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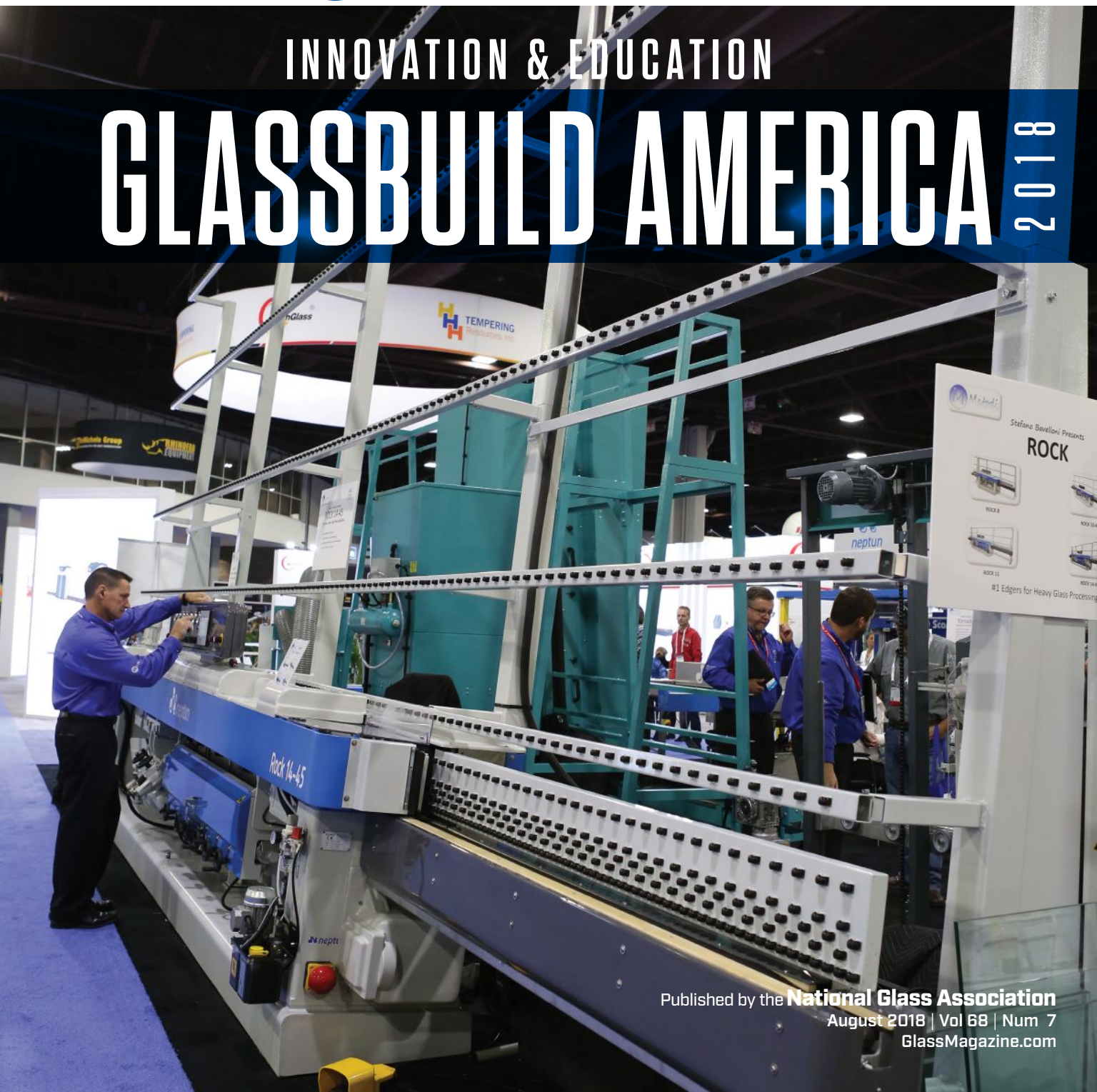
Introduction to
Estimating

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GLASSBUILD AMERICA 2018



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FEATURES

40 GlassBuild America Preview

40 Product Preview

A preview of products and services
to be featured at GlassBuild America
2018

84 Schedule-at-a-Glance

90 Exhibitor List

Companies to see in Las Vegas

104 Evolution of Green

High-performance, environmentally
sustainable construction market shifts
its focus

By Katy Devlin

112 Glaziers' Toolbox: Introduction to Estimating

Seven steps to an accurate project bid,
for new estimators

By Melissa Fischer

commercial

28 Viewpoint

Impact of Edge of Glass versus Center of
Glass on Window U-factor

By Helen Sanders

retail

32 Your Profits: Finance

Payroll Financing Solutions

By Marco Terry

fabrication

36 Factory Floor

Insulating Glass Strength Made Simple

By Joe Minor

DEPARTMENTS

6 News to Know

12 Closer Look

Aluminum Tariffs Raise Concerns in a
Booming Construction Industry

By Norah Dick

16 Trends & Analysis

Retail, Office Segments Lead 2017
Glazing Installations in Strong Market

20 Codes & Standards

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

By Tom Culp

24 Legal

Beware of False Advertising in
Marketing Puffery

By Matt Johnson

118 Industry Products

122 People

129 Classifieds

131 Suppliers Guide

144 Reader Response Center

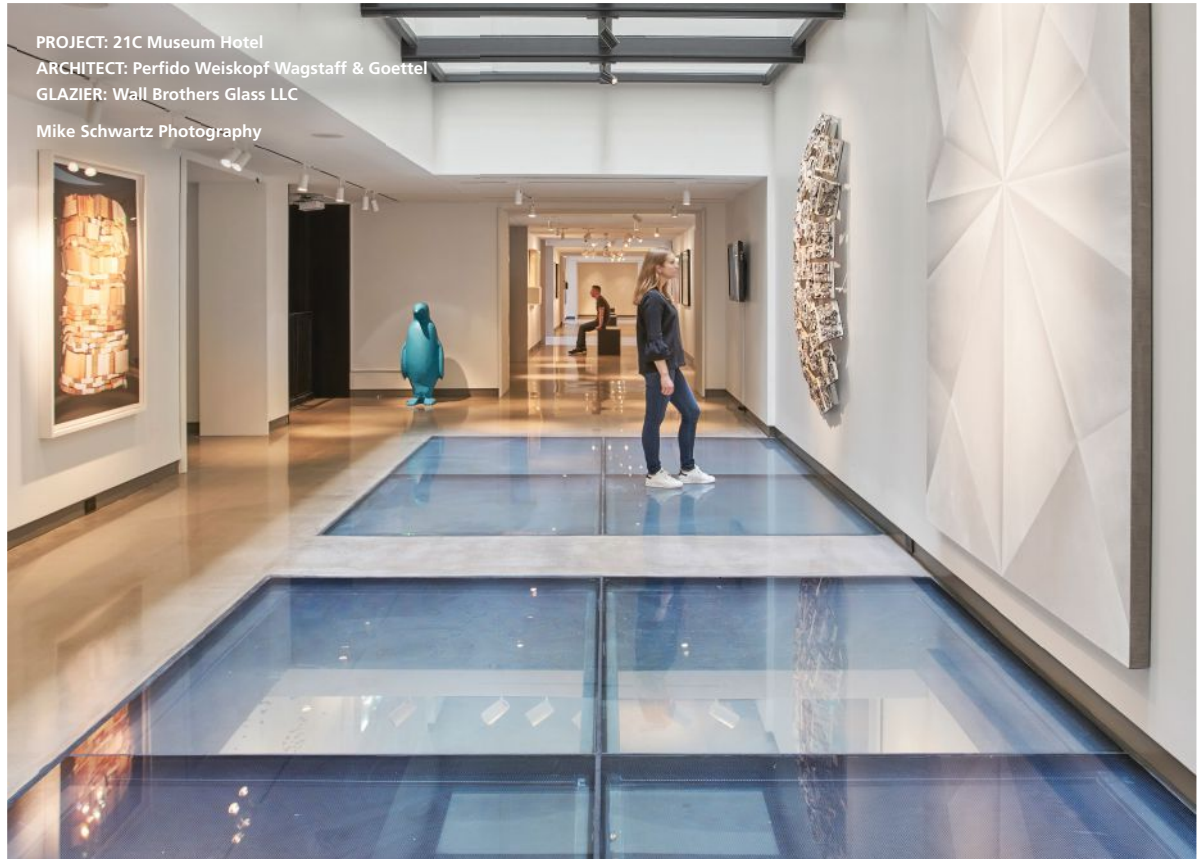
146 Here's an Idea...

Thad Ziegler Glass Invests in the
Community

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, robbphotos.com.




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News to Know

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CRH to Establish New Global Building Products Division

CRH plc, crhamerica.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, presi-

dent, 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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share—16.1 percent of Sika’s capital and 52.4 percent of its voting rights—in a confidential auction process from the Burkard-Schenker family, which owns the majority stake in Sika. (To read Glass Magazine’s coverage at the time, visit GlassMagazine.com/August2018.) The transaction led to a three-year legal battle, with Sika management challenging the sale of majority ownership shares from the Burkard-Schenker family. In May, officials from Saint-Gobain, Sika and the Burkard-Schenkers signed an agreement to end the legal standoff.

The terms of the agreement allow for the ownership family to sell their stake in Sika to Saint-Gobain, “which will give up the special voting rights that were at the heart of the conflict,” according to a May 11 report from Bloomberg. Sika also purchased a 7 percent holding from Saint-Gobain, according to the article.

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, fuyausa.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. 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

AmesburyTruth, amesburytruth.com, resolved a patent infringement lawsuit with Vision Industries Group Inc., visionhardware.com. Vision has agreed to stop selling the inverted block and tackle balance systems at issue in the lawsuit from June 2019 until January 2022.

AmesburyTruth filed the lawsuit, Amesbury Group, Inc. v. Vision Industries Group, Inc., Case 2:17-cv-07303 (D.N.J.) on Sept. 20, 2017, alleging that Vision’s inverted balance systems infringe AmesburyTruth’s U.S. patent Nos. 8,424,248 and 9,580,950 related to inverted balance systems. Vision denied all of the allegations of the lawsuit. 

**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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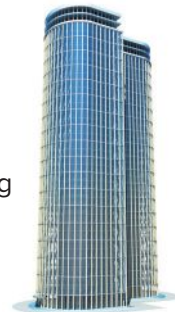


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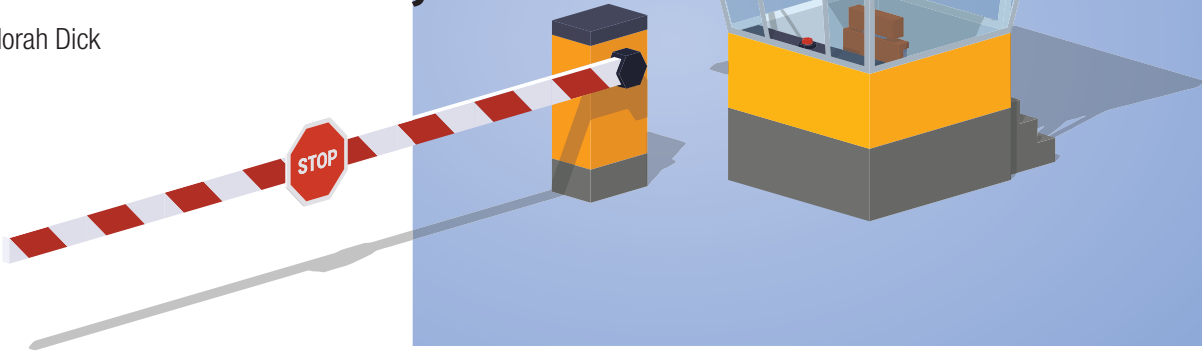
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Aluminum Tariffs Raise Concerns in a Booming Construction Industry

By Norah Dick



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

Tariff Quick Facts

- ▶ Imposed on March 8
- ▶ 10 percent aluminum tariff
- ▶ 25 percent steel tariff

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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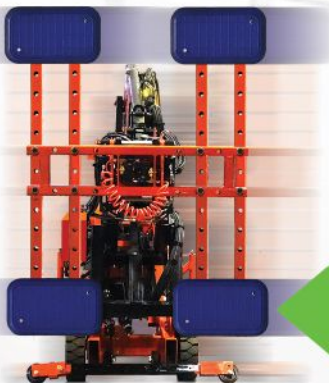
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Closer Look

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 "stress[ed] 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.

ming from the recent tariffs; however, any time there is an increase in the cost to build it does raise anxiety in the market," says Stepe. "We also feel that the tariffs will have an impact on numerous other industries, and this is a concern in terms of the impact the tariffs will have on the greater overall

economy." Stepe says he has not seen problems with aluminum supply so far.

