed to the skilled labor shortage as one of its greatest challenges, increasing the need for accessible, high-quality education and training. NGA is addressing this need by offering a new, robust online glazier training curriculum for full-service glass companies and contract glaziers. Learn how it can benefit you in this interactive session.

1:30 pm
**The Economic Forecast**  
**Presented by Connor Lokar, economist at ITR Economics, itr economics.com.**
Specializing in economic analysis and forecasting for construction-based clients, economist Connor Lokar will present a report on the health and performance of the U.S. economy, in addition to economic forecast highlights, to help GlassBuild America attendees plan for the future.

2:30 pm
**How to Use Social Media the Right Way**  
**Presented by Max Perilstein, founder and managing partner of Sole Source Consultants, salesourceconsultants.com.**
While social media can be a critical element of marketing and connecting with customers, it is not without its pitfalls and
Glass Replacement Made Easy

The NEW & IMPROVED Model # GC3001

* New Robust LCD Display
* New Menu System
* New Higher Precision Laser
* New Welcome Screen Reminder
* New Membrane Switch Front Panel
* New Screen Advance Control Buttons
* New & Improved Low-E Detection
* 2 New Languages: Danish & Swedish

Glass-Chek PRO vs. Glass-Chek ELITE

<table>
<thead>
<tr>
<th>Feature</th>
<th>GC3001</th>
<th>GC3200</th>
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</thead>
<tbody>
<tr>
<td>Triple Pane Glass Thickness Measurement</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Compatible with ALL Low-E Coatings</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Expanded 2.0&quot; Overall Thickness Range</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Differentiate Between Hard Coat and Soft Coat Low-E</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Detect Single, Double, Triple Silver Hard Coat &amp; Surface 4 Low-E</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Determine Number of Soft Coat Silver Layers</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Low Battery Indicator</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Graphical Display with Window Illustrations</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Laminated Glass Identification &amp; PVB Thickness Measurement</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Determine Whether Coating is Present on Surface 3 or 4</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Modes for Bullet Resistance, Reflective, Suspended Film, and More!</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Ability to Store 30 Measurements</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

Award Winning: Glass-Chek ELITE

- Identify & Measure Laminated glass in a Window
- New Graphical Display with Window Illustrations
- Determine Glass Thickness & Identify Low-E Coating Type
- Expanded Applications for Multi-Laminate, Suspended Film, Reflective Glass, Dark Tints, & Bullet Resistance
- Replace IG’s with the Correct Low-E
- Able to store 30 Measurements

Low-E Detectors You Can Trust

Model # AE1601

- The “ETEKT+” Double Pane Low-E Detector has been the industry standard detector for over 25 years.
- Detect Coatings on dual pane windows

Model # AE3600

- The Single Pane Low-E Detector is designed for rigorous factory settings.
- Check both surfaces of the nearest pane of glass with a single test.

Made in the USA

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See us at GlassBuild America, booth 1663.
dangers. This session explores the best social media platforms for various types of glass industry businesses and offers critical dos and don’ts of using social media.

3:30 pm  
**How to Get Paid on Time, Every Time**  
An attorney specializing in legal and risk issues facing manufacturers of glazing and fenestration products, Matt Johnson will cover how industry businesses can successfully navigate contracts and legal issues to get paid on time, every time.

4:30 pm  
**How to Manage Cash Flow for Smart Growth**  
No one is immune to cash flow problems. Marco Terry helps clients manage invoicing and financing to maintain growth while paying the bills on time. In this session, he will walk through how to manage cash flow for smooth operation and smart growth.

**Thursday, Sept. 13**

1:30 pm  
**How to Recruit and Retain Employees Through Online Industry Promotion**  
As business owners and top leaders are retiring, it is imperative for companies to attract the younger generation into the industry. Dustin Anderson will share tips and best practices for using branding, social media and targeted digital advertising to attract new employees and set the industry up for success into the future.

2:30 pm  
**Navigating the Challenges of Exit Planning and Succession**  
The exit process is fraught with roadblocks, and fewer than 30 percent of businesses will actually succeed in transferring ownership. Session attendees will learn about the primary hurdles in succession and exit planning, receive guidance on how to begin the succession and exit process, and learn from the real-life succession story of glazing company Giroux Glass.

