

ADVERTISEMENT

GLASS

MAGAZINE[®]

THE GLASS AND GLAZING AUTHORITY

GLASSMAGAZINE.COM

REDEFINE
PRODUCTIVITY.



EQUIPMENT
Resources



HHH Equipment Resources has a bold lineup of tempering furnaces specifically designed to reduce downtime, improve quality, and redefine your standards of productivity.

Start redefining productivity today.

hhhglassequipment.com/furnaces

A division of **Salem Fabrication Technologies Group, Inc.**

hhhglassequipment.com | 724-304-9430

**THE
DIFFERENCE
IS CLEAR.**

GLASS

MAGAZINE®

THE GLASS AND GLAZING AUTHORITY • MARCH 2021

GLASSMAGAZINE.COM

OFFICIAL
PUBLICATION

NGA
NATIONAL GLASS ASSOCIATION with GANA

GLASS.ORG

A NEW REALITY

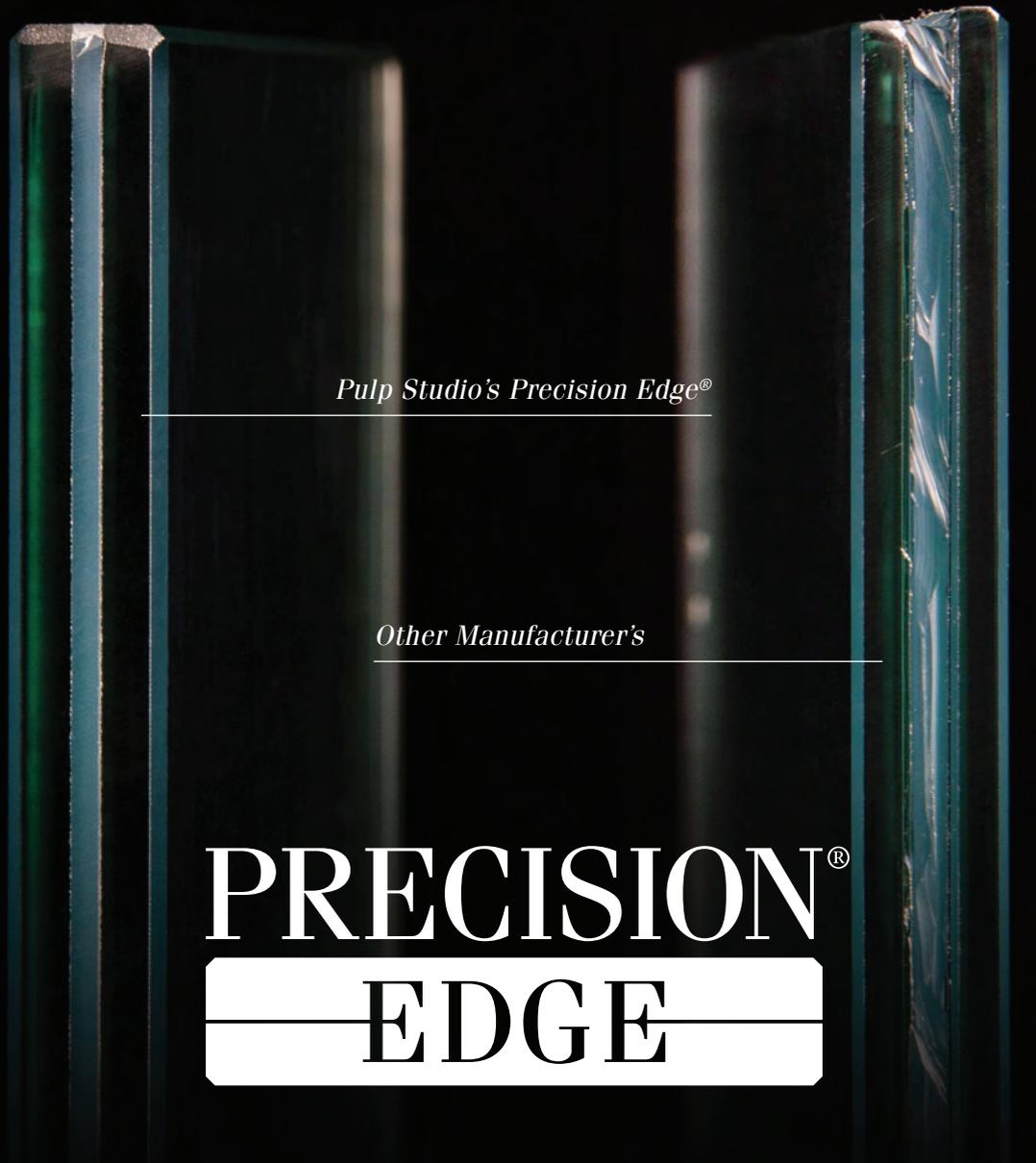
FOR TOP GLASS FABRICATORS

MANUFACTURING
CHALLENGES, PRODUCT
INNOVATIONS AND A
MARKET SHAKEN BY THE
PANDEMIC

5 DECORATIVE GLASS
TRENDS

EXCLUSIVE WITH OBE'S
NEW PRESIDENT

40+ YEARS OF
GLASSWERKS



Pulp Studio's Precision Edge®

Other Manufacturer's

PRECISION[®]

EDGE

The exposed edges on glass handrails are an aesthetic detail you don't want to overlook. Codes only require that handrail glass be laminated, but high-quality edgework is imperative for the integrity of the design. Never feel pressured to accept a pre-polished laminate product when you have better options.

Precision Edge[®] complements the design by providing a high-quality, zero-tolerance finish, with perfect alignment for both tempered and annealed laminated glass.

FIRE RATED STAIRWELLS REIMAGINED

Project: University of Wisconsin School of Business | Architect: Potter Lawson and MSR | Glazier: Omni Glass & Paint Learning Commons in Madison, WI



FULL VISION 90-MINUTE
TEMPERATURE RISE
DOORS **UP TO 10 FT.**

**FIRE RESISTIVE
ALUMINUM** DOOR &
FRAMING SYSTEM

CLEAR FIRE RESISTIVE
BUTT-GLAZED WALLS

ASTM E119/UL 263
FIRE RESISTIVE
GLASS & FRAMING

LOW-IRON
MAKE-UPS
AVAILABLE

This stairwell maximizes daylight and transparency without compromising fire safety with **SuperLite® II-XLM 120** clear butt-glazed walls in **GPX® Architectural Series** perimeter framing. **SuperLite® II-XL 90** in **GPX® Architectural Series Aluminum Doors** provide a sleek, full-vision entrance system that compliment the overall aesthetic.

LEARN MORE

Visit www.safti.com or call us at **888.653.3333** today to see how your project can benefit from our comprehensive line of advanced fire protective and fire resistive **openings, entrances, storefronts, curtain walls and floors up to 2 hours**. Proudly USA-made.



Titan Metal Products
USA



SAFETY AND FIRE TECHNOLOGY INC.