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 distribu-

tors 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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Retail, Office Segments Lead 2017 Glazing Installations in Strong Market

Storefront takes largest market share according to product type

Source: AAMA 2017/2018 U.S. Industry Market Studies from the American Architectural Manufacturers Association, aamanet.org

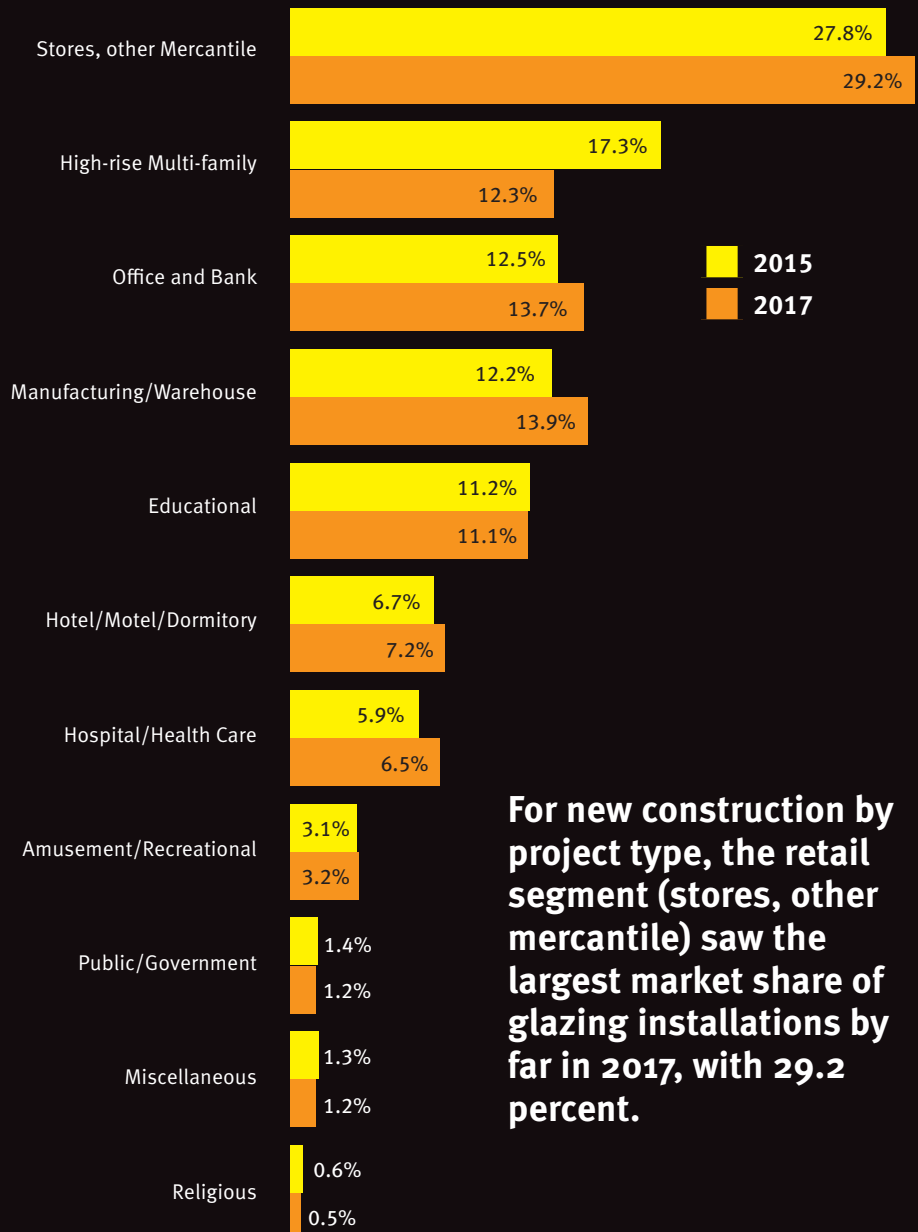
In 2017, new construction and major additions constituted 66.5 percent of all nonresidential vision installations in the United States, with renovations making up the remaining 33.7 percent, according to the AAMA 2017/2018 U.S. Industry Market Studies from the American Architectural Manufacturers Association, 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 29.17 percent. The next largest segment was manufacturing/warehouse, with 13.9 percent market share, followed very closely by office and bank, with 13.7 percent market share. In 2015, high rise multifamily had been second. In 2017, it dropped to fourth.

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,

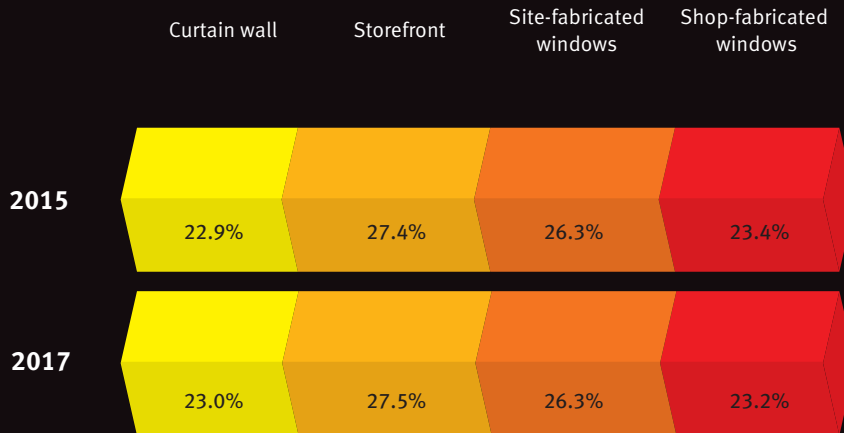
Fig. 1 New Nonresidential Construction and Major Additions
Segmented by building category (millions of square feet—vision area)



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.


Fig. 2 Total Nonresidential Vision Area

Segmented by type of construction (millions of square feet—vision area)



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

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. 

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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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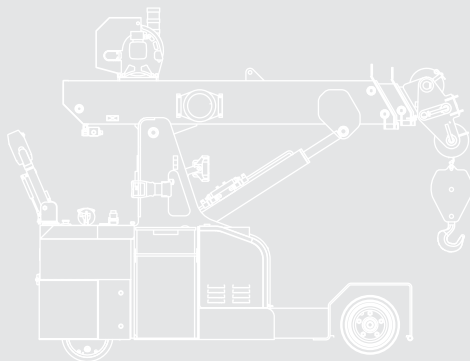
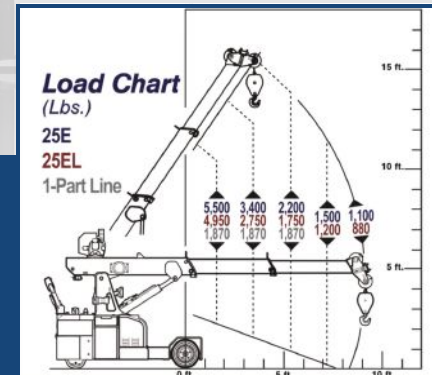
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This issue has been debated at ASHRAE for 14 years. It was agreed to resolve this issue in part because of the realization that the real-world market impact is small, as architects choose different window products appropriate for their particular application, 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. **B**



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Tom Culp is a technical code consultant for the National Glass Association, glass.org, and the Aluminum Extruders Council, aec.org, and is the owner of Birch Point

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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 con-

duct 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 guide-

lines 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. 



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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.

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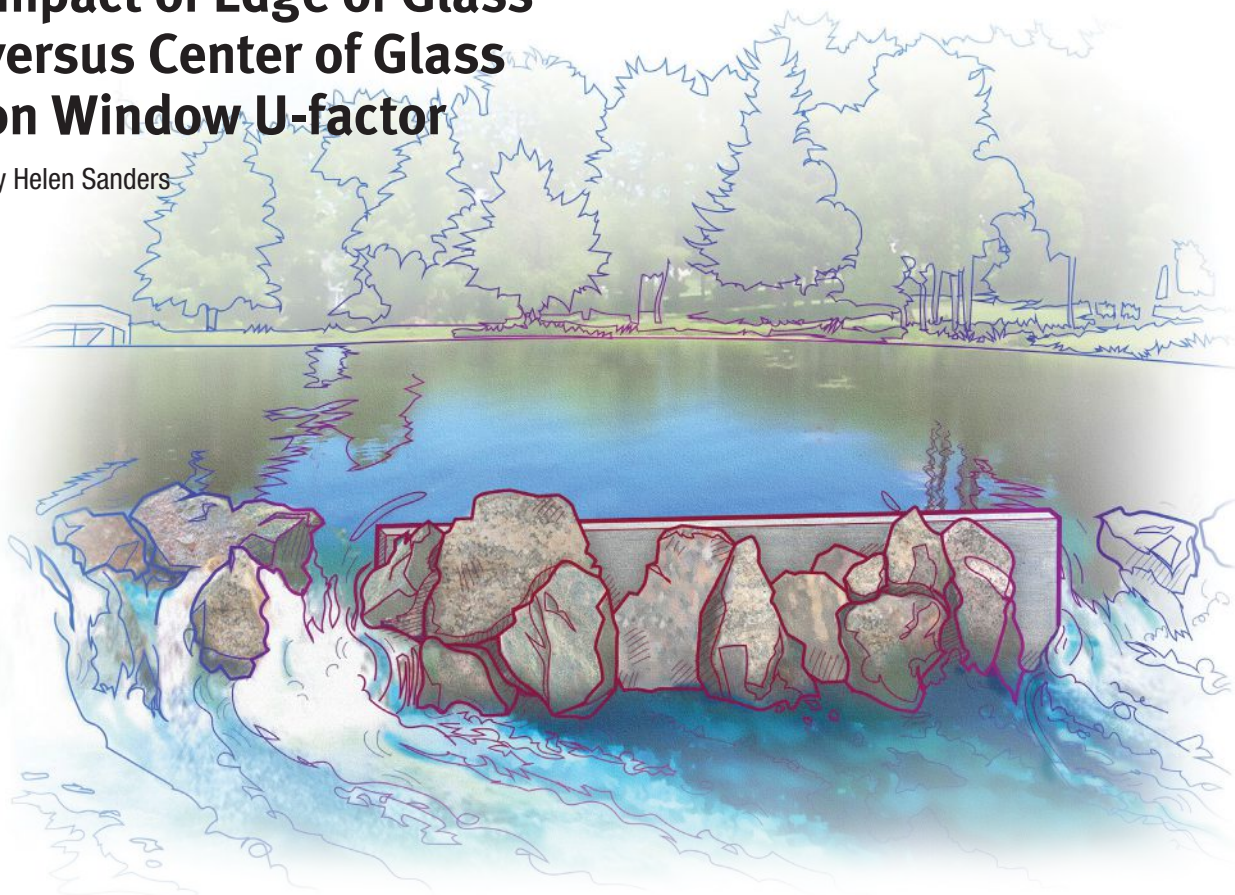


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Impact of Edge of Glass versus Center of Glass on Window U-factor

By Helen Sanders



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. Illustration courtesy of Technoform, technoform.us.

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. 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 $\text{btu}/^\circ\text{F}\cdot\text{hr}\cdot\text{ft}^2$ —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

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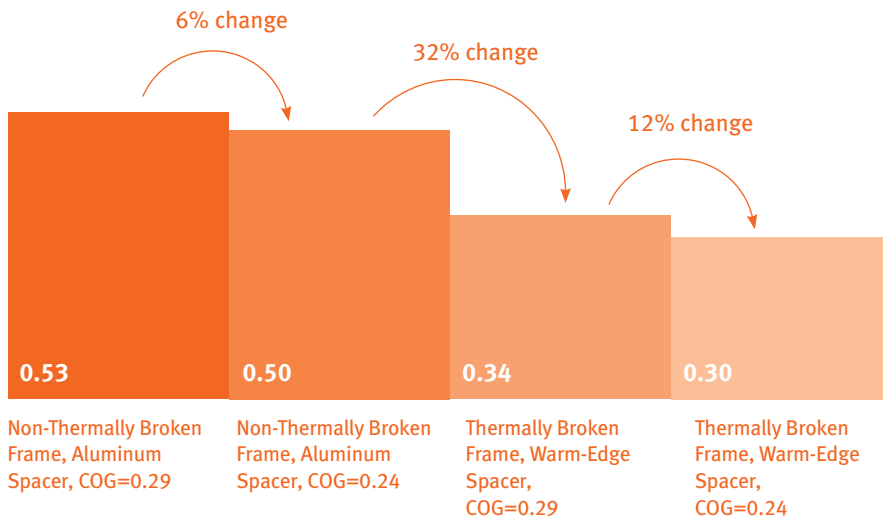
"The Inkjet Printer allows us to date-stamp the spacer on-line, which saves labor, but also minimizes obstructions to the sight line. The Argon Filling Chambers have not only increased efficiency, they've lowered our material costs. The Quartz Heating Lamps allow for immediate sealing of the units, which 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.



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Window U-factor with Improvements in Edge of Glass Compared to Center of Glass




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.

should be on improving the performance of the frame (biggest influence) and EOG, before specifying the COG package.

Having a high-performance edge is an enabler for achieving a high-performance window system, and it can provide greater flexibility in glass choice because the highest COG U-factor may not be needed. A top-performing frame can achieve the same performance with dual-pane glazing than a poorer performing frame with triple-pane glazing. For example, a non-thermally broken window wall must use a triple-pane, krypton-filled IG unit with two low-E coatings (COG U-factor = 0.14 btu/°F.hr.ft²) to reach a fenestration U-factor of 0.33 btu/°F.hr.ft², whereas a simply thermally broken system need only use a dual-pane IG unit with one low-E coating (COG = 0.24 btu/°F.hr.ft²), according to data for window walls based on the National Fenestration Rating Council, nffc.org, database.