3:30 pm  
**How to Recruit and Retain Employees Through Online Industry Promotion**  

4:30 pm  
**Navigating the Challenges of Exit Planning and Succession**  

**Friday, Sept. 14**

10:30 am  
**MyGlassClass.com: Make Online Training Work for You**  
Presented by education and training staff of the National Glass Association, glass.org.

11:30 am  
**How to Use Social Media the Right Way**  
Smart design is transparent.

You can trust dormakaba glass systems for contemporary design solutions that give clarity to open workspace design. Our solutions comprise essential specialty hardware for swing and sliding glass door applications and operable glass wall systems to create collaborative work environments. **Smart design begins at dormakaba.**

For comprehensive project support, call 844-773-2669.

DORMA and KABA are now dormakaba. Visit dormakaba.us
### THE EXHIBITORS

COMPANIES TO SEE IN LAS VEGAS. LIST AS OF PRESS TIME, JUNE 29, 2018, AND SUBJECT TO CHANGE. FOR AN UPDATED LIST AND INTERACTIVE EXHIBITOR FLOORPLAN, VISIT GLASSBUILDAMERICA.COM.

<table>
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<tr>
<th>Exhibiting as of June 29, 2018</th>
<th>Booth #</th>
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<td>A+W Software</td>
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<td>AAMA</td>
<td>927</td>
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<td>ABC Hardware Inc.</td>
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<td>Access Hardware Supply</td>
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<td>ADI SPA - IGP INC.</td>
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See us at GlassBuild America, booth 2649.

Dimension

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<td>Air Supply</td>
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<td>Total Power</td>
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<td>Double Glazing, Triple Glazing</td>
<td>4m (L) x 4m (W) x 3m (H)</td>
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<td>Washing Speed</td>
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Max Load

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<td>Max IG Thickness</td>
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<tr>
<td>Glass Thickness</td>
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<td>Minimal Size</td>
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<td>Maximum Size</td>
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Technical Data:

- Washing
- Inspection
- Spacer Application
- Gas Filling & Pressing
- Hot Melt Sealer

Installing Glass Line

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EVOLUTION OF GREEN BUILDING
“GREEN” doesn’t mean what it did 10 to 15 years ago. The green building movement, which previously was focused on energy, has expanded to include considerations of sustainability, recyclability, life cycle, wellness and more. Discussion of individual product performance has transitioned to consideration of full-system and full-building performance.

This evolution has changed what “going green” means for glass companies and the entire glass industry. Companies face tougher codes and standards, demands for more detailed product performance data, increasingly complex project processes and more.

This article explores the new world of green building, tracking trends to watch and what they mean for industry companies. It presents key terms and definitions and addresses common myths about glass and glazing performance.

Left: High-performance glass creates a wave-like façade that encloses the 38-story Anaha Tower in Honolulu. The building, designed by Solomon Cordwell Buenz, scb.com, in partnership with Benjamin Woo Architects, benwooarchitects.com, features 275,000 square feet of Guardian Glass, guardianglass.com, SunGuard SNR 43 coating on CrystalGray glass, 20,000 square feet of which is bent glass. The podium features 50,000 square feet of Guardian SunGuard SuperNeutral 68 coating on low-iron glass. These makeups met the requested solar heat gain coefficient and visible light transmission requirements.

The project is designed to achieve a LEED silver rating from the U.S. Green Building Council’s Leadership in Energy and Environmental Design program. The high-performance glass contributed to LEED certification in several categories, including the Energy and Atmosphere credit to optimize energy performance, increasing energy performance above the prerequisite standard, reducing the environmental impact of excessive energy use. Additionally, the building’s floor-to-ceiling windows allow for abundant natural light to come into interior spaces, which could contribute to the Indoor Environmental Quality credit for daylight for 75 percent of spaces.


Photo by Marco Garcia.
1. Life cycle over energy efficiency.
Ten years ago, the focus of green performance for glass and glazing was often measured in terms of thermal and energy efficiency. The movement has evolved, taking on a more holistic and long-term approach, with a focus on sustainability and life cycle.


“We became myopic about energy—the energy consumed during building operations. ... Now we are starting to think in terms of life cycle,” adds Mic Patterson, director of strategic development for Schüco USA, schueco.com.

“When we consider how we create a sustainable built environment, we need to be talking about fundamental issues like life cycle, durability. We’ve made progress, but there is a long way to go.”