GLASS

M A G A Z I N E

MARCH 2021 | GLASSMAGAZINE.COM

NGA
NATIONAL
GLASS ASSOCIATION
with GANA

OFFICIAL PUBLICATION

FEATURES

32. **Top Glass Fabricators**

A New Reality: Fabricators push through unpredictable pandemic market with new manufacturing challenges

BY NORAH DICK

34. The List

38. Sales & Markets

42. Products & Investments

44. Pandemic Challenges

46. **5 Decorative Glass Trends to Watch**

How to keep up with demand for larger sizes, more vibrant colors, bird-friendly products and more

BY KATY DEVLIN

INSIGHTS

20. **Closer Look**

Get to Know Liz Haggerty, the New President of Oldcastle BuildingEnvelope

BY KATY DEVLIN

23. **Viewpoint**

Take Five with Randy Steinberg: Glasswerks owner discusses 47 years in glass

BY MAX PERILSTEIN

26. **Code Watch**

Understanding the Requirements for Glass Railings and Guards

BY THOM ZAREMBA

29. **Performance Matters**

Keep Cost and Durability in Mind in the Pursuit of Sustainability

BY JOE ERB

DEPARTMENTS

- 8. Editor's Notes
- 10. From the NGA
- 13. Glass Informational Bulletin
- 16. News to Know
- 31. Great Glazing: NSG Group
- 60. Product Solution: Oldcastle BuildingEnvelope®
- 61. Products
- 66. People
- 67. Classifieds
- 68. Suppliers Guide
- 81. Reader Response Center
- 82. Here's an Idea

Bird-friendly glass at the Cedar River Municipal Watershed. Photo by Walker Glass.

ON THE COVER:

A leading trend in decorative glass: digital printing. On the cover is a wall of digitally printed glass that greets visitors to the Lowell Justice Center in Lowell, Massachusetts. The glass is DigitalDistinctions printed glass from Viracon. Check out more top decorative glass trends on page 46.





GLASSFAB
TEMPERING SERVICES, INC.

“Raise Your Glass With Excellence”



CERTIFICATIONS



ONLINE

AT GLASSMAGAZINE.COM

YOUTUBE.COM/GLASSMAGAZINE

TWITTER.COM/GLASSMAG

INSTAGRAM.COM/GLASSMAGAZINENGA

FACEBOOK.COM/GLASSMAGAZINENGA



SIGN UP FOR OUR DIGITAL EDITION

GLASS WEEKLY NEWSLETTER AND DIGITAL EDITION: Subscriptions available under the "Subscription Services" tab on GlassMagazine.com

BONUS ISSUE CONTENT

Available at GlassMagazine.com

ANALYSIS

Read updates and analysis from the biggest news stories of the month.

EDUCATION

Access coverage and resources from the AIA CE sessions from the NGA Glass Conference.

PROJECT GALLERY

See innovative and ambitious project case studies from the 2021 Top Glass Fabricators.

GLASSBLOG



2021 OUTLOOK

This Year Must Be Better than the Last
By Janice Yglesias, Fenestration & Glazing Industry Alliance



TOUGH NEWS

What happens next with JE Berkowitz and CCBP?
By Max Perilstein, Sole Source Consulting



R&D

Open Innovation for the Glass Industry
By Chris Phillips, Showcase Shower Door

PROJECT NEWS



Check out project case studies from Top Glass Fabricators and more at GlassMagazine.com. To submit projects, write Norah Dick, ndick@glass.org. **Pictured:** The new HFHS Detroit Pistons Performance Center, the 175,000-square-foot headquarters for the Detroit Pistons, from fabricators Glass & Metal Craft and Viracon.

Glass Magazine® [ISSN 0747-4261], Volume 71, Number 2, is published eight times annually in January/February, March, April, May/June, July, August, September/October and November/December by the National Glass Association, 1945 Old Gallows Road, Suite 750, Vienna, VA 22182; 703/442-4890. There is no charge for subscriptions to qualified requestors in the United States. All other subscriptions will be charged \$49.95 in the U.S., and \$79.95 outside the U.S. Periodicals postage paid at Vienna, Va., and other mailing offices. POSTMASTER: Send changes of address to Glass Magazine®, Subscriptions, Box 460, Congers, NY 10920. Canada Post: Publications Mail Agreement #40612608. Canada Returns to be sent to Bleuchip International, P.O. Box 25542, London, ON N6C 6B2. For all subscription inquiries, please call 1-800-765-7514. ©2020 National Glass Association. All Rights Reserved. Printed in the U.S.A.

GLASS MAGAZINE

Published by the

NGA NATIONAL GLASS ASSOCIATION
with GANA

1945 Old Gallows Rd., Suite 750
Vienna, VA 22182-3931
P: 703/442-4890 F: 703/442-0630

EDITORIAL

Content Director

Jenni Chase • jchase@glass.org

Associate Publisher, Editor-in-Chief

Katy Devlin • kdevlin@glass.org

Associate Editor
Norah Dick

Creative Lead
Cory Thacker

Senior Manager, Digital Media
Bethany Stough

Production Director
Beth Moorman

Web Editor
Wendy Vardaman

Circulation Manager

Jo Ann Binz

jbinz@glass.org • 843/388-3808

ADVERTISING

Executive Publishing Account Managers

Chris Hodges

chodges@executive
publishing.com • 410/459-8619

Mike Gribbin

mgribbin@executive
publishing.com • 410/459-0158

Tim O'Connell

toconnell@executive
publishing.com • 443/717-1425

NGA BOARD OF DIRECTORS (2020-21)

Chair
Cathie Saroka
Goldray Glass

Chair-Elect
Guy Selinske
American Glass &
Mirror Inc.

Treasurer
Doug Schilling
Schilling Inc.

Immediate Past Chair
Chris Bole
Pikes Peak Glass

Denise Bardwell Baker
Spring Glass & Mirror

Brian Hale
Hale Glass Inc.

Courtney Little
Ace Glass

Ron Crowl
FeneTech Inc.

Tim Kelley
TriStar Glass Inc.

Rick Locke
Windows, Doors &
More Inc.