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. 

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Payroll Financing Solutions

Recommended solutions and options to avoid

By Marco Terry



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
5. Balance sheet.

Once an owner knows where the business stands financially, he or she can better understand where it

The only effective solution is to prevent missing payroll from ever happening.

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.



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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.

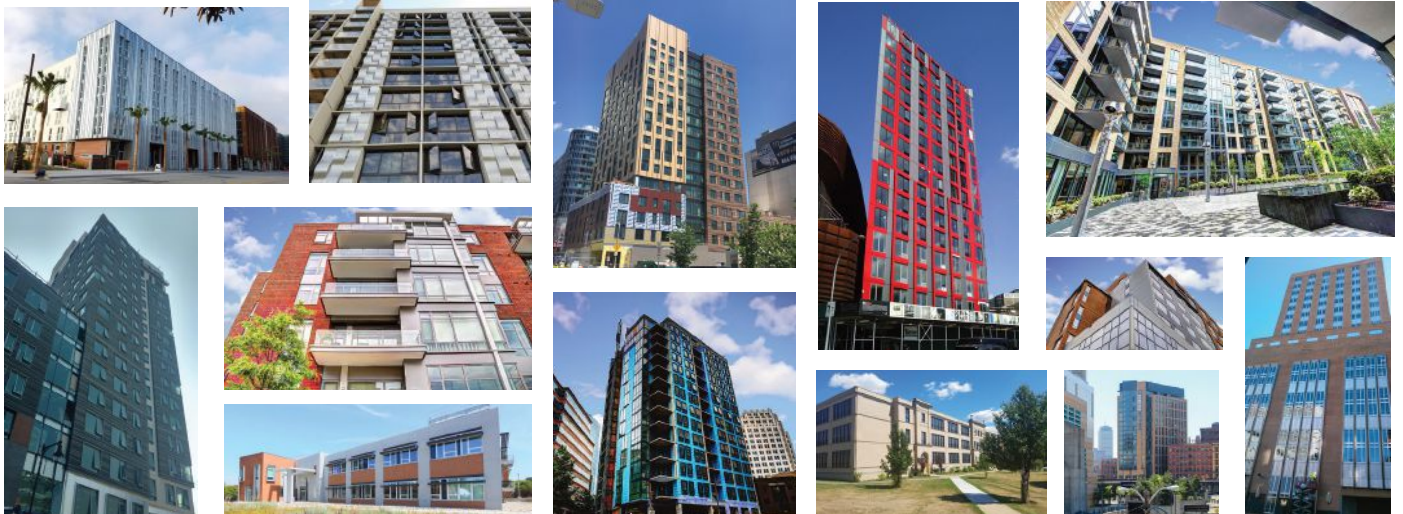


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Insulating Glass Strength Made Simple

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 strength 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

Table 1. Insulating Glass Strength

Glass Area (square feet)	Thickness (inches)	Strength of Single Lite (pounds per square foot)		
		Heat Treatment		
		AN ¹	HS ²	FT ³
50	1/4	17	35	69
	5/16	26	53	105
	3/8	36	73	145
60*	1/4	15	30	59
	5/16	22	45	88
	3/8	30	60	119
70	1/4	13	26	53
	5/16	19	39	78
	3/8	26	51	103

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.

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

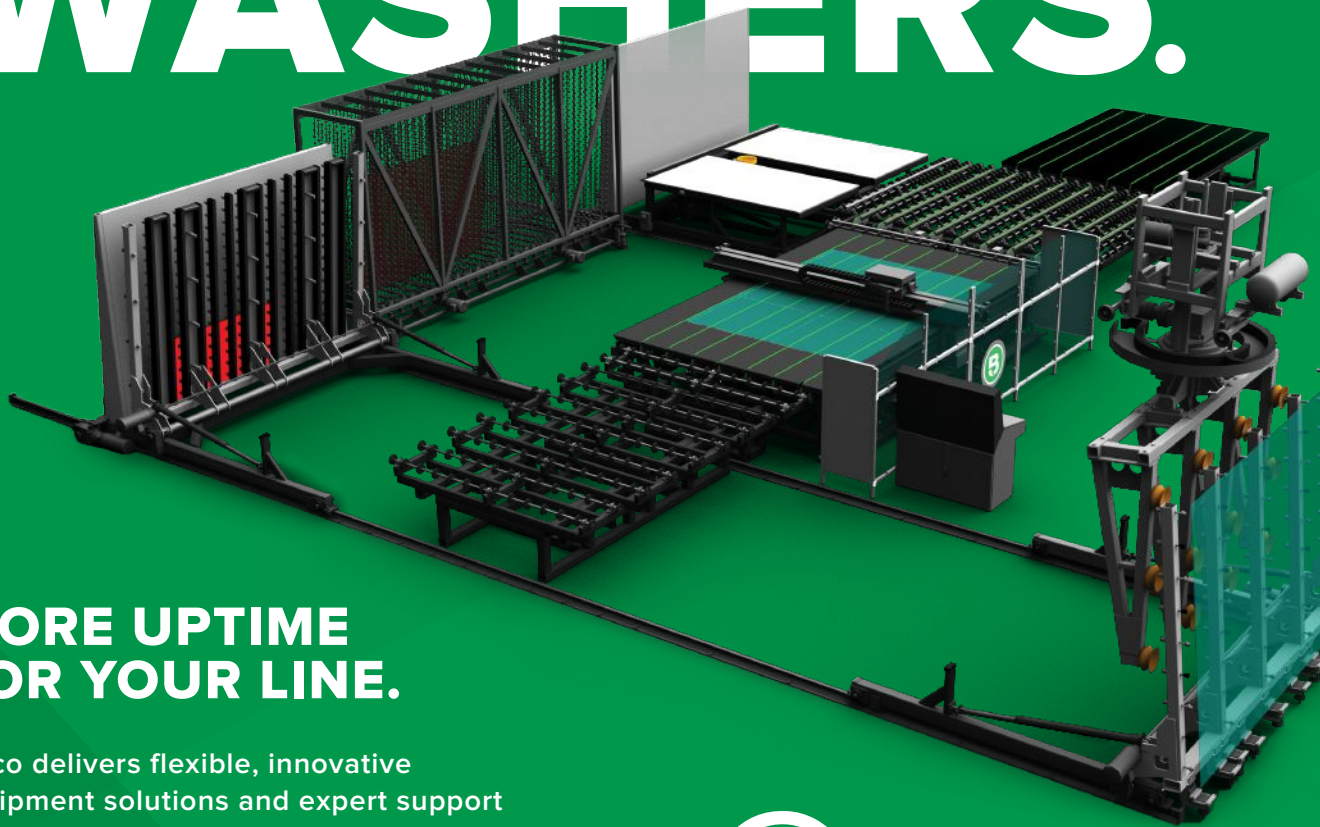
that are based on the strength of a single fully tempered or heat-strengthened lite, with only three exceptions.

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.

The process

Using Table 1, an acceptable IGU construction may be realized if it is composed of a combination of two lites from

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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,

Thickness (inches)	Heat Treatment	Area (square feet)	Inland Zone Height Limit (feet)	Hurricane Zone Height Limit (feet)
1/4	HS ¹	≤70	70	N/A
1/4	HS	≤60	100	N/A
1/4	HS	≤50	150	N/A
1/4	FT ²	≤70	800	130
1/4	FT	≤60	1100	160
1/4	FT	≤50	no limit	250
5/16	HS	≤70	300	N/A
5/16*	HS	≤60	450	60
5/16	HS	≤50	700	110
5/16	FT	≤70	no limit	500
5/16	FT	≤60	no limit	700
5/16	FT	≤50	no limit	no limit
3/8	HS	≤70	650	120
3/8	HS	≤60	no limit	180
3/8	HS	≤50	no limit	340
3/8	FT	≤70	no limit	no limit
3/8	FT	≤60	no limit	no limit
3/8	FT	≤50	no limit	no limit


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.

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 (see shaded entries). 



Dr. Joseph E. Minor, PE, is a consulting engineer and professor emeritus in the Department of Civil, Environmental, and Construction Engineering at

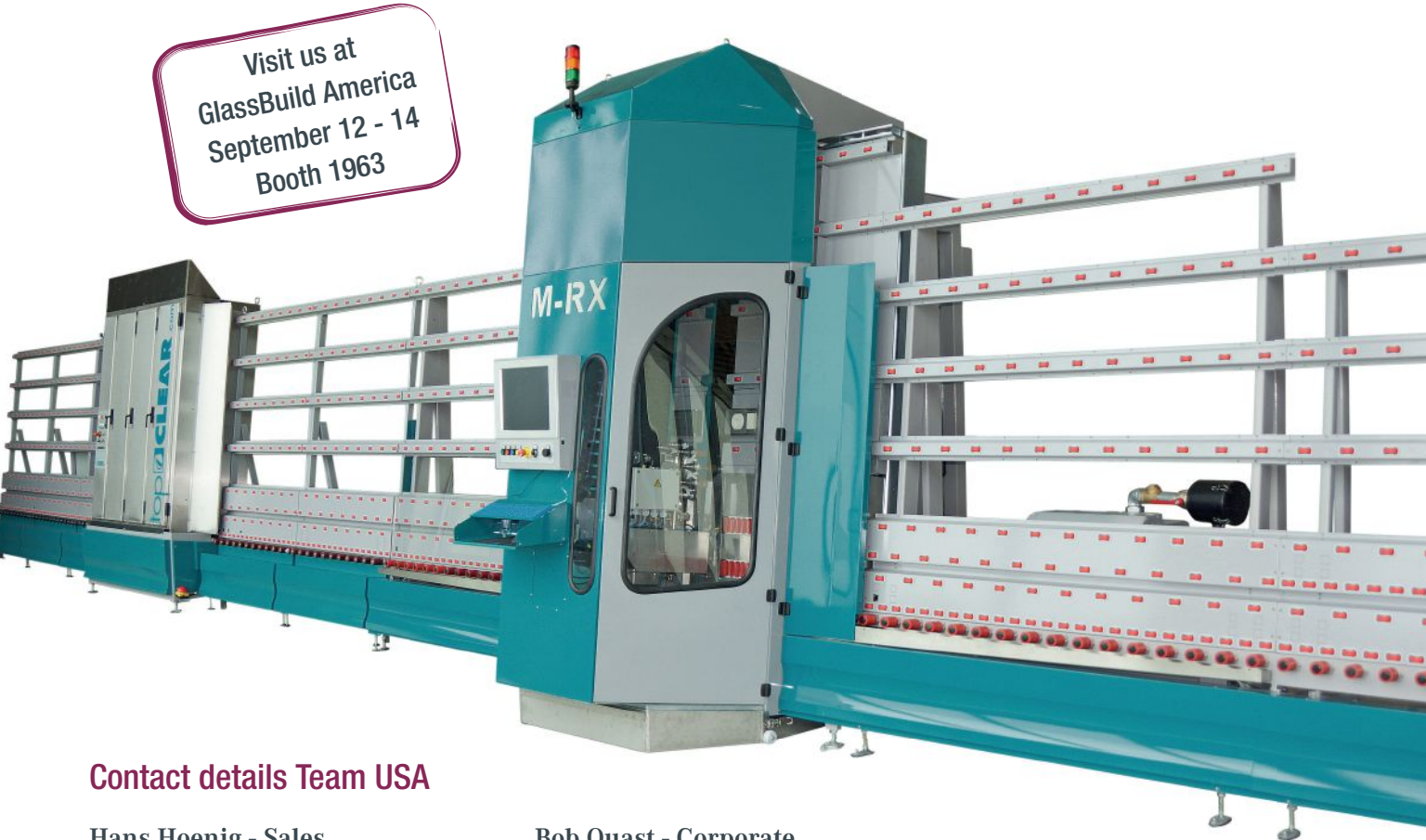
Texas Tech University. He can be reached at josephminor@sbcglobal.net.

LiSEC USA to take over Sales and Service of Schraml machines in North America

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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Contact details Team USA

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Vice President and Director of Sales
E-mail: hansh@liscamerica.com

Bob Quast - Corporate
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GLASSBUILD AMERICA PRODUCT PREVIEW

A PREVIEW OF PRODUCTS AND SERVICES TO BE FEATURED
AT GLASSBUILD AMERICA 2018

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.

ONLINE

Visit GlassMagazine.com/August2018 for additional GlassBuild America 2018 product coverage and event news. During the show, follow @GlassMag on Twitter and @glassmagazinenga on Instagram for live coverage.