2. Demand for product transparency.
The increased focus on life cycle corresponds with demand for product transparency, primarily environmental product declarations. EPDs disclose the life cycle environmental performance of a product. They are developed during a life cycle assessment process, in which the environmental impact of component parts is measured according to product category rules. (See definitions of life cycle terminology at right.)

Some architects and owners are also seeking health product declarations, HPDs, which disclose the content and associated health information for building products and materials. An HPD offers information on product chemical content and potential health hazards.

“We’re not seeing heavy demand for EPD and HPD yet, but it is working its way through our world,” says Perilstein.

Industry officials say they expect to see increased demands for product declarations, particularly EPDs, as more rating programs and building code requirements seek building product environmental disclosures.

3. Tougher building and product requirements.
Building energy codes continue to become more stringent. (Read the Codes & Standards article on page 20 for details of the 2019 version of ASHRAE 90.1.) Several jurisdictions, such as California and Seattle, have adopted their own regulations that up the performance requirements even further. In October 2017, for example, California Governor Jerry Brown signed into law the Buy Clean California Act, which sets maximum levels of embodied carbon emissions for building materials used in state infrastructure projects. “The new act means there is a life cycle assessment that has to be
LIFE CYCLE DEFINITIONS

**Life Cycle Assessment:** An LCA addresses the embodied energy/carbon footprint of a product, taking into account factors such as acidification, fossil fuel depletion and human toxicity.

**Embodied energy:** Embodied energy is the total energy consumption from a building material’s extraction, processing, manufacturing and delivery.

**Product Category Rule:** The PCR scopes and sets rules for conducting the Life Cycle Assessment. The PCR ensures every company measures the impacts of a product in the same way.

**Environmental Product Declaration:** An EPD discloses the life cycle environmental performance of a product. (The labels are similar to the nutrition labels for the food industry.)

Source: Definitions derived from the presentation “Eco-labeling is Coming: Is the Glazing Industry Ready?” by Helen Sanders, strategic business development, Technoform Glass Insulation NA Inc., technoform.us.

Above: Wausau Window and Wall Systems, wausauwindow.com, supplied the window, entrance and unitized curtain wall systems for Portland, Oregon’s new LEED Gold Slate project. Wausau officials became involved early in the process to ensure the façade met the design team’s energy performance and aesthetic requirements. To meet project goals for energy efficiency and occupant comfort, Wausau’s aluminum-framed products have been thermally improved by Linetec, linctec.com, using a polyamide barrier. Combining the thermal barrier with solar-control, low-emissivity, insulating glass achieves the specified performance for low solar heat gain coefficient, low U-Factor, high condensation resistance factor and high visible light transmittance, according to Wausau officials. Seasonal opportunities for natural ventilation also help reduce the demand on HVAC systems and associated energy use.

The project was designed by Works Progress Architecture, worksarchitecture.net. Yorke & Curtis Inc., yorkeandcurtis.com, served as general contractor and Dallas Glass, dallasglass.net, as glazing contractor. The glass manufacturer was Vitro Architectural Glass, vitroglazings.com. Firestone Building Products Co., firestonebpco.com, supplied the metal panel inserts.

considered in state procurement,” Patterson says.

According to BuyCleanCalifornia.org, “The State of California spends more than $10 billion annually on infrastructure projects, such as bridges, roads and state facilities. Beginning in 2019, Buy Clean will require contractors who bid on state infrastructure projects to disclose the greenhouse gas emissions data for certain materials they use in these facilities, such as steel and glass.”

4. Moving beyond LEED.
A key driver in the green building movement has been the U.S. Green Building Council’s Leadership in Energy and Environmental Design program. While LEED continues to be a key player among green building rating programs, the field has widened, allowing architects to consider different metrics when evaluating the performance of their buildings. Key rating programs include the Well Building Standard, Living Building Challenge, Passive House and Green Globes.

“LEED is no longer the only game in town,” says Perilstein. “[Architects] are interested in programs that factor in healthy buildings, and anything with net zero.”

Higher performance expectations mean glass companies increasingly will be asked to look beyond traditional glass and glazing systems. “The energy codes and standards require higher glass performance, and a 1-inch standard double pane insulating glass unit may not be sufficient. Fabricators and glaziers are asking how to improve glass thermal performance and satisfy the code requirements,” says Chia-Ling Yuan, Northeast regional technical advisor for Guardian Glass, guardianglass.com.