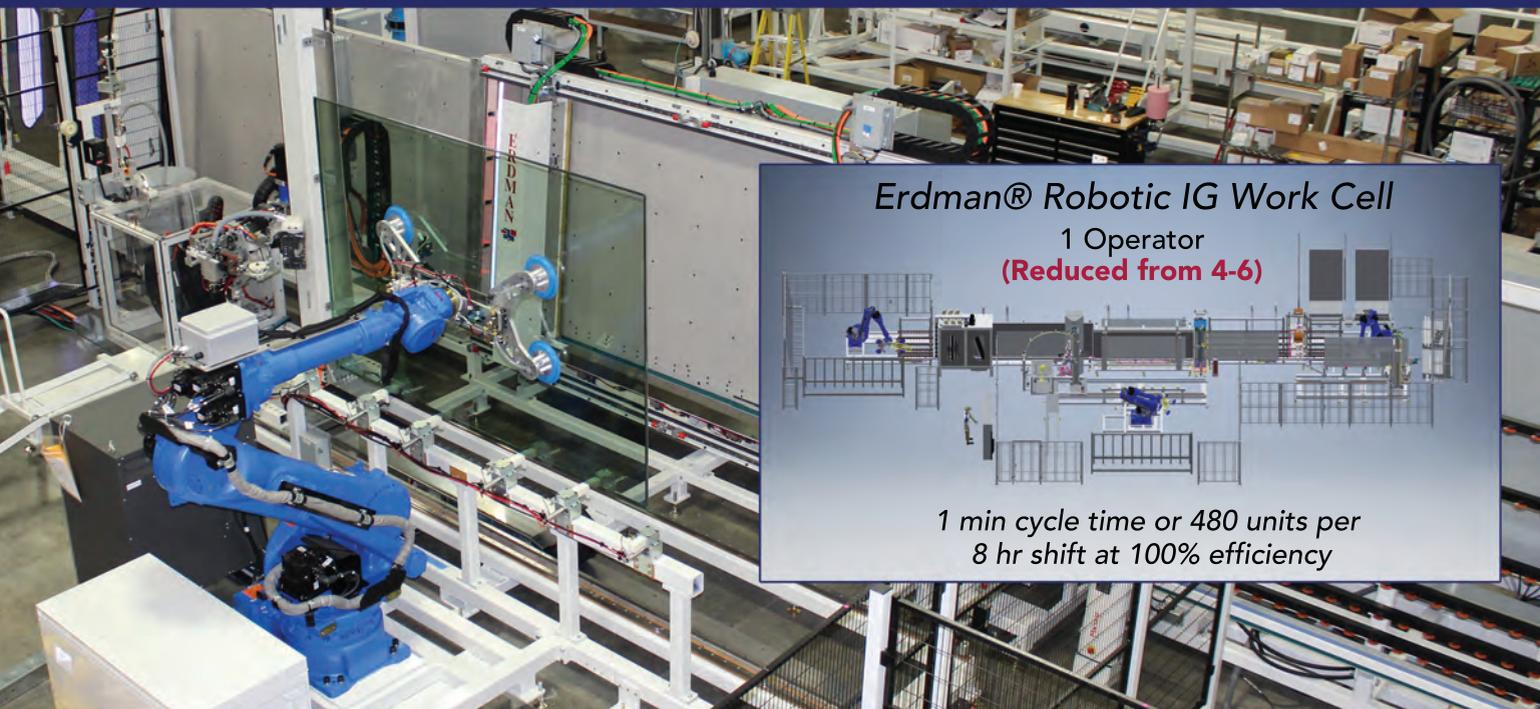
Chris Doan
Guardian Glass

Silas Koonse
Koonse Glass Co. Inc.

Jim Stathopoulos
Ajay Glass Co. NA

President & CEO
National Glass Association
Nicole Harris

WE'VE BEEN CHAMPIONING
SOCIAL
DISTANCING
EVEN BEFORE THERE WAS
SOCIAL DISTANCING.



Erdman is your local partner in robotics and automation. We will work with you to innovate and reduce your labor requirements to provide a safer environment at your facility as well as a significant cost savings.

Erdman is unique in that we focus on all facets of window manufacturing and can help you integrate your departments and create a safer, more efficient flow through automation.

For 27 years we have concentrated completely on the North American market. We started small, service focused, nimble and innovative. We continue that focus today even as we are big enough to handle the largest of projects.

Visit www.erdmanautomation.com or call 763-389-9475 for more information.

VISIONARY THINKING. EXCEPTIONAL DOING.

ERDMAN 

Keep an Eye on the Green Horizon

FOUR CODE AND REGULATORY TAKEAWAYS FROM THE NGA GLASS CONFERENCE



KATY DEVLIN
Editor-in-Chief
kdevlin@glass.org

The National Glass Association held its winter NGA Glass Conference in February. At the top of the agenda for the virtual meeting: new energy and environmental codes and regulations that will impact the glass industry, driving product trends and asking more from companies. Some key items to watch:

1. Glassmakers meet California emissions targets, for now.

The Buy Clean California Act, known as AB262, requires that the state's Department of General Services sets maximum acceptable Global Warming Potential carbon emissions targets for certain building products, including flat glass, going into public construction projects. The targets are based on Environmental Product Declarations as part of a product's Life Cycle Analysis. The industry celebrated a major advocacy win in January, when California's DGS adopted the recommended GWP targets from the NGA's Advocacy and Forming Committees.

"All glass manufacturers producing in North America will qualify for public works projects in California," says Paul Bush, NGA Advocacy Committee chair and vice president, technical services and government affairs for Vitro Architectural Glass.

"But we're not done. This is a moving target. The limit is set to be reevaluated every three years. We will likely have a new and lower target coming."

Read more about the advocacy win in California on page 12.

2. Energy codes steadily progress, while cities look to more aggressive requirements.

The national energy codes are on track to continue their normal incremental advancements, says Tom Culp, NGA code consultant and owner of Birch Point Consulting. "Think about it as a continued zone shift every three years. ... It will require a steady advancement and uptake in energy-efficient technologies, while also being practical and cost effective," he says.

Industry companies should also be on the lookout for more aggressive jumps in building requirements happening at more local levels. "I sense there is a new urgency in the codes, with strong, quick action in response to climate change," Culp says. Cities such as New York, Seattle, Boston, Denver and St. Louis are making moves to institute requirements that extend beyond the energy codes. Some call for net zero targets, others are looking to institute building energy disclosure laws, limits for

existing building emissions and renewable energy requirements.

3. Bird-safe legislation is in the works in cities, states and nationally.

While cities and states have been driving the adoption of bird-safe building requirements, companies should be aware of legislation at the federal level as well. The House of Representatives passed bird-safe legislation in the 2019-2020 Congress (HR 919, which then became part of HR2) which would require any building "constructed, acquired or of which more than 50 percent of the façade is substantially altered" to be outfitted with some type of bird-safe glazing system, says Nick Resetar, shareholder, Roetzel & Andress, NGA and GICC fire/structural and safety glass consultant.

While the bill died in the Senate, "inevitably it will be back and likely put before the Senate and potentially pass, given the current makeup of the Senate," says Resetar.

The NGA released two technical documents in the last year that offer guidance on bird-safe glass (read more on page 53).

4. New energy tax credits are here.

The Energy Act of 2020, included in the December 2020 coronavirus relief bill, provides tax benefits for installing solar and for the use of other high-performance glass technologies, such as electrochromics. "There is an ongoing theme of the federal government trying to push energy efficient technologies. Be aware of the tax deductions in these areas," says Resetar. ■



Exquisite Design

Discover the **NEW** industry standard for aesthetics and performance.

The **Palisades™ S90 Bi-Folding Door** represents the next generation of movable wall systems, offering exceptional performance without compromising aesthetics and function.

- Slim 4-3/4" sightline and 12' maximum frame height enhance views
- Bottom rolling system eliminates overhead strain
- Concealed hinges create a sleek, modern aesthetic
- Thermally broken, 1" insulating glass
- Compensating channels and adjustable spacers
- NAFS CW40 Performance Grade rating

CRL[™]

A CRH COMPANY

800.421.6144 • crlaurence.com
entrance.partitions@crlaurence.com



YOUR ASSOCIATION AT WORK

NEED-TO-KNOW INFORMATION
FROM THE NGA

ON-DEMAND GLASS EDUCATION AT BEC PRESENTS

NGA officials announced the release of “BEC Presents...” online education sessions for the entire glazing and installing community. The sessions will be available beginning March 22, during the original timeframe of the NGA Building Envelope Contractors (BEC) Conference, which was cancelled due to the ongoing pandemic.

BEC Presents... will consist of quick-hitting ‘episodes’ of noteworthy educational presentations available for on-demand, convenient viewing on the association’s website. A daily email will be sent announcing each session, along with sponsor details and additional resources. There will be no charge to watch the episodes. Visit glass.org for more information.