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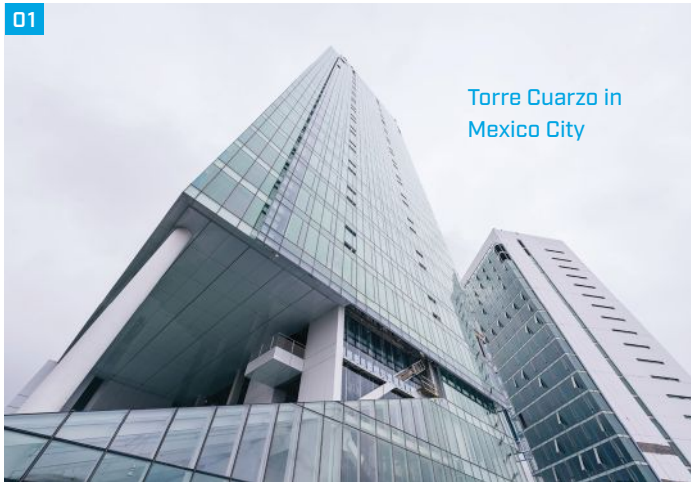
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01



Torre Cuarzo in Mexico City

02



03



04



ARCHITECTURAL GLASS

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

CURTAIN WALL

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 CRFf of 79. Booth #713
 800/866-2227 | TUBELITEINC.COM

DECORATIVE GLASS

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**

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New **Express 330T**

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

New **Express 440 CW**

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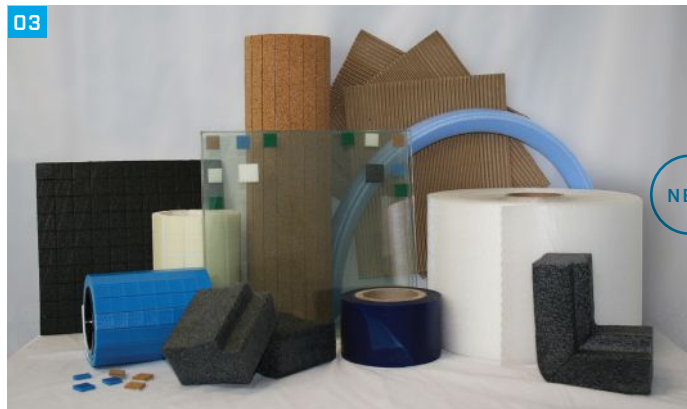
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NEW



02

NEW



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NEW

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] 9382-8033-3 | SEVASA.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

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

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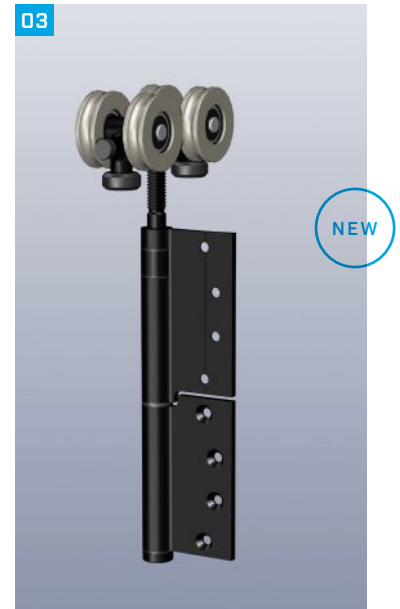
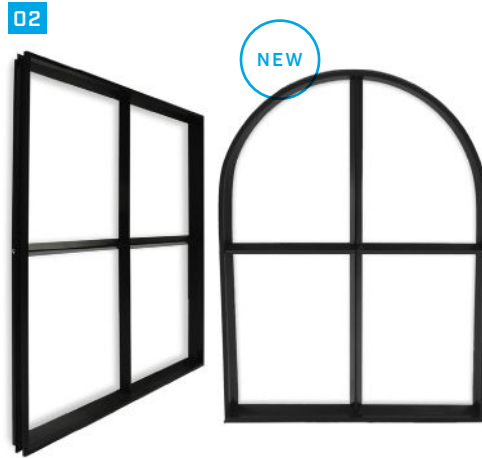
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Top-hung Magnum bi-fold intermediate carrier set top hinge, shown in black

HARDWARE

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 3/8-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

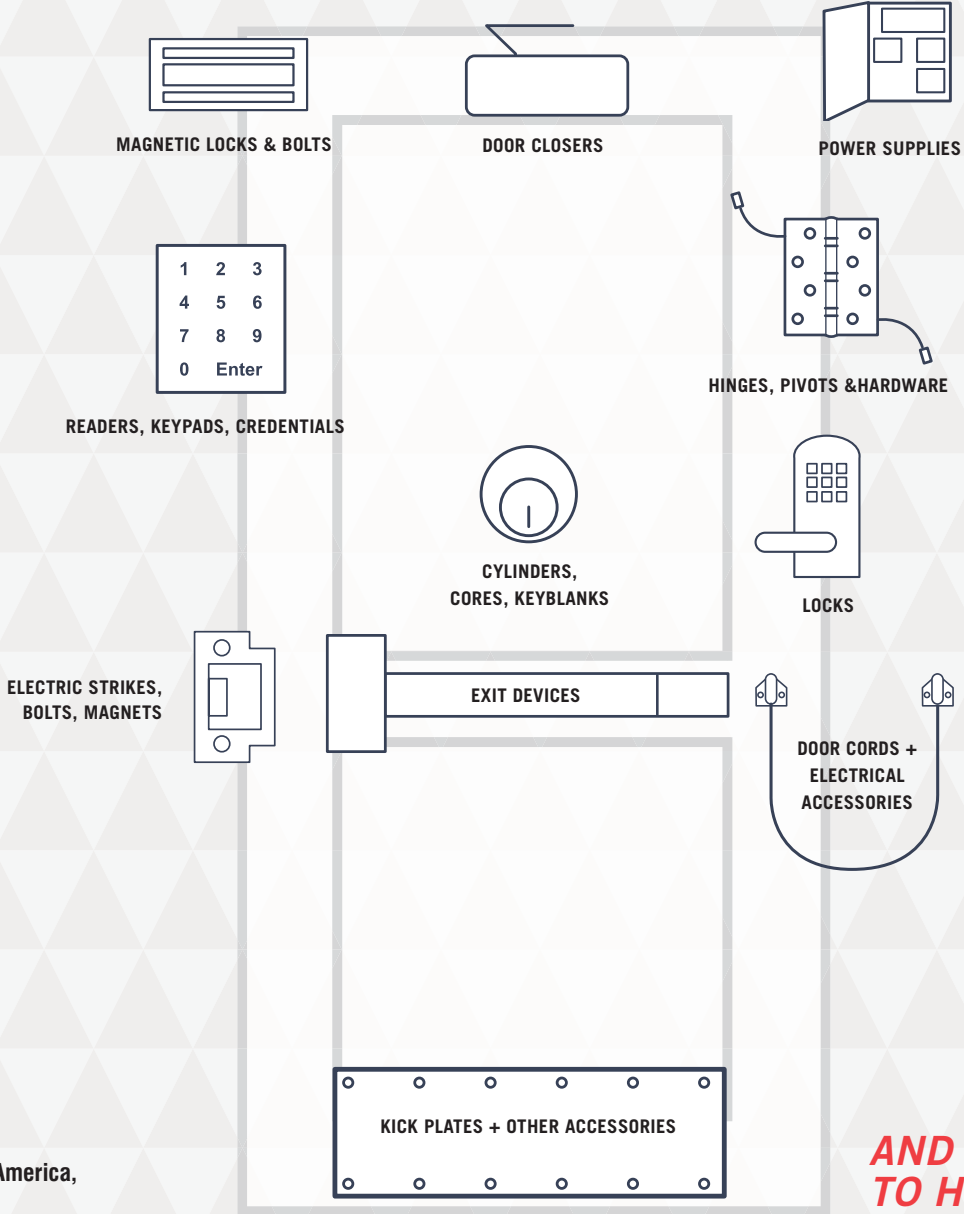
03/ Caldwell Manufacturing Co.

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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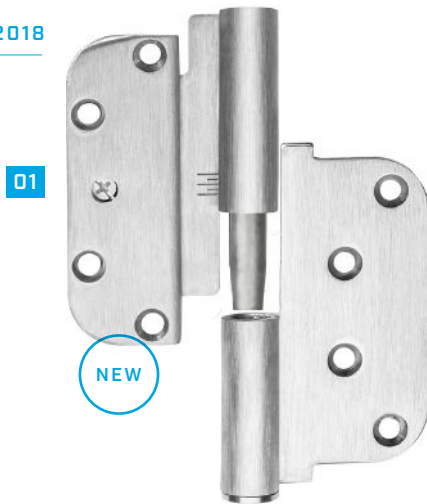
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HARDWARE

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

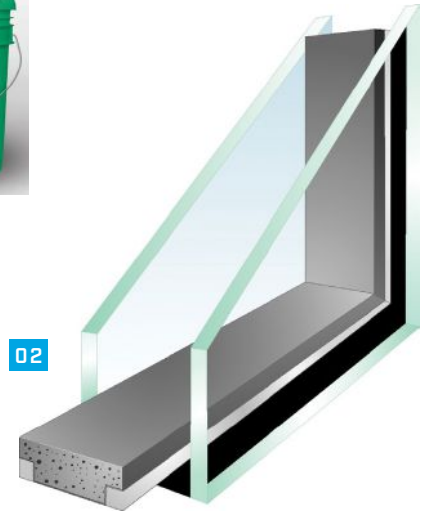
Fenzi North America will debut its new Sealver AR, a two-part silicone insulating glass sealant, the latest product introduced by the company for insulating glass applications. Made in North America, Sealver AR offers insulating glass manufacturers superior durability, low moisture vapor transmission 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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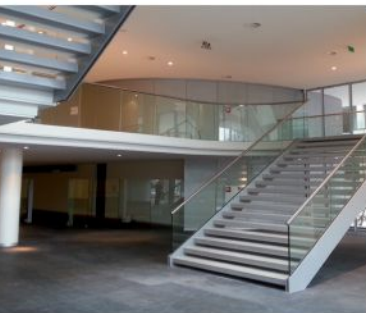
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INTERLAYERS AND FILMS

Chung How Paint Factory

(not pictured)

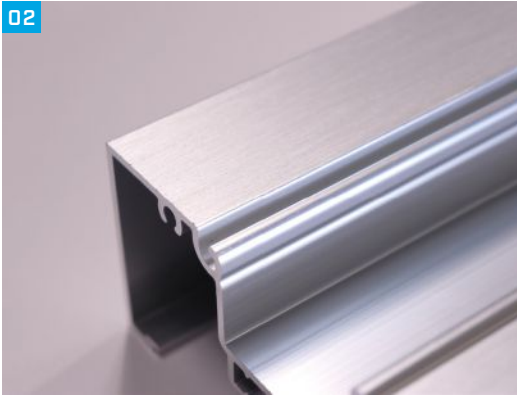
Chung How Paint Factory will showcase its CUR Solar Control PVB Film. The product has an infrared radiation absorber inside. The film shields up to 50 percent of solar heat and passes 70 percent of visible light, providing the same views as regular laminated glass, with added heat-shielding ability, 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

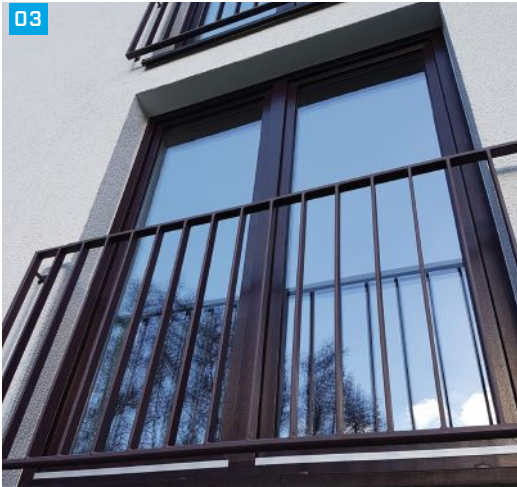
Nanovations USA will debut NG-1010 hydrophobic glass treatment, an invisible, ultra-thin coating, formulated with inorganic colloidal silica to offer water-repellent and easy-to-clean glass surfaces. The coating is free of silicone, wax, Teflon and siloxane, and is UV-resistant and resistant to abrasion. In a

See us at GlassBuild America, booth 1255.