Triple glazed IGUs, fourth surface low-emissivity coatings and framing systems with additional thermal breaks may be required to meet the next update to energy codes. (See the Codes & Standards article on page 20 for a more complete breakdown of product requirements.)

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6. Emergence of new materials.
Tougher requirements could also lead to the emergence of different materials in glass and glazing systems. Timber curtain wall, for example, has become more common on commercial projects. “Wood is lower in embodied carbon,” Patterson says. “We are seeing mass timber. We’re seeing opportunities for wood curtain wall units.”

On the glass side, products such as vacuum insulating units could begin to penetrate the industry in a more meaningful way. “Using a vacuum between two panes of glass that prevents heat from escaping to the outside, [vacuum insulating glass] ... insulates like a wall,” says Yuan. “The product provides transformative thermal insulation with an R-value of up to 12 for 8-millimeter thickness, compared to single pane glass at R-1.” Guardian Glass recently debuted Guardian Vacuum IG to meet these high-performance demands.

7. Eye on renovation and retrofit.
Commercial and residential buildings constitute about 40 percent of all energy use in the United States. Improving energy performance in the existing building stock could go a long way in reducing overall building energy consumption, says Perlstein. “The biggest problem is our older buildings—buildings built in the late 80s and early 90s before anyone was putting in low-E,” he says.

Renovation and retrofit, however, can be an expensive proposition. “The biggest problem is that these buildings fail to anticipate the need for future retrofit,” Patterson says. “We are left with very few options when it comes to renovating. The cheapest thing to do is strip off the entire façade and put up a new one. This is wasteful, expensive and very disruptive to ongoing building operations.”

The building industry should begin to consider retrofit when designing projects and products. “We need to design for replacement,” says Tom Culp, owner of Birch Point Consulting.

8. Integrated project delivery.
Achieving higher performance expectations requires a shift in project delivery. Early communication and collaboration are critical, particularly as project teams work to develop whole-building performance solutions. “What is central to the effort are collaborative delivery strategies—design assist, integrated project delivery,” Patterson says.

Yuan agrees. “Guardian Glass recommends that architects and design teams adopt the integrated design process for designing high-performance buildings. IDP is a holistic approach that requires the whole project team to think of the entire building and all of its systems together, which means the team is working collaboratively to implement sustainability goals,” she says. “Applied during the early project stage, building performance analysis tools such as energy modeling, daylight modeling, thermal comfort modeling and heat transfer analysis are all critical to helping the team select the appropriate glass products.”

MYTHS AND MISCONCEPTIONS

Myth 1: Glass is the weak link.
“Architects often consider glazing to be a major source of thermal gains and losses, which increases building energy consumption. However, with the right glazing products, building orientation, window-to-wall ratio and shading elements, the glass façade can effectively control environmental factors such as heat, light and sound,” says Guardian’s Yuan.

Myth 2: Glass performance trumps frame and system performance.
The focus on glass performance often overshadows attention to frame and whole-system performance. “The glass industry did just about everything to improve the glass. Ultimately, the performance improvements became increasingly limited,” says Patterson. “There is a tendency to overlook what is going on in the façade. Contractors resist thermal breaks. Installation problems are overlooked.”

Myth 3: Center of glass performance numbers are all that is needed.
The laser focus on glass extends to performance calculations. Many in the building industry rely on the center of glass U-factor measurements to calculate performance of a full system, sources say. However, the COG number relates only to the glass, not the system. “People are finally starting to realize that you can’t use the glass-only number to calculate the U-factor of the whole assembly,” says Culp. (Read the column on page 28 on the importance of edge of glass performance.)

Myth 4: When performance lags, the problem is the product.
When a glazing product or full façade doesn’t perform as expected on a project, “the finger of blame tends to strongly point at the glass,” says Patterson. The problem, however, can stem from any number of areas, from installation errors, to poor system design or integration, to lack of orientation considerations in design. Looking at the whole system and how it relates to the whole building can help a project team identify problem areas, ideally before a project is built. “I think the industry needs to take on the whole façade when it comes to educating the design and building community,” Patterson says.

NEXT STEPS

For the glass and glazing industry to be successful in the green building future, innovation is critical, says Patterson. “The only way to create a sustainable built environment is through massive innovation,” he says. “We are a risk averse industry. But, we need to understand the limits of the industry, embrace the constraints, and focus on innovation. We need to experiment more, do more faster. ... The more we can demonstrate that we can manage innovative processes and manage innovation materials, the more successful we’re going to be.”