The BEC Conference returns to Nashville in March 2022 in conjunction with Glass Processing Automation Days (GPAD), and will celebrate its 25th anniversary at Caesar’s Palace, Las Vegas, in March 2023.

NGA PRESENTS THE 2020 ANNUAL REPORT

The National Glass Association published its first annual report to highlight initiatives over the past 18 months. The 25-page report tells the story of how NGA creates value for members and the industry, illustrating its commitment to a future in which glass is the material of choice.

The annual report summarizes key points of the last 18 months as aligned by NGA’s four goals: educate, promote, advocate and grow. It spotlights the association’s online education platform MyGlassClass.com, its in-depth Glass Technical Papers and easy-to-read Glass Informational Bulletins, its range of in-person and online events, and more. The report also highlights the quick pivots from the NGA and its members in response to the COVID-19 health and economic crisis.

“The unique pandemic challenge of 2020

was met by member companies that drove hard to produce and install products to mitigate the disease impacts while also continuing development of many other innovative products and services that elevate safety and quality, add long-term value, meet and exceed code requirements, and improve overall well-being,” says Nicole Harris, NGA president and CEO. “This report reminds us of how the glazing and glass building products industry continues to address the needs of the built environment, working through the association and as individual companies.”

Harris continues, “With your support and engagement, the NGA will continue pushing forward with our vision to enhance the spaces where people live, play, learn, work and heal with glass.” ■

MARKET WATCH

MANUFACTURER OUTLOOK STRONG AT START OF 2021



Percent of manufacturers who are either somewhat or very positive about the outlook for their company.

In the fourth-quarter Manufacturers’ Outlook Survey from the National Association of Manufacturers, 74.2 percent of respondents said they were either somewhat or very positive about the outlook for their company. That number is a noticeable improvement following readings of 33.9 percent and 66 percent in the second and third quarters of 2020, according to the NAM release.

However, headwinds remain. Companies continue to cite challenges in the supply chain and hiring as the lingering negative effects of COVID-19. Just over 29 percent of respondents said their revenues will recover to pre-pandemic levels before or during the fourth quarter, while 38.3 percent said they expect their revenues to return to normal sometime in 2021, according to the release. ■

In Market Watch, the NGA presents a quick glance at one economic indicator for glass industry leaders to track as they look to identify opportunities for growth and potential challenges ahead.



**ERGO
ROBOTIC
SOLUTIONS**

**Coast to Coast
Sales & Rentals**
Financing Available



GM2000-26



**GM2000-16
with Winch**

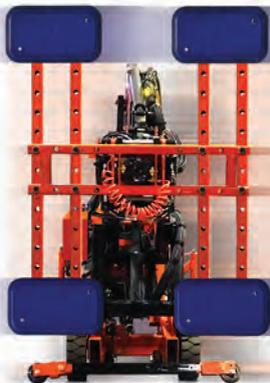
Exclusively from Ergo Robotic Solutions,
the Crab Crawl is a game-changing feature
available as an option on all GM models.

**New Feature:
the Crab Crawl!**
Sideways-Movement
Option available now
on all GM models!

Crab Crawl

**Side to side
Movement!**

Move sideways!



Call or Email Jerry j.nudi@ergorobotic.com 518-796-2179 ErgoRobotic.com

GLASS ADVOCATE

NGA Reports Advocacy Win in California

STATE DEPARTMENT OF GENERAL SERVICES SETS MAXIMUM ACCEPTABLE GLOBAL WARMING POTENTIAL LIMIT FOR FLAT GLASS AND OTHER MATERIALS COVERED UNDER CA AB262

The National Glass Association's Advocacy and Forming Committees were successful in their recommendations to the California Department of General Services to set the maximum acceptable global warming potential, or GWP, limit for flat glass and other materials covered under CA AB262.

On Jan. 1, the GWP limit was set by the California DGS at 1.72E+03 kg CO₂-eq for flat glass. This limit matches the request made by NGA's Advocacy and Forming Committees for 20 percent above the industry-wide flat glass GWP.

The established limit ensures that all North American flat glass manufacturers have the opportunity to supply glass products to government works projects in California.

"This is a win for flat glass manufacturers and their public works customers in California," says Urmilla Sowell, NGA technical services and advocacy director. "We are grateful to NGA's Advocacy and Forming Committees for their work on this issue, and to Advocacy Committee Chair Paul Bush for his leadership on this topic."

"We will continue to advance sustainability through energy-efficient and environmentally advanced glass



What is Global Warming Potential?

Global Warming Potential, or GWP, is a unit of measure to help stakeholders and sustainability programs better understand the environmental performance of glass and other products manufactured for buildings.

GWP is a measure of greenhouse gas emissions such as carbon dioxide and methane from the entire system boundary included in a product's life cycle assessment. The various greenhouse gases produced when manufacturing a product, for example, can be represented by an equivalent amount of carbon dioxide associated with the warming effect of a given quantity of a greenhouse gas. This amount is the GWP and is labeled carbon dioxide equivalent, or CO₂ eq.



ONLINE

Visit glass.org for additional updates from the NGA technical and advocacy team.

and fenestration products," says Paul Bush, vice president, technical services and government affairs for Vitro Architectural Glass. "Throughout 2021 and beyond, we intend to advocate for new opportunities for glass and the glass industry to enable the Biden-Harris Administration's renewed focus on protecting public health and the environment."

The GWP requirements are driven by the Buy Clean California Act, often referred to as AB262. The act states the Department of General Services is required to establish and publish the

maximum acceptable GWP per product. The target for the act is embedded carbon emissions of flat glass, structural steel, concrete reinforcing steel and mineral wool board insulation. When these materials are utilized in a California public works project, they must have a GWP that does not exceed the limit set by DGS.

According to NGA officials, California is an influential state in policy-making, and other states or regions often follow the lead California sets. CA AB262 could set a precedent for other locations to adopt a similar GWP limit in the future. ■



GLASS INFORMATIONAL BULLETIN

FIND MORE NGA GLASS INFORMATIONAL BULLETINS AND TECHNICAL PAPERS AT GLASS.ORG/STORE. CLICK BROWSE, THEN SEARCH KEYWORDS OR SORT BY TYPE.

Best Practices for Installed Painted Decorative Glass

Painting the backside of glass gives the application design creativity with the added benefits of clean-ability and durability of a glass surface.

The objective of this document is to define testing standards for painted glass products for interior and exterior (non-spandrel) applications. The focus will be on adhesion, compatibility, chemical durability and mechanical performance.

Paint as covering v bonded coating

Paints meant for home exteriors, vehicles or non-glass substrates are not suitable to be applied to glass. Some applicators have gone as far as mixing common paints with simple adhesion promoters, essentially creating new paint chemistries.

When unproven paint chemistries are introduced as substitutes for high-performing, thoroughly tested coating formulations, the glass industry could suffer, as inadequate paint products may fail at an erratic rate by way of flaking, cracking and peeling. Also, novel paint chemistries applied to glass aren't tested for durability, which means household cleaners and general interaction could damage or remove the paint.