02



03



two-step coating process, Nanovations' CL-50 surface prep uses colloidal, submicron abrasives to clean the glass, and prepares the glass to bond to the NG-1010 glass coating. Booth #1677
561/630-0747 | NANOVATIONSUSA.NET

PAINTS AND FINISHES

02/ Linetec

Linetec's brushed stainless anodize aluminum finish creates a similar look to the clean, bright surface that architects and specifiers find desirable in stainless steel, reportedly offering a more cost-effective, lightweight option. Brushed stainless anodize finish resists fingerprints and scratching and requires minimal maintenance even in high-traffic areas. Linetec's anodize finishes resist the ravages of time, temperature, corrosion, humidity and warping, for a long lifecycle, and meet the requirements of AAMA 611. Booth #712
888/717-1472 | LINETEC.COM

03/ Renolit

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

04



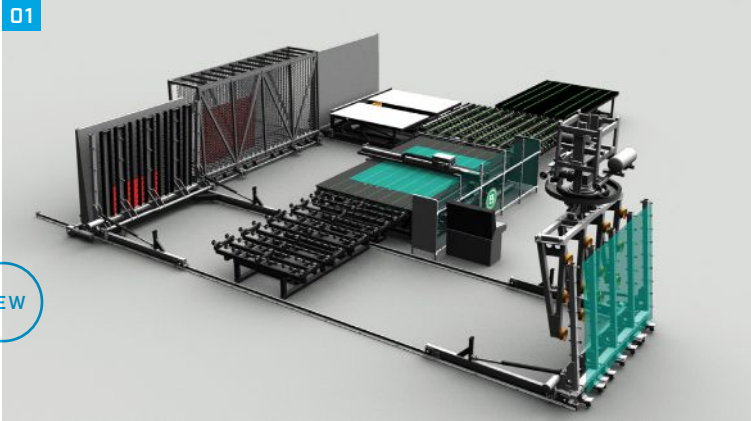
quick lead times and low minimum order quantities, it reports. Free samples are available upon request. Booth #1373
972/722-7351 | SURFACEARMOR.COM

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

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NEW

02

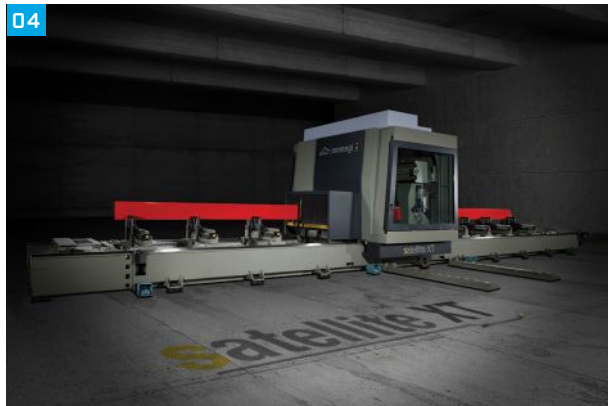


BRS on display at Vitrum 2017

03



04



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 Elettromeccanica

Bovone Elettromeccanica will show the BRS Bovone Robotic System. The BRS

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

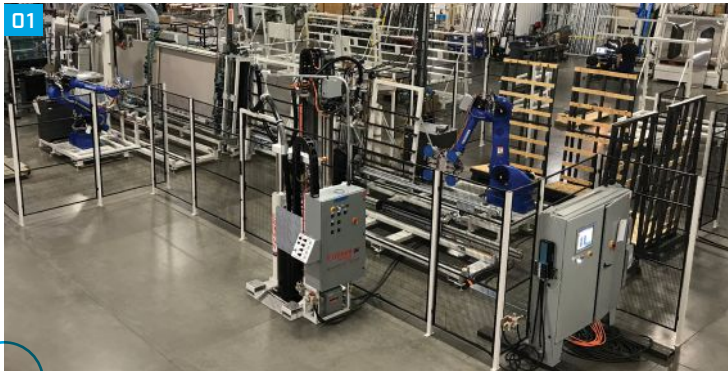
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01

NEW



02

NEW



03



04

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 mono-block 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 arassing 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

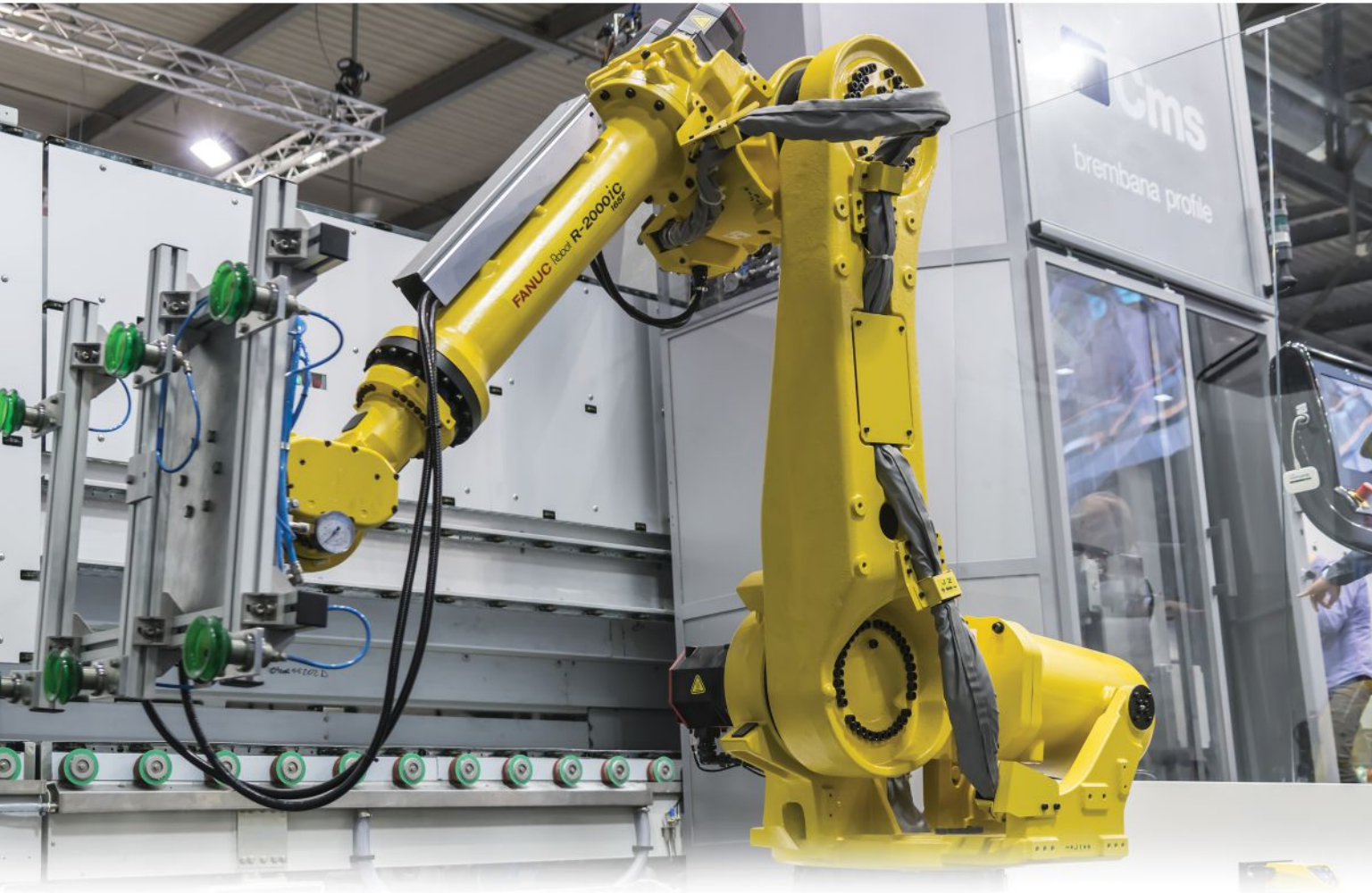
performance. With the WorldSpacer production line, IGU fabricators can reduce flexible spacer cost and address spacer inventory issues, according to company officials. The line features a zigzag conveyor addition that eliminates 60 feet of length. Booth #1763 954/975-3233 | GLASSLAM.COM

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 +[358] 1050-0500 | GLASTON.NET



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01



02



MACHINERY AND EQUIPMENT

01/ HHH Tempering

HHH Tempering Resources will show the Butyl Extruder Machine LJTBD01. The equipment offers increased speed and precision when applying butyl coatings to insulating glass units, according to HHH officials. The Butyl Extruder LJTBD01 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 Demme'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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01



MACHINERY AND EQUIPMENT

01/ J&S Machine Inc.

J&S Machine Inc. will be displaying the CR138RIMW 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

02



machine uses a database to record springback of the profiles bent, in order to reduce waste when creating new programs. The CR138RIMW 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 solu-

tions 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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The processing of the glass edge is performed by five families of machines

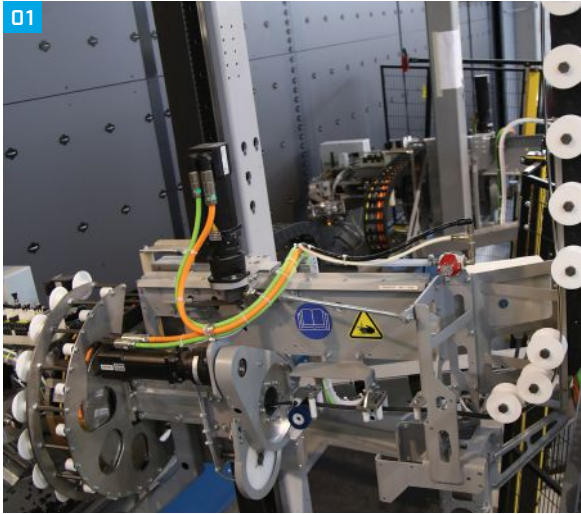
- Straight line edgers - *flat & arris, mitering and bevel*
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- Pencil edge double edger - *standard and high performance*
- CNC Centres - *3 and 4 axis*
- CNC Drilling - *drilling and milling*

The Bottero range of **double edgers for flat edge** processing has been designed to meet all requirements of performance and quality in standard and special processing.

The double sided flat edging machine can be configured with 10, to 16 per side grinding wheels and particularly suited to process large sizes and thickness (up to 18 m max glass size, up to 60 mm thickness).

The double edger platform can be integrated with totally automatic lines for flexible productions, in small or large batches, with automatic dimension changes managed by the dedicated software.

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.



03



MACHINERY AND EQUIPMENT

01 / Lisec

Lisec will promote its Velocity Plus high-speed insulating glass production line. The line touts a cycle time of 16 seconds for a double IGU (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 8 Complete with Anisotropy & Distortion, an online inspection and visualization system of anisotropy, distortion and flatness of each glass sheet. The Osprey 8 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 | LITSENTRY.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 electrospindles 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 9687-3284 | MAPPI.IT

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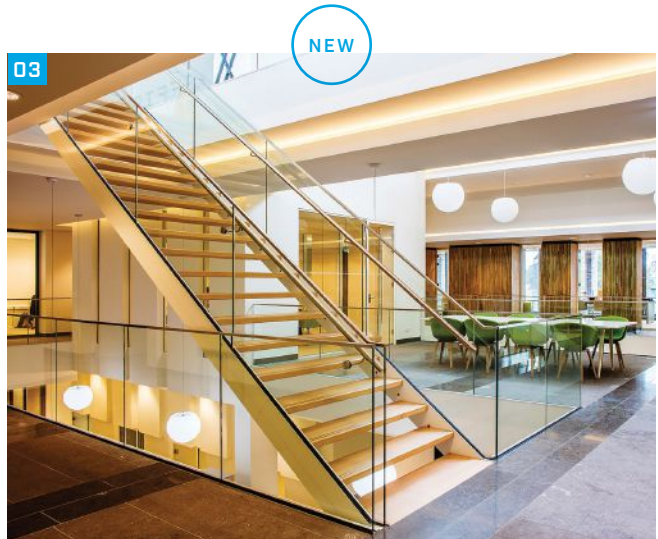
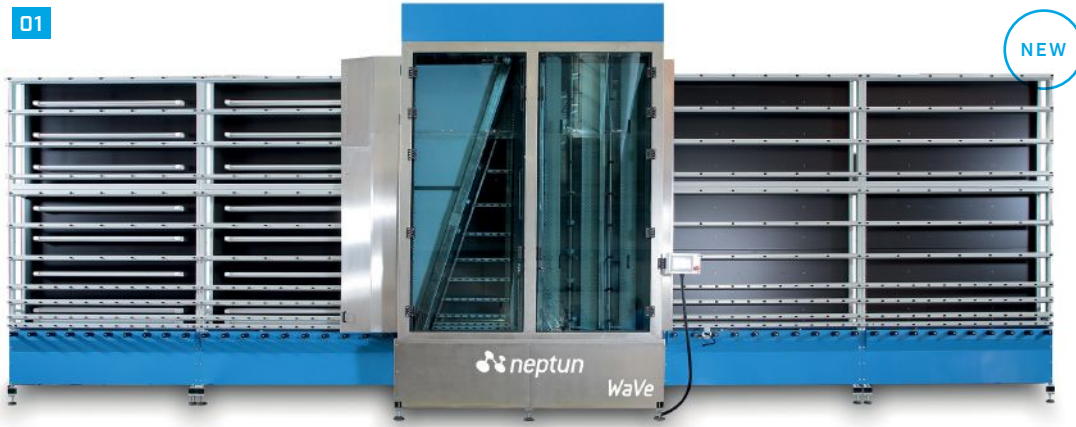
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MACHINERY AND EQUIPMENT

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)

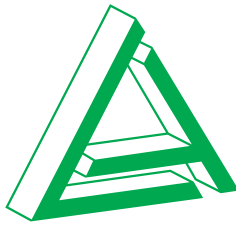
The Eco Scanner from Viprotron is an aftermarket quality scanner with an innovative and economical lighting system to allow users to identify basic defects in glass at a reduced price point. The system can be used to inspect glass for insulating or laminated glass production and can be set to inspect