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Introduction to Estimating

Seven steps to an accurate project bid, for new estimators By Melissa Fischer

For a contract glazing firm, a bid estimate can make or break a project. An estimate that is too high can cost a bidder the job, while one that is too low or omits elements of a job can cut into margins and affect overall company profitability. “If a project is underbid, all subcontractors, not just the glaziers, are placing themselves in quite the predicament,” says Chuck Knickerbocker, curtain wall manager, Technical Glass Products, fireglass.com. “If something is missed in the estimate and it is contractually obligated to be delivered, the glazier is essentially giving it away for free. This not only has the potential to negatively impact their bottom line for the project in question, but also for the company as a whole.”

Getting the estimate right, however, is a challenge. Bidding companies must consider every potential material and equipment cost, every person-hour it will take to fully complete the job and related costs, such as potential taxes. “Not only does an accurate estimate set the baseline for project costs, such as material and labor, it also sets the scope of work the glazier is committed to perform,” says Knickerbocker. “Essentially, it’s the first chance on any job to get it right. If the estimate’s wrong, they will pay the price of it being wrong the whole job through.”

“Estimating is both science and art,” adds Ted Derby, project manager, Intertek Building Sciences Group, Intertek, intertek.com. “A real understanding of any project is needed quickly and as complete as possible. Through this real understanding comes accuracy and profitability.”

This article, the first in Glass Magazine’s Glaziers’ Toolbox series, provides glazing subcontractors with introductory tips for accurate project estimates to help companies avoid financial curveballs once a bid is won.

If the blueprints or plans are lacking necessary details, don’t guesstimate. Seek out confirmation from the architect through bid requests for information, or make sure unresolved questions are qualified in bid documents.

When dimensions are not provided, do not scale the drawings in an attempt to determine the dimensions not furnished. While this may result in an adequate dimension, the risk is completely on the person doing the scaling, namely the estimator. Inaccuracies can lead to over- or under-estimating areas and sizes of windows, thereby affecting scope and estimated costs.
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Make sure material takeoffs are accurate. If the dimensions of a window are wrong, or the number of windows actually required is more than the estimate, a bid will end up being low, the job costs will exceed the estimated costs, and the company will lose money. On the other hand, if the estimate includes more windows than are required, the bid may be higher than a more accurate bid prepared by a competitor, meaning the competitor will win the job by having the lower bid.

Prices change. An estimator must keep on top of market conditions to correctly determine material costs, and the pay climate in order to identify accurate rates for laborers and craftsmen, making sure to factor in all federal and state payroll costs as well.

It’s easy to forget things when there is so much to consider and to take into account. Using a checklist helps an estimator keep track of all the details and allows them to add items as they are thought of or come up during the estimating process. There are many estimating template checklists already available on the internet, or an estimator can make one themselves. In either case, edit the checklist each time it is used to be more comprehensive and useful to your task. Mark items that aren’t relevant as NA (not applicable) or remove them completely. Add notes for items that need to be modified to better fit your project. Sometimes items can be combined, or some may need to be broken down further. Note everything on the checklist to make the job of estimating easier.

An estimator must understand the systems being used for each of the window or curtain wall types included in a set of plans, and what materials must be included in the material takeoffs. Additionally, he or she must also determine miscellaneous needs—for example, packaging and shipping materials if a project is out of town and the job is fabricated in a facility. Outside of material costs, estimators must also factor in the costs of equipment and the costs of labor: is special equipment needed? How many person-hours are needed for each task?
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It is expected that every estimator will have more experience and expertise in one area over another. These areas are easy to detail to the extreme. However, it is the areas in which expertise is lacking that need as much detail included as possible. Try to identify project risks, especially in those areas that are less familiar, and factor in their costs. This will allow an estimator to mitigate any potential pitfalls.

Because of how important accurate estimates are, an estimator should not be afraid to ask questions of either a more experienced estimator or someone with practical, hands-on experience in the specific area(s) in which the estimator has less experience. One of the more important characteristics an estimator can develop is the ability to recognize what they do not know.

Melissa Fischer is instructional designer for the National Glass Association, glass.org. She can be reached at mfischer@glass.org.

This article is based on the new Introduction to Estimating course from the National Glass Association's online learning platform, MyGlassClass.com. The course, developed in conjunction with top industry professionals, is part of a larger estimating essentials educational bundle that also addresses reading blueprints.