As these untested paints have the potential to build harmful industry-wide reputations, architects may deviate and specify alternative non-glass elements, and contractors may inflate cost to offset risk, which may

When design specifics call for...	Consider using test method...	This standard determines...
How well the paint adheres		
adhesion of a paint over time	ANSI Z97.1, Section 5.3.2 (Boil Test, 1)	Different and unpredictable environmental conditions can affect the paint and its adhesion. Passing the boil test is a good indicator that the adhesion is robust.
requiring a paint to support the load of the glass	ASTM D5179 Measuring Adhesion of Organic Coatings in the Laboratory by Direct Tensile Method	adhesion of the paint and the ability of the paint to support the load
an organic paint to have a minimum film hardness	ASTM D3363 Standard Test Method for Film Hardness by Pencil Test	This test can be performed in a laboratory or in the field to quantify the film hardness of the cured paint.
the painted glass surface to be exposed to blunt force or other physical contact in application	ASTM D2197 Standard Test Method for Adhesion of Organic Coatings by Scrape Adhesion	the adhesion of paints when applied to smooth, flat panel surfaces. Paints, to perform satisfactorily, must adhere to the substrates on which they are applied.
Mounting strength		
quickly determining adhesion of a coating to substrate, or to check compatibility of a coating	ASTM D3359 Standard Test Method for Rating Adhesion by Tape Test	adhesion of coating films to substrates by applying and removing pressure-sensitive tape over cuts made in the film.
the ability of the cured sealant to maintain a bond to the substrate under severe peel conditions	ASTM C794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants	adhesion characteristics of sealant/primer combinations with unusual or proprietary substrates and whether the failure mode is primarily adhesive or cohesive.
sealant-based load bearing of decorative glass	ASTM C1401 Standard Guide for Structural Sealant Glazing	safe and proper design and installation of a SSG system utilizing specified testing
Resistance to foreign substances		
the painted glass surface to be exposed to cleaning or other such solvents	ASTM D5402 Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs	how exposure to the solvent would impact the painted surface.
cleaning of or near materials with organic finishes using common cleaning chemicals	ASTM D1308 Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes	a procedure to evaluate the relative alteration of coating systems in resistance to various liquid cleaners
a particular paint water-tolerance	ASTM D870 Standard Practice for Testing Water Resistance of Coatings Using Water Immersion	the extent of degradation due to water permeation based on coating characteristics and water temperature
exposure to daylight through glass	ASTM G24 Standard Practice for Conducting Exposures to Daylight Filtered Through Glass	used to determine physical and appearance changes that may occur due to such exposure

GLASS INFORMATIONAL BULLETIN—BEST PRACTICES FOR INSTALLED PAINTED DECORATIVE GLASS

lead to the overall reduction of specified coated glass, and perhaps glass itself in decorative applications.

Professionally formulated coatings made by chemists with glass application in mind are thoroughly tested to prove a chemical bond exists, meaning it can avoid adhesion and durability failures when installed in the field.

Elements of adhesion and installation

When evaluating a painted glass product, the installation materials and substrate play a vital role in the success of the product. The resulting composite product has forces working at every adhesion interface as well as on the materials themselves.

Gravity

Gravity is always acting on the glazing during and after the installation. Elements behind the glass, including the paint, adhesives, mechanical fasteners, and the substrate itself are holding the weight of the glass in the air. The total mass of the glazing is not insignificant, putting a static shear force on each component. Consider the following questions at a minimum:

- For structurally glazed installations using direct adhesion with silicone or mastic, can the strength of the silicone or mastic withstand the weight of the panel? Is there sufficient adhesive strength between the back-painted glass surface and the silicone or mastic?
- For mechanically fastened installations, does the substrate have sufficient mechanical properties to support the fasteners?

- Do the adhesives, including tapes or cured sealant, have the cohesive strength to hold the weight?

Building shifting and settling

Even interior installations are affected by the movement of the building. Winds can cause taller buildings to sway. Newer buildings can sink into their foundation. The interior surfaces that hold the painted glazing can move along with the building. Some may put pressure on the system through twisting or skewing.

Consider the following questions:

- Can the installation method absorb these forces without sacrificing the integrity of the installation?
- Can the installation system handle cyclical changes like expansion and contraction due to temperature changes?

Uneven surfaces

While every trade does its best to ensure a quality installation, glazing may end up installed on a bowed or uneven substrate. These installations can sometimes cause a material which is flat by nature to conform to an unnatural shape. The deflection in the glass will be applying a force to itself, trying to straighten back out. This force can add a peel force to every component in the installation.

Uneven surfaces may force installation hardware or adhesives not to be applied as intended. Potential shimming or adhesive thickness variances may alter their strength. Installation design should take these variances into account.

Other dynamic forces

After the installation of the glazing, it may be subject to different temperatures,

humidity changes, chemical exposure, and irregular forces. Some forethought into what types of extra durability might be required will reduce the risk of failure of the installation. The performance of materials is specified in their ideal state with some allowance for aging. If an element is compromised, the performance may decline, and calculated values will no longer be accurate.

Testing

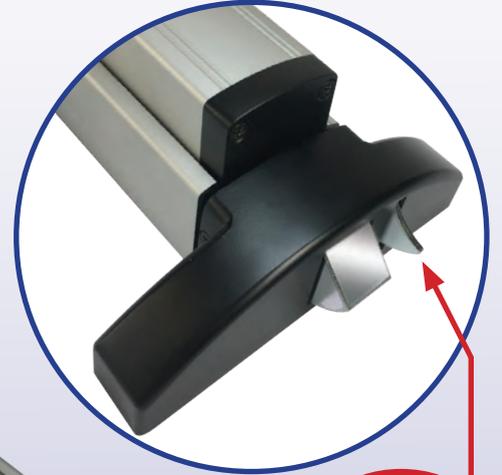
Strength, adhesion, resistance to solar radiation, water, and chemicals, and compatibility of materials typically used in the installation of painted decorative glass are important considerations. It is best practice to make use of the right tests for the right application. Glass subject to harsh chemical cleaning due to the environment where it is installed may require different testing than glass mounted in a high-humidity location. Glass with exposed edges and accessible backside where cleaning or other materials could accumulate or drip should be treated differently from glass adhered to a wall with sealed joints.

Many practical tests are available that help provide a level of assurance that the painted decorative glass will be fit for its intended use. Choose the tests that fit the environment and mounting configuration to give best results for installed painted decorative glass and minimize risk going forward. ■

8660, 8760 & 8860 Inset Push Bar

Field Sizable from 48" to 36"!

NEW!



8760
Optional
Heavy Duty
Deadlatch

Adaptable Security

Our inset push bar family is field sizable from 48" all the way down to 36". No Pinch or Jamb points. No visible fasteners on the backside makes for a sleek and elegant look.

8660
Concealed
Vertical Rod
Exit Device

8760
Rim Latching
Exit Device

8860
Mortise Latching
Exit Device

Find Out More



For pricing and availability contact
(800) 793-4544
www.FCBP.com
sales@FCBP.com

First Choice Building Products Stocking Partners

Aroyan Inc.
www.Aroyaninc.com
781-421-3107

JLM Wholesale
www.JLMWholesale.com
quotes@JLMWholesale.com
800-522-2940

Security Lock Distributors
www.SECLock.com
800-847-5625



SEE WHAT
GLASS
CAN DO
GGI

TAKE GLASSBOARDS TO THE MAX™

Max™ Glassboards are multi-functional and highly customizable solutions designed to encourage collaborative experiences. Contact us today to learn how GGI can support your visual display needs.