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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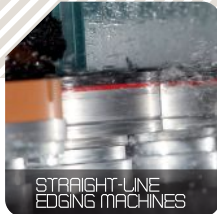
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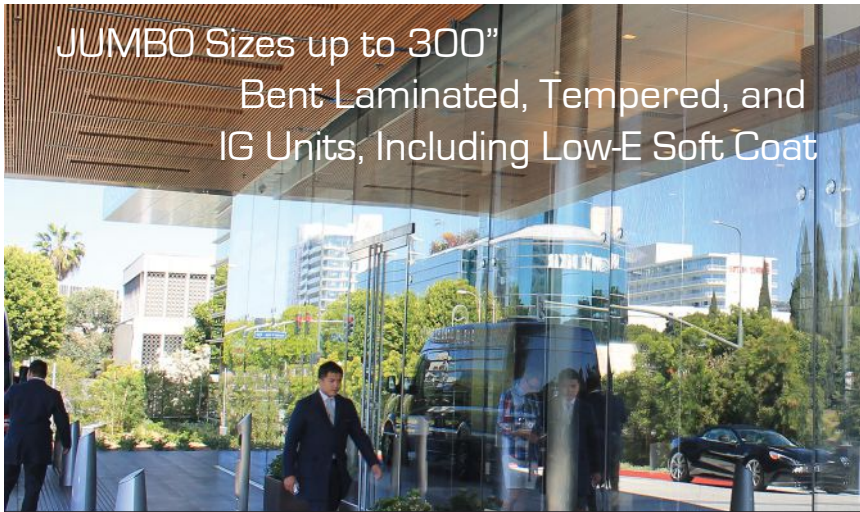
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04



NEW

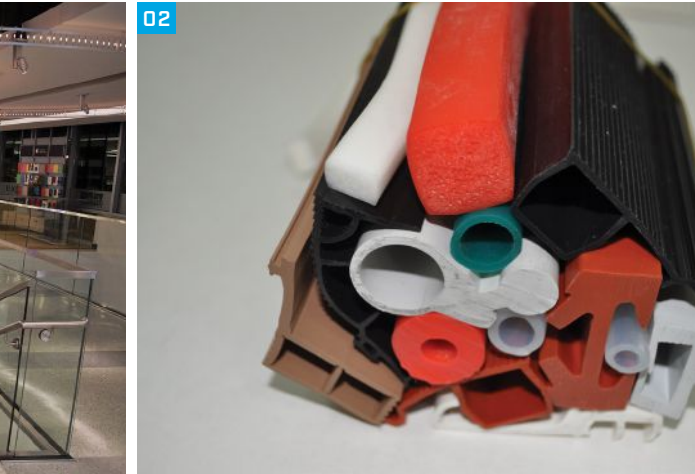
RAILINGS AND PARTITIONS

BTS Aluminium (not pictured)

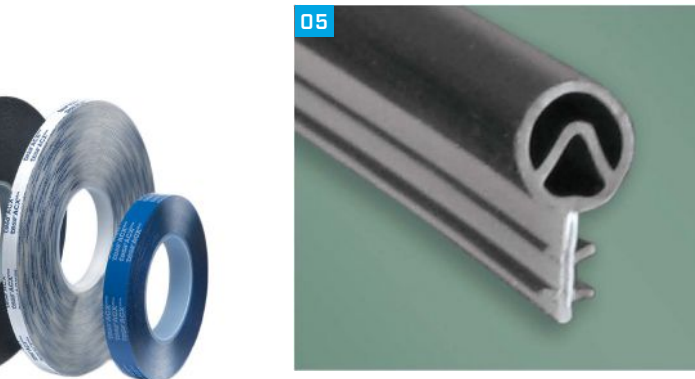
BTS Aluminium will exhibit its glass wall guillotine system. This system is a vertical sliding glass system that can be used in restaurants, cafes, hotels, and residential and industrial buildings. The Buralco guillotine glass wall system contains motorized and vertically-sliding panels controlled by 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

01/ 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



02



05



03

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

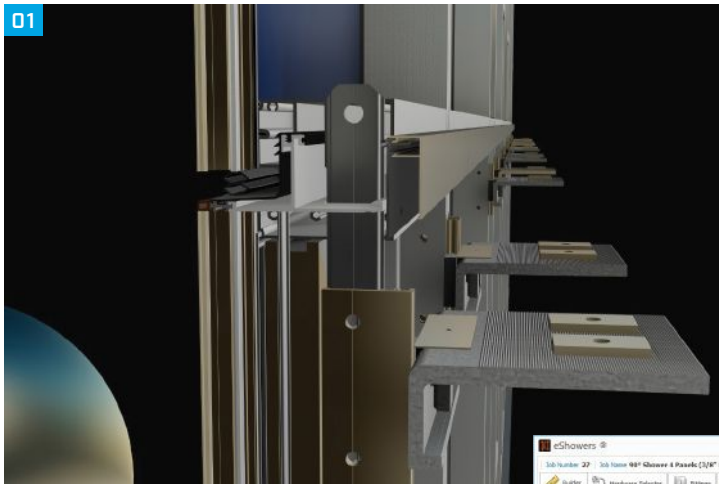
800/426-2181 | TESATAPE.COM

05/ Ultrafab Inc.

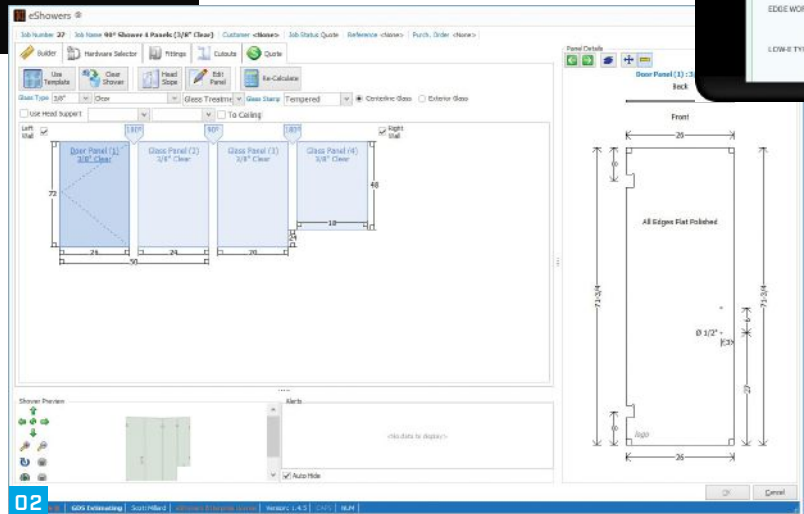
Ultrafab Inc. will display its multi-hollow bulb sealing technology in Las Vegas. During the early stages of compression, the seal requires minimal force; and at later stages of compression, the outer bulb makes contact with the inner bulb and closing forces build rapidly to provide high sealing pressure 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

01



03



02

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

FeneTech Inc. (not pictured)

FeneTech Inc. presents its latest release of FeneVision, which allows employees to see exactly what is happening on the production floor. FeneVision controls production using tools including web- and client-based quotation, order management, pricing, costing, CAD, a shower door designer, dynamic creation of BOMs, capacity planning, scheduling, glass cutting optimization, lineal optimization, tracking, mobile delivery, invoicing, return merchandise

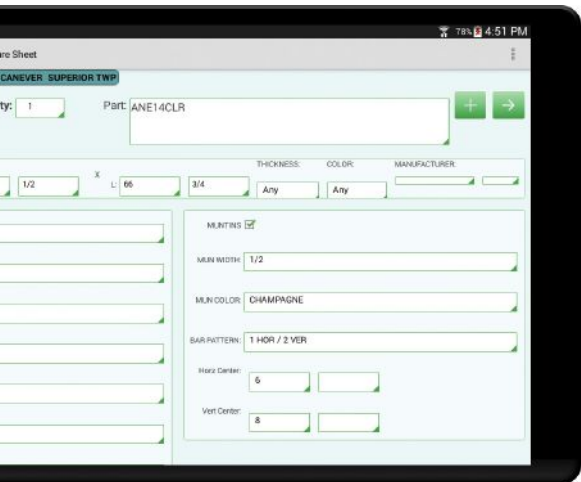
authorization, CRM, and reporting. Also showcased in Las Vegas, the FeneVision LineScanner features a new anisotropy check and edge stress check for heat-treated glass. Booth #1563 330/995-2830 | fenetech.com

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. EShowers, 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



Measure sheet created in the MobilePro tech app

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.

Mainstreet Computers Inc. will present its complete line of products and services: Glas-Avenue Point of Sale software provides business management, inventory and accounting solutions; MobilePro, its mobile app for techs and estimators, provides paperless, seamless communication between the office and the field with real-time updating of critical job information; and web services for website design, hosting, SEO and mobile marketing. Booth #1657
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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info@fenetech.com.



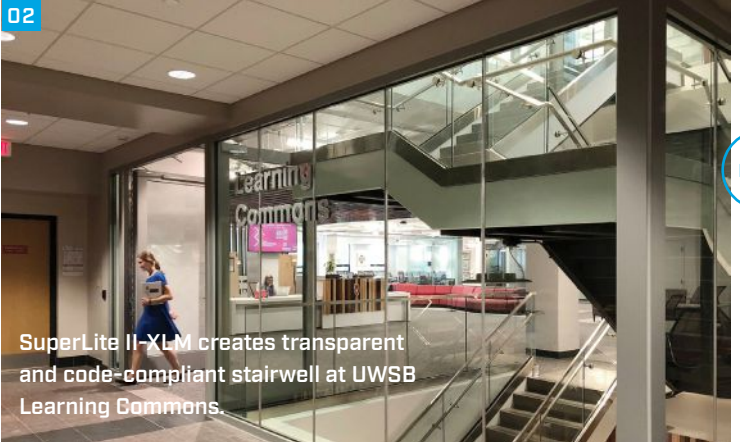
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North America 330.995.2830 | Europe 1 + 352 26 39 84 | fenetech.com

NEW



01 Glassopolis' Yev Beznosov inspects new Schott Pyran Platinum.



02 SuperLite II-XLM creates transparent and code-compliant stairwell at UWSB Learning Commons.

NEW



03

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 applica-

tions 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

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September, 12th - 14th, 2018



S | E | A



Stylmark interior glass wall system at M Casino

01

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 3/8-inch, 1/2-inch, 5/8-inch and 3/4-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

02



NEW

TOOLS AND SUPPLIES

02/ EDM

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 | EDM.COM

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Booth 2263

ITA, GIMAV, VITRUM

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MACOTEC

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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



02

Solid rectangle rubber seal



03



04



TOOLS AND SUPPLIES

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
877/977-7299 | 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

TRANSPORTATION AND HANDLING

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 counter-balance 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
877/266-2456 | COMBILIFT.COM



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NEW



04



05



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 PlumLine is compact, allowing users to have hydraulic controls in tight spaces of as little as 4 feet. The PlumLine 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.



03



NEW

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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01



Winlet 1265

02



03



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

01 / 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

02 / 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 #945 815/931-4825 | SMARTLIFTUS.COM

03 / 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

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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



01

02



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

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



Booth 1863

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SCHEDULE-AT-A-GLANCE

SCHEDULE AS OF PRESS TIME, JULY 2. SCHEDULE AND TOPICS ARE SUBJECT TO CHANGE. FOR THE MOST UP-TO-DATE SCHEDULE, VISIT GLASSBUILDAMERICA.COM. ALL GLASSBUILD AMERICA EVENTS WILL TAKE PLACE AT THE LAS VEGAS CONVENTION CENTER, UNLESS OTHERWISE NOTED.