There are many intricacies and details that go into an estimate, with the foundation being the project blueprints. Reading and understanding blueprints and plans is essential to determining accurate estimates, neither of which are simple tasks. The new course bundle for MyGlassClass.com addresses these responsibilities. The bundle includes:

- Two eLearning courses covering the essentials:
  - Reading Plans and Blueprints
  - Introduction to Estimating
- Glass and Glazing Estimating Essentials Manual offered digitally within each eLearning course
  - For a nominal fee, the bundle can also include an exclusive, professionally printed and bound manual.
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Amazon Echo and SageGlass

Electrochromic glassmaker SageGlass announced its tintable smart glass can be made even smarter with the integration of voice control. SageGlass dynamic glass is now able to integrate with Amazon Echo to provide occupants with a more user-friendly experience while helping to streamline operational efficiencies. Occupants can control the dynamic glass’s tint via simple voice commands to optimize daylight and outdoor views while preventing heat gain and glare. This offering is expected to be integrated into larger building management systems so building owners and facilities managers can manage SageGlass along with other voice-enabled smart devices in the building.

“The use of [Internet of Things] technologies such as voice in buildings is growing in popularity as building owners place more emphasis on occupant comfort, convenience and productivity,” says Alan McLenanahan, CEO of SageGlass. “SageGlass can already be integrated with most building management systems and controlled via mobile app, so the next natural technological progression for our dynamic glass is the use of voice commands as an added convenience to building owners and occupants.”

SageGlass’s integration with Amazon Echo provides occupants with additional flexibility so they can control the dynamic tinting of the glass without the need for facilities management intervention, a wall switch or mobile app. Occupants can make statements such as “Alexa, ask SageGlass to reduce glare,” or “Alexa, ask SageGlass to let the warm sunshine in,” and watch the glass tint in accordance with the command. SageGlass provides smart building installation documentation and sample code, detailing how SageGlass can be integrated with other building management components and Amazon Web Services.

SageGlass’ integration of voice-control technology follows an overarching trend toward smart spaces. “Humans are demanding more awareness and control over things they can get over mobile device,” says Ryan Park, global head of marketing and product management. “Adoption [of smart systems] has been seen primarily in the home space. Traditionally non-connected things—thermostats, security systems—are being connected. It is challenging [the] business model of traditional products, changing the dynamic of how people are interacting with products.

“The trends in the home space naturally translate to the office,” Park continues. “Occupants, who might be spending most of their time in an office, are asking what else they can do with connectivity and convenience in those spaces.”
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Industry Products

Machinery and equipment

Automatic profile bender
Forel developed and upgraded its automatic profile bender to cater to different needs and typologies of material. According to the company, the bender can now support the profile during processing, thanks to a smart arm that works to avoid the risk of breaks or deformations when working with larger sizes. The bender offers a classical internal fold and an internal fold of 90 degrees, which is designed to be visually identical to the “corner keys” or to the welding junction. The calibration of the bending is managed by software to ensure complete control and precision of the angle.

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CNC work centers
The Master Series CNC work centers from Intermac are designed to provide maximum machining flexibility with a wide choice of work bed sizes and optional features. The 5-axis head, with endless rotation C-axis and tilting head A-axis, is designed to ensure flexibility and the execution of complex machining operations.

704/357-3131 | intermac.com

Digital printer
Tecglass introduces the F Type F K Series line, a multifunctional machine that is engineered to meet the needs of single pass and multi-pass high-speed mass production processes with multicolor printing capabilities. F K Series can print on glass sizes up to and including 177.2 by 47.2 inches in single pass and larger sizes in multi-pass, in just a few seconds. This line is ideal for mass printing of frames, logos, patterns and graphic motifs on all types of glass.

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Glass storage system
The glass storage drawer systems by Bromer have a capacity of 4,500 pounds per drawer and are designed to remain easy to pull in and out even when heavily loaded. With the ladder and security railing option, the top of the structure can also be used for storage.

450/477-6682 | bromerinc.com

Sealants

Silicone sealants
GE Silicone introduced a new line of silicone sealants. The SCS1200 Construction Sealant is an acetoxy-cure silicone for glazing applications. With permanent flexibility and excellent adhesion, it can form a strong waterproof seal and withstand weathering, according to the company. The SCS2800 SilGlaze II Sealant is ideal for projects that require immediate handling, due to its easy application and fast cure rate, in addition to its UV resistance. The SCS2000 SilPruf Sealant forms a durable seal to withstand high joint movement and extreme weather exposure for decades, the company reports.