 800-431-2042  sales@generalglass.com  generalglass.com

BE INSPIRED >>

The most clicked news stories on GlassMagazine.com, brought to you by **GLASS MAGAZINE WEEKLY***

JE Berkowitz, Solar Seal, CCBP Face Uncertain Future

In early February, Consolidated Glass Holdings Inc. paused operations and furloughed employees at Pedricktown, New Jersey-based J.E. Berkowitz. The fabricator has 200 employees. CGH also plans to close Columbia Commercial Building Products, a glass and glazing fabricator in Rockwall, Texas, with about 60 employees.

In a statement, company leadership said the ongoing COVID-19 pandemic led to the current stoppage at J.E. Berkowitz. “The delays that initially came with the onset of COVID-19 took a significant toll,” CGH officials said. “Furthermore,



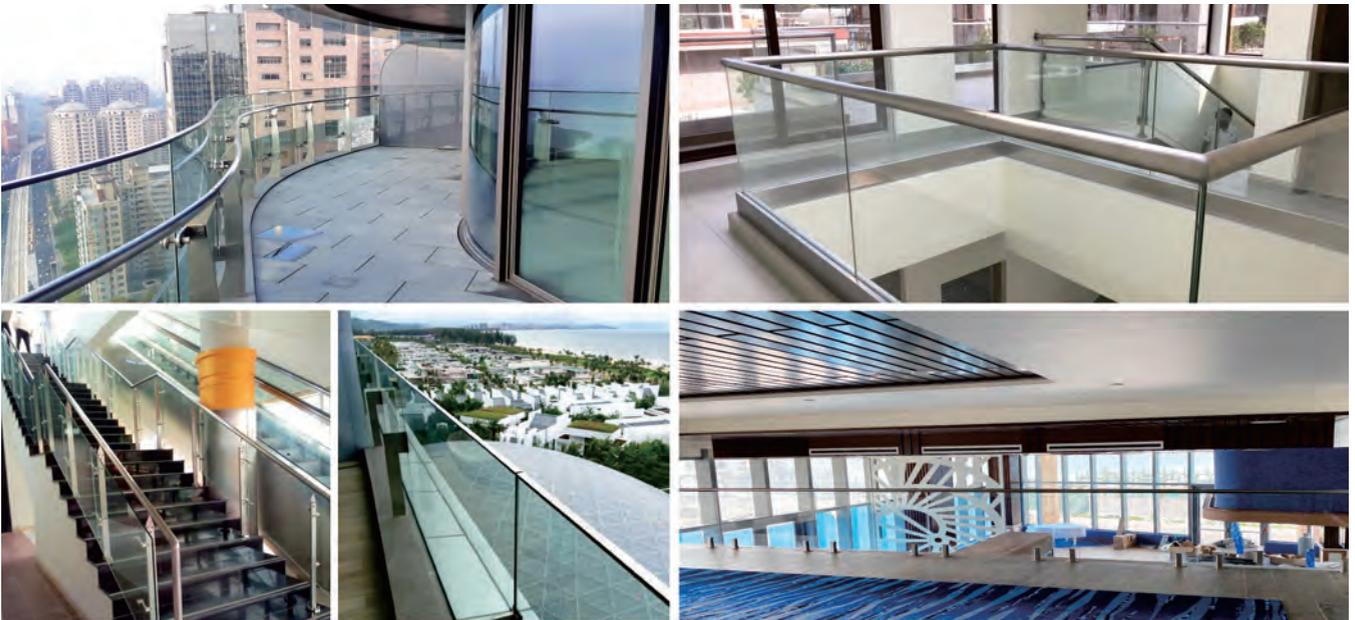
SIGN UP

Not getting Glass Magazine Weekly, formerly e-glass weekly, every Tuesday? Subscriptions are available at GlassMagazine.com under the “Subscribe” tab.

disruptions to the workforce as a result of the pandemic were substantial, leading CGH to decide to suspend manufacturing operations at JEB.”

In Texas, “Columbia Commercial Building Products is winding down operations primarily due to the lease at its Rockwall, Texas, facility,” officials said. “With a lease terminating and the cost of moving high-end glass fabrication equipment looming, CGH decided it was prudent to complete its remaining pipeline and subsequently liquidate the operation unless a buyer can be found.”

J.E. Berkowitz and CCBP are part of CGH’s architectural division, which also includes Solar Seal, an architectural



GLASS RAILING SYSTEM

KIN LONG
For Better Living

INTEGRATED EXPERTS ON CONSTRUCTION HARDWARE SOLUTIONS
Stock Code : 002791 www.kinlong.com Contact : mail@kinlong.com

glass fabricator based in South Easton, Massachusetts, with 125 employees. While Solar Seal is currently operating, the company filed for the WARN Act, which provides a 60-day notice to employees of a potential plant closing. “We are hopeful that conditions will improve and that we will be able to revise our outlook and continue operations at Solar Seal,” CGH officials said.

CGH also operates a security division, SSI, which includes Dlubak Specialty Glass and Global Security Glazing, both of which remain “open and operating at full strength,” according to company officials. For updates on this unfolding story, visit GlassMagazine.com.

Xinyi Glass to Buy China Glass

Xinyi Glass plans to acquire all of China Glass’s issued shares, according to Hong Kong-based newspaper, The Standard. The total value of the shares is \$215 million. The company will remain listed as China Glass, and will continue to be traded on the stock exchange, according to reporting.

Syracuse Glass Partners with Lineage Capital

Syracuse Glass Co. and Lineage Capital formed a partnership. The Dwyer family will retain a significant ownership stake in Syracuse Glass, and John Dwyer will continue to serve as CEO/president and chairman of the board of directors.

Founded in 2003, Lineage is a Boston-based private equity firm that invests exclusively in owner-managed and family-controlled businesses in the middle market. According to the company, Lineage’s partnership approach allows owners to realize current value in their business today and gain a value-added financial partner to help facilitate their company’s future growth and success while retaining board control.

View Inc. to Merge with CF Finance Acquisition Corp. II

View Inc., a Silicon Valley-based smart window company, and CF Finance Acquisition Corp. II, a special purpose acquisition company sponsored by Cantor Fitzgerald, entered into a definitive merger agreement. The combined company will be called View Inc. and will be publicly listed on the

NASDAQ market following the close of the transaction.

The board of directors of each of View and CF Finance Acquisition Corp. II unanimously approved the transaction. The transaction will require the approval of the stockholders of CF Finance Acquisition Corp. II and View, and is subject to other customary closing conditions, including the receipt

Azon Saves Energy



Daylighting systems produced with Azon structural thermal barrier technologies—the **MLP™** or **Dual Cavity**—for aluminum windows and curtain wall, along with high performance glazing components for insulating glass, will yield a fenestration system capable of upholding the highest efficiency and sustainability standards

Contact us to learn about the role of Azon thermal barriers in energy conservation.



1-800-788-5942 | www.azonintl.com

NEWS TO KNOW

of certain regulatory approvals. The transaction is expected to close in the first quarter of 2021.

MI Windows and Doors Acquires Sunrise Windows & Doors

MI Windows and Doors acquired Temperance, Michigan-based vinyl replacement window manufacturer Sunrise Windows & Doors. This is the second acquisition for MI in just over a year; the company acquired Milgard Windows & Doors in November of 2019.

The acquisition aligns with MI's strategy to expand its presence in currently underserved channels and end markets, according to the company.