REGISTRATION

Monday, Sept. 10

1:00 pm – 4:00 pm
*Exhibitor Only - Exhibitor VIP
Badge Pick-up*

Tuesday, Sept. 11

9:00 am – 4:00 pm
*Exhibitor Only - Exhibitor Registration
& VIP Badge Pick-up*

Wednesday, Sept. 12

8:00 am – 6:30 pm

Thursday, Sept. 13

7:30 am – 4:00 pm

Friday, Sept. 14

8:00 am – 1:00 pm

EXHIBIT HALL

Wednesday, Sept. 12

10:00 am – 6:30 pm
*Includes GlassBuild Opening Reception
from 5:00 pm – 6:30 pm*

Thursday, Sept. 13

10:00 am – 5:00 pm

Friday, Sept. 14

10:00 am – 2:00 pm

MONDAY, SEPT. 10

Exhibitor VIP Badge Pick-up

1:00 pm – 4:00 pm

TUESDAY, SEPT. 11

Exhibitor Registration & VIP Badge Pick-up

9:00 am – 4:00 pm

Fall Conference

8:00 am – 6:30 pm
*Las Vegas Convention Center
Separate registration required.*

WEDNESDAY, SEPT. 12

Registration Open

8:00 am – 6:30 pm

Fall Conference

8:00 am – 10:00 am
*Las Vegas Convention Center
Separate registration required.*

13th Annual Glazing Executives Forum

8:00 am – 6:30 pm
*Las Vegas Convention Center
Separate registration required.*

Exhibit Hall Open

10:00 am – 6:30 pm

Express Learning

11:30 am – 5:00 pm
*Express Learning Theater / Booth 913
Free to all registered attendees.*

Action Demonstrations

10:30 am – 4:30 pm
*Exhibit Hall
Free to all registered attendees.*

GlassBuild Opening Reception

5:00 pm – 6:30 pm
*Trade show floor – North Halls N1 - N4
Attendees can meet with friends and col-
leagues while enjoying refreshments, live
entertainment and fun activities on the
trade show floor.
Free to all registered attendees.*

THURSDAY, SEPT. 13

Registration Open

7:30 am – 4:00 pm

Fall Conference

8:00 am – 10:00 am
*Las Vegas Convention Center
Separate registration required.*

Exhibit Hall Open

10:00 am – 5:00 pm

Express Learning

11:00 am – 5:00 pm
*Express Learning Theater / Booth 913
Free to all registered attendees.*

Action Demonstrations

10:30 am – 4:30 pm
*Exhibit Hall
Free to all registered attendees.*

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.*

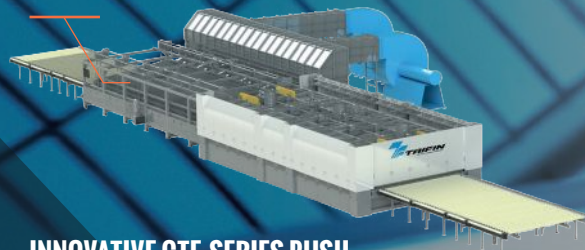
GLAZING EXECUTIVES FORUM*

**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.

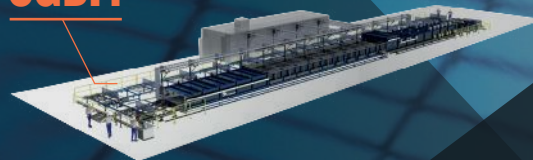
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With many companies seeking to capitalize on growing demand, this year's forum will help glazing company owners and managers grow profits, expand their reach and lay the foundation for long-term success. All events take place at the Las Vegas Convention 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, itreconomics.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

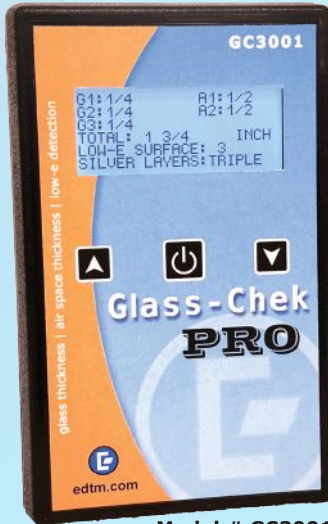
Presented by Max Perilstein, founder and managing partner of Sole Source Consultants, salesourceconsultants.com. While social media can be a critical element of marketing and connecting with customers, it is not without its pitfalls and



Glass Replacement Made Easy

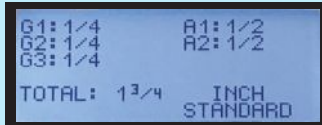
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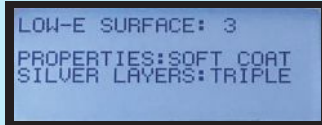


Model # GC3001

Easy to Read Display



Glass Thickness Results



Low-E Location & Type Results

Glass-Chek PRO vs. Glass-Chek ELITE

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

Award Winning: Glass-Chek ELITE



Model # GC3200

- 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
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- Able to store 30 Measurements

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Model # AE1601

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See you there!

NGA

GLASSBUILD AMERICA 2018

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

Presented by Matt Johnson, an attorney with The Gary Law Group, prgarylaw.com. 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

Presented by Marco Terry, managing director of Commercial Capital LLC, com-capfactoring.com.

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

Presented by Dustin Anderson, president of Anderson Glass & Mirror Co., anderson-glasstexas.com.

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

Presented by Katy Devlin, editor in chief, Glass Magazine, glassmagazine.com, and Giroux Glass, girouxglass.com.

The exit process is fraught with road blocks, 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

Presented by Dustin Anderson, president of Anderson Glass & Mirror Co., anderson-glasstexas.com.

4:30 pm

Navigating the Challenges of Exit Planning and Succession

Presented by Katy Devlin, editor in chief, Glass Magazine, glassmagazine.com, and Giroux Glass, girouxglass.com.

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

Presented by Max Perilstein, founder and managing partner of Sole Source Consultants, salesourceconsultants.com.

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ABC Hardware Inc.	739	Bid Unity	1139
Access Hardware Supply	813	Billco Manufacturing Inc.	2451
Adelio Lattuada Srl	2363	Blink Blinds + Glass by ODL	727
ADI SPA - IGP INC.	2163	Bohle America	617
AKARMAK	2113	Bondtech Corp.	2738
Akzo Nobel Coatings Inc.	227	Bottero Flat Glass Inc.	2173
Alumax Bath Enclosures	1347	BOVONE	2375
ALURO	1854	BROMER	2851
Ameri-Can Machinery Ltd.	2351	BTS Aluminium	338
American Renolit Corp.	863	Bystronic Glass Inc.	1127
American Shower Door	464	C.R. Laurence - U.S. Aluminum	1227
AmesburyTruth	1045	Caldwell Manufacturing Co.	1163
Anthony Innovations	1270	Capital One	1476
AquaSurTech OEM	313	CardConnect	1275
Arcadia Inc.	365	Cardinal Paint and Powder	1611
Architectural Glass & Metal Certification Council	1574	Casso-Solar Technologies LLC	963
Architectural Grilles & Sunshades	1572	Chelsea Building Products	1263
Argon Filling Systems Inc.	1753	China Liaoning North Glass Machine Co. Ltd	2007
Arizona Shower Door Inc.	855	Chung How Paint Factory Co. Ltd.	1673
Arkema Inc.	1776	ClearShield Technologies	468
ASSA ABLOY	263	CLINE Aluminum Doors Inc.	851
Bacon's Architectural Muntins ('BAM')	1176	CMS North America Inc.	2915
Bailey Specialty Cranes & Aerials	1877	Combilift	1847
Bavelloni America Inc.	2963	Consolidated Glass Holdings	751
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Door & Window Hardware Co.	869	F. Barkow Inc.	1241
Door Controls USA Inc.	309	FAPIM SPA	1627
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FOM USA	2711	GlassTrax	1845
Forel North America	3127	Glaston America Inc.	2927
Forel S.p.A.	3127	GlasWeld	1479
Forvet S.r.l. / IGE	2207	Goldstar Co. Ltd.	337
Foshan Shunde SiKe Glass Machine Co. Ltd.	513	GPI Group	741
FrontLine Bldg. Products Inc.	766	Grove Structural Shims	1472
Gardner Glass Products	308	Groves Inc.	2753
Garibaldi Glass Industries Inc.	1247	Guangdong Enkong Machinery Co. Ltd.	3071
GDS Estimating	444	Guangzhou Baojun Glass Material Co. Ltd. / IGE	2207
GED Integrated Solutions	2127 & 2327	Guardian Glass	627
GGI	1133	Guilin Champion Union Diamond Co. Ltd.	218
Glass Accessories Int'l	1379	GULF Rubber Industries LLC	412
Glass Coating & Concepts	413	Gunther Mirror Mastics	312
Glass Magazine™	927	H.B. Fuller	937
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HMI Cardinal	1037	LaPel Solutions	327
HOPD Inc.	1463	Larson Manufacturing Co. Inc.	811
HOPPE North America Inc.	755	Laser Products Industries	1710
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Hot Melt Technologies Inc.	2947	Lauren Manufacturing	527
Houston Foam Plastics Inc.	1614	Laurentide Industrial Coatings	667
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ICA North America	455	Linde	221
IGE Supply Solutions Inc.	2207	Linetec	712
IGMA	927	LiSEC	1963
IMS USA LLC	2904	LiteSentry Corp.	2008
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Integrated Automation Systems	3053	Luoyang Mountain Glass Technology Co. Ltd.	2555
Interlayer Solutions Inc.	763	Machines and Wheels	1863
Interlock USA	1445	Macotec	2563
Intermac	2727	Maglev Glide	876
International Door Closers	1577	Mainstreet	1657
Intex Glass (Xiamen) Co. Ltd.	1610	Manitex Valla	1068
Intigral Inc.	1545	Mapes Panels LLC	849
ISEO SERRATURE	772	MAPPI America	2263
ITA - Italian Trade Agency	2463	MARINE FASTENERS INC.	1372
J&S Machine Inc.	1762	Matodi	1949
Jade Hardware Co. Ltd.	669	MAZZAROPPI ENGINEERING SRL	3170
Jinzhou Fortune Spring Glass Co. Ltd.	339	MCKEEGAN EQUIPMENT	1754
JLM Wholesale	1219	McThermo	563
Joe's Refrigeration Inc. - Clean Room Solutions	1850	Meshtec Advanced Screen Systems by Unique Home Designs	769
John Evans' Sons Inc.	709	Midwest Wholesale Hardware	1766
Jordon Glass Machinery	1853	Millet Glass Industry	329
Joseph Machine Co.	3115	Milspec Industries	1651
Keraglass	2135	Mole Moreschi Srl	2569
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Ningbo Rieche Machinery Co. Ltd.	608	Polytronix Glass	1671
Novagard Solutions	812	Preference North America Inc.	427
NuCoat North America	539	Pres-On Corp.	363
Demme S.p.A.	1826	PRL GLASS SYSTEMS	239
OpenJanela	762	PRL GLASS SYSTEMS	241
OPTIMA	2269	Process Label Systems Inc.	316
Orgadata USA LogiKal	1235	Prodiamonds Hardware Co. Ltd.	440
Oz Machine	2505	Prodim USA	1909
Ozone India	1473	Progress Power-Saving Glass	1751
P.H. TECH	1639	Protectapeel by Spraylat International	570
Palmer Mirro-Mastics	814	Putsch Group	1809
Parker Machinery Co. Ltd. / IGE	2207	Qingdao Laurel Glass Technology Co. Ltd.	668
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Quattrolifts	517	Soudal	808
Radisson Industries	127	South Glass Technology Co. Ltd.	2104
Ramapo Glass Specialists	827	Southern Stretch Forming	708
Ray-Bar Engineering Corp.	428	Spider By BrandSafway	1215
ReachMaster Inc.	1633	Spil & Perfect Cut Software	2214
RINOX Midwest USA	536	Sprayway Inc.	1213
RiteScreen	446	Spray-X	1350
Rizhao Huaye Glass Co. Ltd.	456	Stainless Structural	834
Rochester Insulated Glass	1378	Standard Bent Glass Corp.	1349
ROCKWELL SECURITY INC.	1238	Star Srl	2169
Roto North America	837	Stretch Solutions	534
S.E.A. Group - wet processing machinery	2545	Strybuc Industries	1171
SAF Southern Aluminum Finishing	1620	Stürtz Machinery Inc.	3163
SAFTI FIRST	968	Stylmark Inc.	611
SALEM Flat Glass & Mirror	2763	Surface Armor LLC	1373
Schiatti Angelo Srl	2663	Tag Railing Inc.	1450
Schmalz Inc.	2805	TaiFin Glass Machinery Oy	1871
Scotchman Industries	1862	Target Hardware Factory	436
Screenco Manufacturing Ltd.	745	TBP Converting	735
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Security Lock Distributors	1273	Tenon Beijing Equipment - TSS Sales & Service - CoolTemper	3249
SELECT Hinges	426	tesa tape inc.	1750
SEVASA	345	Tilt Lock Patented Glass Railing Systems	435
SGC International Inc.	318	TK Srl	2469
SGU Glass Technologies Co. Ltd.	2706	Tremco Inc.	419
Shandong Fangding Safety Glass Technology Co. Ltd.	2005	TRIM-LOK INC.	944
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Shanghai Pad Automatic Doors Technology Co. Ltd.	353	Tsubaki KabelSchlepp	2644
Shenzhen Oster Film New Materials Co. Ltd. / IGE	2207	Tubelite Inc.	713
Shunde Golive Glass Machinery Co. Ltd.	2009	Tuff-N-Lite	512
Sika Corp.	233	Tuomas / IGE	2207
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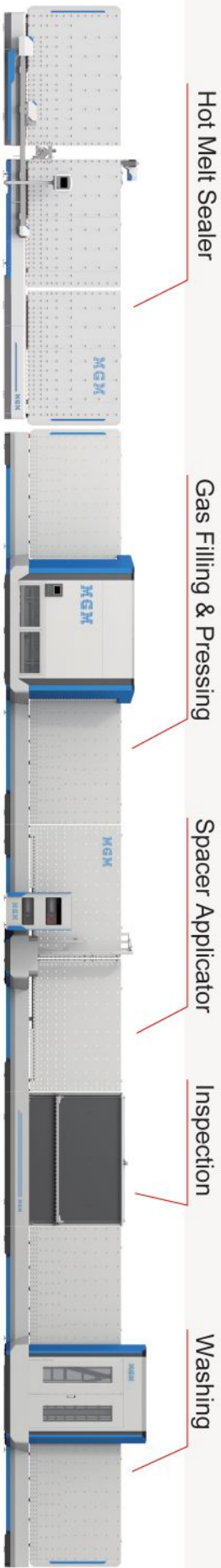
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Vesuvius	1770
VETRILITE	1618
Vetrotech Saint-Gobain	809
VG SmartGlass	356
Vicone High Performance Rubber	441
Vidriera del Cardoner S.A.	126
VIG Technologies / IGE	2207
Viprotron GmbH	1908
Vision Hardware Inc.	1063
Vitro Architectural Glass (formerly PPG)	817
VITROSEP S.L. / IGE	2207
VITRUM S.r.l. - GIMAV	2463
Wagner Companies	838
Wakefield Equipment	2549
Walker Glass Co.	319
Water Treatment Solutions	2643
Weldco Glass Racks	1775
Window & Door Dealers Alliance (WDDA)	927
Window & Door™	927
Windowmaker Software Ltd.	122
Windspec	1655
Witte North America	1714
Wood's Powr-Grip	1715
WorldOfGlassMap	927
Wrisco Industries Inc.	414
WTS Paradigm	662
YORGLAS - Cam Merkezi Sanayi Ticaret A.S.	508
Yuntong Glass	1739
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BY KATY DEVLIN

“**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. ➔

E N

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.