877/943-7325 | siliconeforbuilding.com

Windows

Ventilating window system
The Techvent 5300 window systems from Exterior Technologies Inc. feature a top-hinge design that allows the unit to remain open during normal rainfall while keeping the interior dry, the company reports. The windows can be operated manually or electrically, can be integrated with building control systems and typically range from 3 to 8 feet high. The system can be factory-assembled with interlocking vertical mul-lions for installation as continuous clerestory wings up to 150 feet wide, or as smaller, individual “punched” openings. The units also can be used as operable skylights when installed on a slope. The system accepts glass or cellular polycarbonate glazing in thicknesses up to 1 inch.

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People

**National Glass Association**
The National Glass Association, glass.org, added three new board members who began their terms at its summer board meeting in June in Vienna, Virginia: Tim Kelley, TriStar Glass, tristarglass.com; Cathie Saroka, Goldray Glass, goldrayglass.com; Gus Trupiano, AGC Glass Company North America, agcglass.com. The meeting represented the fulfillment of NGA’s new governance structure consisting of 13 voting board members representing the entire supply chain. The new governance structure became effective after NGA combined with the Glass Association of North America on Feb. 1. The new members join these current board members for the remainder of the 2017-2018 term: chair, Ken Mariotti, Woodland Windows and Doors, woodlandwindows.com; chair-elect, Angelo Rivera, Faour Glass Technologies, faourglass.com; treasurer, Doug Schilling, Schilling Graphics Inc., schillinggraphics.com; immediate past chair, Michael Albert, S. Albert Glass Co., salbertglass.com; Guy Selinske, American Glass & Mirror, americanglassandmirror.com; Chris Bole, Pikes Peak Glass Inc., pikespeakglass.com; Tom Whitaker, Mr. ShowerDoor Inc., mrshowerdoor.com; Brian Hale, Hale Glass Inc., haleglass.com; Rick Locke, Windows, Doors & More Inc., windowshowroom.com; and Stanley Yee, Dow Corning Corp., consumer.dow.com.

**Graboyes Smart Buildings**
Philadelphia-based building performance firm Graboyes Smart Buildings, graboyes-smartbuildings.com, named Robert Debski as president. Ellis Guiles, owner and president of sister company Graboyes Commercial Window Company, will serve as director and building performance advisor for GSB. Debski joins GSB from Siemens Building Technologies,

**Walker Glass Co.,** walkerglass.com, promoted Danik Dancause to the position of manager, marketing operations. Dancause has been with Walker since 2002 and has held various positions within the company in a business development and marketing capacity. In 2011, he assumed the architectural representation responsibilities for eastern Canada. He will now be responsible for establishing Walker’s marketing vision as well as managing day-to-day marketing operations and essential support to the architectural and sales directors.

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where he served as senior sales and business development manager.

Security Door Controls
Security Door Controls, sdcsecurity.com, added two new manufacturer’s representatives: Southwest Architectural Sales, located in Dallas, and Monfort Electronics Marketing, based in Indianapolis. Southwest Architectural Sales is partnering with SDC to service and support door hardware customers throughout Arkansas, Oklahoma and Texas, excluding El Paso. Monfort Electronics Marketing is offering SDC product solutions to alarm/security clients in Indiana, Kentucky, Michigan, northern Ohio, western Pennsylvania and West Virginia.

HMI Cardinal
HMI Cardinal, hmicardinal.com, named Chris FitzGerald CEO. FitzGerald brings to Cardinal over 25 years of relevant general management experience. He started his career with large multinational firms like Goodyear, United Technologies and Pitney Bowes, serving in senior general management roles leading various domestic and international businesses. Since 2010, FitzGerald has served as CEO for three successive B2B manufacturing firms, eventually leading two of these organizations through successful ownership changes.

Brio USA
Steven Klein joined Brio USA, briousa.com, as a business development manager. Klein will be responsible for product sales and customer development for the western region of North America for Brio USA. Klein brings to Brio USA over 30 years’ experience in the fenestration and building materials industry. He will work out of his home office in Tacoma, Washington.