NSG Group Factory Installs Transparent Solar Window

NSG Group announced in May 2019 a joint development agreement between its subsidiary, Pilkington North America, and Ubiquitous Energy, a leader in

transparent solar technology, to jointly develop transparent solar windows.

A fully transparent, energy-generating window featuring UE Power, UE's transparent photovoltaic technology was recently installed at the NSG facility in Northwood, Ohio. This building integrated photovoltaic, or BIPV, technology transforms an average window into a solar cell that generates electricity.

Kensington Glass Arts Opens New Virginia Manufacturing Facility

Kensington Glass Arts Inc., a Mid-Atlantic glass manufacturer, commercial glazier and distributor of architectural glass, opened an additional glass fabrication facility in Sterling, Virginia.

The new Sterling facility opened for production in January 2021, following the establishment of processes and procedures to ensure KGa's outstanding quality manufacturing standards. This 20,000-square-foot facility added to

the company's current 30,000-square-foot facility, will help KGa expand its tempered, laminated and tempered laminated glass fabrication capabilities. The new facility will also further support KGa's move into the Richmond, Tidewater, and Shenandoah Valley, Virginia, markets, say officials.

American Bath Group Acquires DreamLine

DreamLine, a provider of glass shower doors, enclosures and accessories under the DreamLine and Arizona Shower Door brands, was acquired by the American Bath Group. DreamLine is headquartered in Warminster, Pennsylvania, and is a portfolio company of MPE Partners. The American Bath Group is a portfolio company of Centerbridge Partners.

Lincoln acted as the exclusive financial advisor to DreamLine and MPE Partners, working closely with the management team and shareholders throughout the sale process. This included providing advisory expertise and managing the preparatory, marketing, due diligence and negotiation phases of the transaction. Terms of the transaction were not disclosed.

AIG Upgrades Baltimore Facility to Expand Capabilities in Northeast

American Insulated Glass is finalizing the rebranding of A.L. Smith Glass in Ijamsville, Maryland, which is located just west of Baltimore.

The rebranding effort, which kicked off last year following the acquisition, includes new signage, a new website, expansions and improvements to the existing fabrication facility, and the installation of a new glass tempering furnace. This completes the transition from what was, prior to the acquisition, a heavily residential glass manufacturer into one with the capacity to address needs in both the residential and commercial markets. ■



- All racks ship fully assembled with step-by-step instructions
- Factory authorized installations available across North America.
- Glass trucks built to order and in-stock for fast delivery.

(844) 364-4022 | MyGlassTruck.com



WE HAVE WHAT YOU NEED

Glass Fabrication Equipment, Tooling & Supplies that
GO BEYOND THE EDGE

Salem is your source for high-quality products – from tooling and supplies such as **Cup Wheels, Core Drills** and **Peripheral Wheels** to material handling equipment like **Dual-Belt Seamers, Vacuum Lifters** and **Carts and Racks**.

We meet your needs with the **Salem Advantage:**

- Unmatched Service
- Innovative Solutions
- Total Ownership

Contact Us Today
for more information



800.234.1982 | info@salemftg.com | www.SalemFTG.com

Salem Fabrication Supplies is a division of Salem Fabrication Technologies Group, Inc. | We Are 100% Employee Owned

INSIGHTS

- 20. CLOSER LOOK
- 23. VIEWPOINT
- 26. CODE WATCH
- 29. PERFORMANCE MATTERS



CLOSER LOOK

GET TO KNOW LIZ HAGGERTY

The new president of OBE brings a mix of technical acumen and business expertise to North America's largest glass and metals company **BY KATY DEVLIN**

Liz Haggerty is a self-described tinkerer. Even as a young person, she expressed a mechanical curiosity that led her to take on the role of household fixer. “My father was in the Navy and often away, and my mother was not the most mechanical person. If something broke around the house, I would fix it,” Haggerty recalls. “When the water pump broke on the water heater, I figured out how it worked to see if we could fix it. Even now, I’m still the mechanically driven person in the household.”

Haggerty’s interests drove her to study engineering in college. She received a Bachelor’s in Metallurgical Engineering (the study of metals) from the New Mexico Institute of Mining and Technology before going on to achieve a Master’s in Metallurgical Engineering from the University of Connecticut.

That same mechanical curiosity has carried into her work, first in the HVAC industry and now in glass and glazing at Oldcastle BuildingEnvelope.

Haggerty joined OBE in 2019 as president of the Architectural Glass and Metal division, and she was named president of the company in December 2020. OBE is the largest glass and metals fabricator in North America, with more than \$1 billion in annual sales, 82 locations and more than 6,500 employees. Its portfolio of businesses includes C.R. Laurence, Coral Industries, Holoform and SIGCO.

When Haggerty first joined the company, she worked with her team to assemble a storefront and curtain wall system, gaining a hands-on understanding of the product lines, the components and the assembly process. “I wanted to learn all of the different pieces and understand how they fit together,” she says.

Her engineering background has proven critical to understanding products and “designing and developing products for the needs of the market,” she says.

She sought to “round out” her education with a business degree, completing a Master’s in Business from the University of Connecticut just three years after she received her Master’s in Engineering. “The engineering piece creates a process-driven mindset. I purposely got an MBA to round that out and gain a better understanding of other components—organization, capacity building,” she says.

HVAC v. glass

The balance of business and technical expertise, and intellectual curiosity, has aided Haggerty’s introduction into a new industry. She joined the glass industry following 30

years of leadership in the HVAC industry. Prior to coming to Oldcastle BuildingEnvelope, she held the role of vice president and general manager of Global Ducted Systems for Johnson Controls, where she was responsible for leading the design, manufacturing and sales of all JCI residential ducted and commercial rooftop products globally.

She has also served as regional president of Carrier Enterprise, a joint venture between Watsco and Carrier (a UTC company), where she led the distribution of residential and light commercial equipment and parts; and has had a 20-year career at Carrier/United Technologies, which included progressive leadership roles across multiple disciplines of the business.

“It’s a big jump to change industries,” says Haggerty. “Glass is a very proud industry. There is longevity in this industry, a long tenure. ... But there are similarities between the two [industries].

The go-to-market is similar. The influencing model is similar. And both industries have very skilled tradesmen who are very focused in their area of expertise.” Both HVAC and the glass/ façade industry are also integral to the ongoing conversations around building energy footprint, she says.

COVID pivot

Adding to the challenge of learning a new industry, Haggerty also faced the challenges of COVID only several months into her tenure at OBE.

The company pivoted to develop a new range of products for the immediate needs of the market, including SecureOne Screen and SecureOne Test modular glass systems that provide physical, protective barriers between the public and workers who are conducting testing or screening.

On the operations front, OBE suspended international and domestic

travel and face-to-face meetings, and implemented new workplace health and safety policies. The company adopted technology in new ways to safeguard employees, including virtual meetings and incorporating hands-free applications for hourly workers to clock in. OBE began to utilize its SecureOne Screen across all glass manufacturing plants to pre-screen employees with relevant COVID-19 exposure questions and temperature checks. The company also assembled a team of leaders focused on an internal business continuity plan to address both short- and long-term issues that could surface from the pandemic.

“There was less certainty in the beginning—so much we didn’t know,” Haggerty says. “Our main concerns were: How do we protect employees? What does it mean to be an essential business?”