Glass fabricators included Standard Bent Glass Co., standardbent.com, Precision Glass Products Inc., precisionglass-products.com, Northwestern Industries, nwiglass.com, and Glassfab Tempering Services, glassfabusa.com. The glass was installed by Architectural Glass & Aluminum, aga-ca.com.

Photo by Marco Garcia.

TREND WATCH

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.

“Energy [efficiency] still matters, but how does it fit into the big picture of the sustainable building movement?” asks Max Perilstein, founder of Sole Source Consulting, solesourceconsulting.com.

“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.

There is concern among manufacturers and fabricators about requirements for transparency declarations, as the process can be expensive and complex. “Many companies don’t yet



understand the process or the requirements,” Perilstein says. “But we are seeing some companies begin to get it.”

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, lintec.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.

Photos by Joshua Jay Elliott, courtesy of Works Progress Architecture and Wausau Window and Wall Systems.

considered in state procurement,” Paterson 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.”

5. Push for product performance.

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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Location: Washington DC


SAINT-GOBAIN

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 Perilstein. “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.

01



Verify the quality of the project plan

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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02



Ensure takeoffs are detailed and precise

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.

03



Track price changes

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.

04



Use a checklist

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.

05



Determine needs before costs

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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06



Provide details for all areas of the estimate

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.

07



Ask questions

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.

MYglassclass.com

Estimating Essentials from MyGlassClass.com

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:

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- *Reading Plans and Blueprints*
- *Introduction to Estimating*

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- **Additional resources** such as sample commercial plans and more.

To purchase this bundle and find more course specifics, go to MyGlassClass.com. Discounts are available to NGA members.

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

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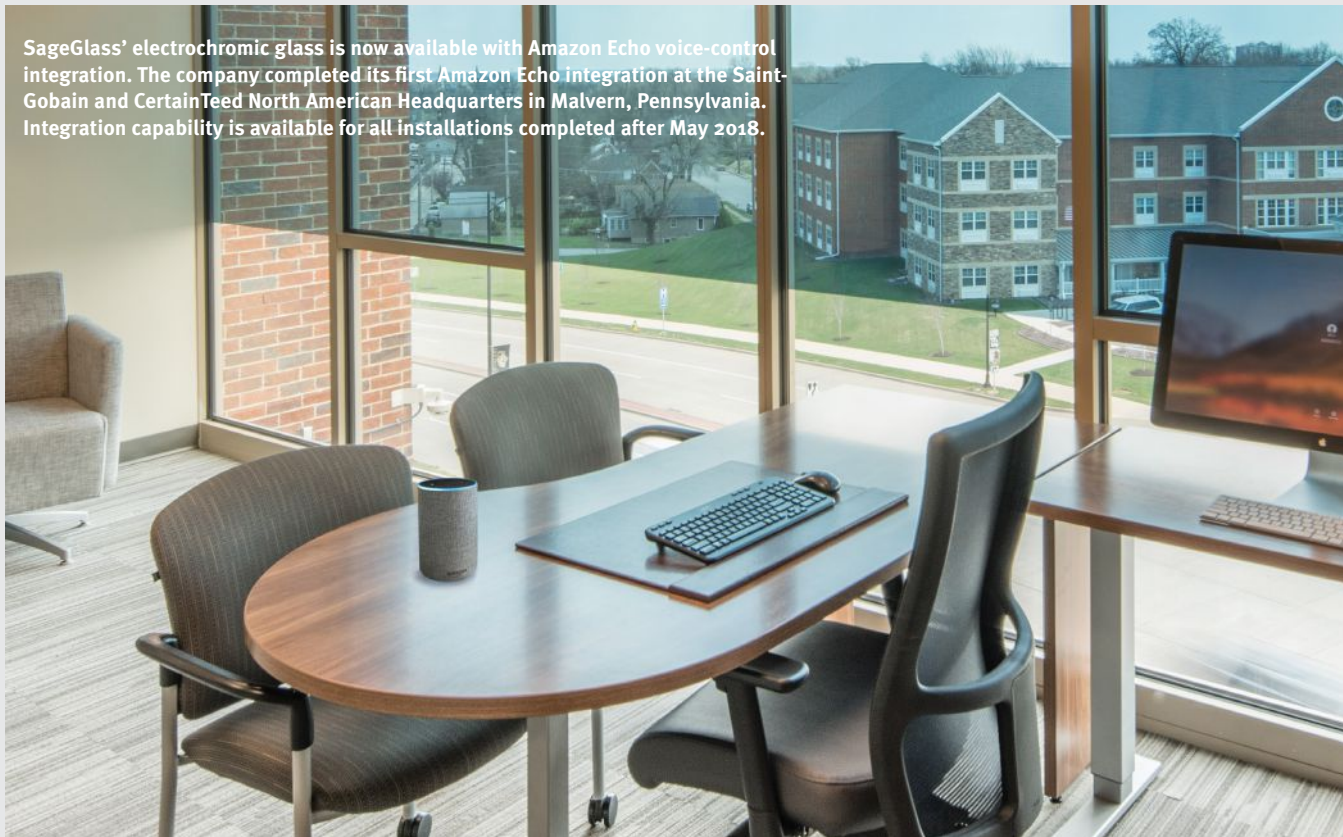
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Industry Products

SageGlass' electrochromic glass is now available with Amazon Echo voice-control integration. The company completed its first Amazon Echo integration at the Saint-Gobain and CertainTeed North American Headquarters in Malvern, Pennsylvania. Integration capability is available for all installations completed after May 2018.



Product Spotlight

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 McLennan, 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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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. 651/493-4378 | forelspa.com

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. +(34) 9867-8762-7 | tecglassdigital.com

Transportation and handling



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 weath-

er, 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 mullions 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. 800/500-8083 | extechinc.com

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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.



Dancause

Walker

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.



Debski

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,

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People

where he served as senior sales and business development manager.

Security Door Controls

Security Door Controls, sdsecurity.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



FitzGerald

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.



DeNett

representative for North Carolina and South Carolina, as well as

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.



Klein

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.

Brio USA

Steven Klein joined Brio USA, briousa.com, as a business development manager. Klein will be responsible for product

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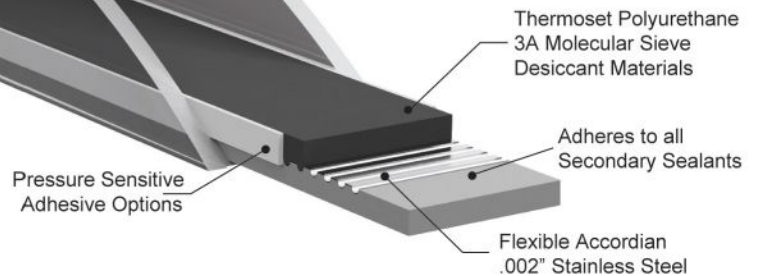
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CHINA NATIONAL SAFETY GLASS & QUARTZ GLASS TEST CENTER
 Initial Test Report
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Sample size	160mm X 160mm X 3mm			
Test equipment	LD 2010 (LD 2000) Shear press and Instron 1130 (IN 1130) Tensile strength test machine LD 1000 (LD 1000) Tensile test machine LD 1000 (LD 1000) Tensile test machine LD 1000 (LD 1000) Tensile test machine			
Ambient temperature	23°C			
Test date	2020/04/06			
Notes: All test results are based on the average of 5 specimens of the test specimens. All test results are based on the average of 5 specimens of the test specimens. All test results are based on the average of 5 specimens of the test specimens.				
Standard requirements	GB 15763.2-2005			
Sample No.	Origin	Test of temperature	Result	Remarks
1	WT20	23	合格	No contamination or break
2	WT20	23	合格	No contamination or break
3	WT20	23	合格	No contamination or break
4	WT20	23	合格	No contamination or break
5	WT20	23	合格	No contamination or break
6	WT20	23	合格	No contamination or break
7	WT20	23	合格	No contamination or break
8	WT20	23	合格	No contamination or break
9	WT20	23	合格	No contamination or break
10	WT20	23	合格	No contamination or break
Test item conclusion	Pass			
Remarks				

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 Test Report
 Report Number: WT2020040006 Page 1 of 5

Sample size	160mm X 160mm X 3mm			
Test equipment	LD 2010 (LD 2000) Shear press and Instron 1130 (IN 1130) Tensile strength test machine LD 1000 (LD 1000) Tensile test machine LD 1000 (LD 1000) Tensile test machine LD 1000 (LD 1000) Tensile test machine			
Ambient temperature	23°C			
Test date	2020/04/06			
Notes: All test results are based on the average of 5 specimens of the test specimens. All test results are based on the average of 5 specimens of the test specimens. All test results are based on the average of 5 specimens of the test specimens.				
Standard requirements	GB 15763.2-2005			
Sample No.	Origin	Test of temperature	Result	Remarks
1	WT20	23	合格	No contamination or break
2	WT20	23	合格	No contamination or break
3	WT20	23	合格	No contamination or break
4	WT20	23	合格	No contamination or break
5	WT20	23	合格	No contamination or break
6	WT20	23	合格	No contamination or break
7	WT20	23	合格	No contamination or break
8	WT20	23	合格	No contamination or break
9	WT20	23	合格	No contamination or break
10	WT20	23	合格	No contamination or break
Test item conclusion	Pass			
Remarks				

People



Metcalfe

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.



O'Neill

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.




Walker

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



Yglesias

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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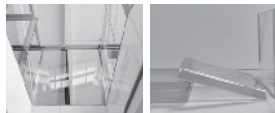
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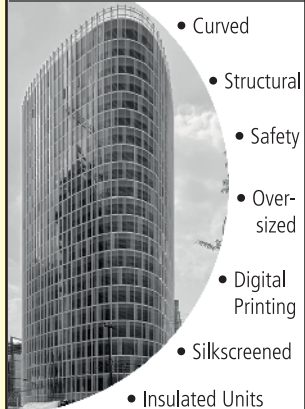
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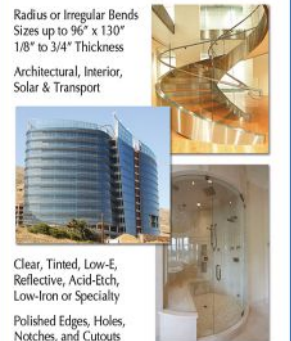
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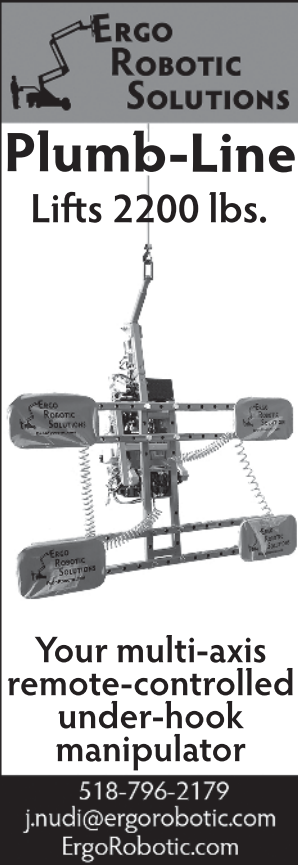
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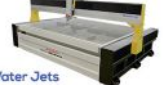
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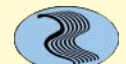
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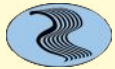
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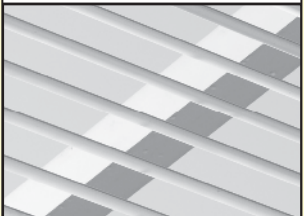
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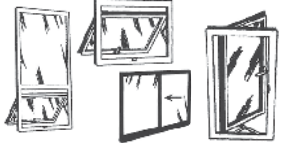
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Thad Ziegler Glass Invests in the Community



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, zieglershowerdoors.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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