Faour Glass Technologies
Faour Glass Technologies, faourglass.com, added Darren DeNett as its architectural representative for North Carolina and South Carolina, as well as coastal Georgia. DeNett brings a diverse background with more than 30 years’ experience in sales and as a business owner. DeNett is also founder and president of Dencon Architectural Inc., the southeastern manufacturer’s representative for Hope’s Steel Windows, an American manufacturer of luxury steel and bronze windows and doors.

HMI Cardinal
HMI Cardinal, hmicardinal.com, named Chris FitzGerald CEO. FitzGerald brings to Cardinal over 25 years of relevant general management experience. He started his career with large multinational firms like Goodyear, United Technologies and Pitney Bowes, serving in senior general management roles leading various domestic and international businesses. Since 2010, FitzGerald has served as CEO for three successive B2B manufacturing firms, eventually leading two of these organizations through successful ownership changes.

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Exterior Technologies Inc.
Exterior Technologies Inc., extechinc.com, hired Tim Metcalfe as a technical sales engineer. Reporting to ExTech’s general manager Jim Leslie, Metcalfe is responsible for assisting the sales team with technical support, primarily focusing on daylight analysis. Drawing from 15 years in the daylighting and architectural building products industry, Metcalfe’s expertise includes a special focus on daylight modeling and sustainable building strategies.

Tubelite
Tubelite Inc., tubeliteinc.com, named Kevin O’Neill as a client development manager serving clients in Connecticut, Massachusetts and Rhode Island. Based in New Jersey, he reports directly to Jim Oberlin, regional sales manager, Tubelite. They work closely with glazing contractors and architectural teams across the region to assist with storefronts, curtain walls, entrances and daylight control systems.

American Architectural Manufacturers Association
The American Architectural Manufacturers Association, aamanet.org, announced that Rich Walker stepped aside after serving for 18 years as its president and CEO. Janice Yglesias, executive vice president of the organization, succeeds him, assuming control over all daily operations. Walker joined AAMA in 1996 as technical director and advanced to Southeast region director before accepting the president and CEO position in 2000. Beyond expanding AAMA’s technical offering, Walker led the implementation of strategic objectives expanding the scope of services. Yglesias succeeds Walker after having started her career at AAMA in February 1999. In June 2000, she was promoted to marketing manager and has since held management positions overseeing membership, education, office and association operations, and human resources. Most recently, Yglesias served as association services director.

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Thad Ziegler Glass Invests in the Community

As the owner of one of the oldest family owned glass companies in the United States, Thad Ziegler knows about having deep roots in the community. Established in 1893, Thad Ziegler Glass, zieglershowdoers.com, a full-service glass company, has served the San Antonio area for 125 years, and Ziegler attributes part of the company’s current success to remaining active in the local community.

“I am positive that community involvement is very beneficial to our company,” says Ziegler. “First of all, involvement is very enjoyable and satisfying. And during our involvement we make many friends. Sometimes those friends might be a general contractor, home builder, auto dealer or simply a retail customer that needs a new tabletop, shower door or auto glass replacement. Sometimes during this involvement, we are in the newspaper or on TV, which is a form of free advertising.”

This Here’s an Idea... presents several notable examples of Ziegler’s community activities.

**Top right:** Ziegler, left, in 2006 with General Bill Looney, the commanding general of the Air Education and Training Command headquartered at Randolph Air Force Base in Universal City, Texas. As part of his position as the San Antonio Chamber of Commerce Liaison with the AETC, Ziegler accompanied General Looney on one of his Civic Leader Tours, a program that educates civic leaders in AETC’s operations and role in national security.

**Left:** Thad Ziegler, right, is crowned King Antonio by his father, Thad Max Ziegler, in 1992. King Antonio is an honorary position of the Texas Cavaliers. The organization crowns a new king annually, who acts as the organization’s representative during San Antonio’s Fiesta, a citywide celebration that honors the soldiers who fought at the Alamo and the Battle of San Jacinto, and raises funds for the city.

**Bottom right:** Ziegler with his wife, Lynn, and three of their six grandchildren in a horse-drawn carriage during the 2016 Battle of Flowers Parade, which also takes place during San Antonio’s Fiesta celebration. Lynn Ziegler was president of the Battle of Flowers Association in 2015 and 2016. The Battle of Flowers Parade is the Fiesta’s oldest event, and the only parade in the U.S. produced only by women, all volunteers.
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