TOUCHLESS DOOR HARDWARE TO ENSURE SAFETY AND SECURITY

JLM Wholesale stocks multiple touchless door hardware options from leading manufacturers. We can assist you in finding the best solution for hands-free entry and exit.



MI | 800.522.2940
NC | 800.768.6050
TX | 877.347.5117

423.JLM.HELP
704.509.2940
www.jlmwholesale.com



Market trends

After the immediate COVID pivots, Haggerty shifted her focus to wide-scale pandemic-related market trends that might affect the design industry and the products that OBE will need to supply to meet customer demands. Some trends she is watching: more digitalization, more modularization and a demand for a reduction in workforce at the jobsite. “How can we do a better job together to simplify the process as a value chain? How can we respond to needs for a reduction of labor on the worksite?” she asks.

Haggerty is also seeing a new focus on remodeling and retrofit. “People are looking at their space differently,” she says. “We’re seeing shifts in building design and building utilization.” Hospitality and hotels may be transitioned into residential spaces. Office environments will be adapted to

meet new health and safety demands.

She anticipates a contraction in the overall nonresidential construction market in 2021 and 2022. Her focus is finding the opportunities for growth within specific segments. “I am looking at what we can do to make sure we have the right products and processes for businesses [in the segments] where they are growing,” she says.

COVID-19 has changed consumer behavior, and it has changed the way occupants use and interact in buildings, she describes. “What happens to retail space? What does it mean for grocery, which continues to grow, health care, which continues to grow, urgent care and pharmacies? COVID has impacted what the commercial building market might look like. ... Understanding what’s happening in the broader segment categories is important, so we can

make sure we’re pivoting in the right direction,” she says.

Looking ahead at OBE

In the announcement of Haggerty’s new role, Nathan Creech, former OBE president and current CRH president of commercial building products, referenced OBE’s “next phase of growth.” Haggerty says this growth will focus on optimizing OBE’s position across its three businesses—glass, architectural glazing and hardware—and better integrating those businesses.

“We have to leverage the power across the three divisions. We can provide everything needed for a job, from glass to glazing to hardware,” she says. “How can we give the divisions the ability to grow and execute in the market? ... We will be upgrading our operating systems and giving our divisions the ability to have much more connectivity.” ■

A World of GLASS

DEPENDABLE
Glass Works

800-338-2414

COMMERCIAL & RESIDENTIAL
glass and mirror fabrication
specializing in CUSTOM PROJECTS

Our fabrication services include

Tempered Glass - sizes 6" x 6" up to 60" x 120"
thicknesses 1/8" up to 3/4"

Tempered Laminated Handrails

Glass Stair Treads & Flooring

Laminated Glass

Custom Interlayered Glass

Insulated Glass

Impact Resistant Glass

Counter Tops /Table Tops /Shelving

Textured Glass

Antique Mirrors

Decorative Art Glass

Beveled Glass and Edgework

The FOXWORTH FAMILY has been servicing
residential and architectural glass customers for
OVER 56 YEARS. Call us today!

Toll Free: 800-338-2414 Local: (985)892-0999

3 Fabrication plants in
Covington, LA



TAKE FIVE WITH RANDY STEINBERG

Glasswerks owner discusses his 47 years of glass in Southern California

BY MAX PERILSTEIN



Randy Steinberg, owner of Glasswerks in Southgate, California, started in the glass and glazing industry in 1974, when he was 14 years old. Working at a small glass shop in Los Angeles, he did a little bit of everything, sweeping floors and learning how to cut, handle and install glass. Within five years, he was owner of the shop, and a few years after that, he launched Glasswerks.

In the decades that have followed, Steinberg's journey has included nearly a dozen acquisitions, the sale and eventual buyback of Glasswerks, and the launch and sale of a new company. Steinberg has been making his mark on the glass industry running a high-performance glass fabricator that, today, includes nine tempering furnaces, three bent tempering furnaces, eight insulating lines, four jumbo laminating lines, more than 100 pieces of automated fabrication machinery and more. Glasswerks can cater to everything from a skyscraper or stadium to a single order for one piece of tempered glass.

I've known Steinberg for about 30 years. He doesn't often appear in the spotlight. He prefers to be in his plant, working with the team. However, to recognize his 40+ years in the industry, I visited with Steinberg, joined by Dan Pompeo, a longtime Glasswerks sales representative at Architectural Glazing Solutions, to get a rare on-the-record interview, discussing everything from his start in the industry to the Los Angeles Riots to the ongoing pandemic.

Visit glassmagazine.com for more photos from the Glasswerks history.

TIMELINE

1974

14-year-old Steinberg starts work at Triepke Glass.

1979

At 19, he purchases Triepke Glass.

1983

He launches Glasswerks as an opportunity to get into glass fabrication.

1983-1999

Glasswerks expands through acquisition and new locations, including: Tempwerks in Vernon, California; QuickTemp in Los Angeles; Tyre Bros Glass in Los Angeles; SD Glass Fab Glass Co. in Oceanside,

California; Lab Glass in Phoenix; Interstate Glass in Union City, California; Hygrade Glass in Lodi, California; Campbell Glass Shop in Los Angeles; Custom Glass in Los Angeles; and Glasswerks Las Vegas.

1999

The Glasswerks Group, including all locations, is sold to United Glass Co. Steinberg continues to operate the company and is on the UGC board of directors.

2001

Steinberg purchases back a portion of the Glasswerks Group of Companies, including Tempwerks

and the Glasswerks locations in Los Angeles, Phoenix and Oceanside, California.

2001-2007

Glasswerks acquires Avalon Glass & Mirror in Carson, California, and Wurzell Mirror Manufacturing.

2006

Steinberg starts Catalina Tempering.

2005-2014

Catalina Tempering grows to include locations in: Adel, Georgia; Easton, Pennsylvania; Irving, Texas [two locations]; Los Angeles; Mount Airy, North

Let's start at the beginning. How did this all begin—your life in the glass industry?

When I was 14, I started at Triepke Glass [in Los Angeles]. I just wanted to make money. They paid me \$3 an hour. I did whatever I had to do there. I dropped out of high school in 11th grade to go full-time there, and by the time I was [about] 20 I bought it. From there it just led to Glasswerks and a lot of companies and moves along the way.

One of those moves was selling Glasswerks to United Glass Co. and then buying it back. Can you talk about that time?

We came out a lot better on the other side [of that deal]. We got the right value [for the business during the sale]. We held out, and so we had a lot of stock. They wanted to sell back to us, because they didn't want to be on the West Coast. We were able to buy it back then at a great deal.

The concept [at United Glass Co.]

was good, [bringing many companies together]. But we had too many business entrepreneurs who ran their own businesses. We just couldn't get the thing going right.

In 1992, Glasswerks was located right in the area affected by the Los Angeles Riots. What do you remember about that time?

The riots happened outside of our location. Everything around us burned, but our building was spared. We had built a block building with tall walls and no windows except bulletproof windows in the front, so you couldn't throw a Molotov cocktail through. So [our location] survived the riots.

That was also the day that we were moving our factory to a new location. We ended up having to stop and store everything. In fact, the other location where we were moving was also caught up in the riots. It was initially set on fire, but we had a guy living there who was able to put it out.

Fast forward to today, and we're in a time dominated by COVID-19. How have you managed during the pandemic at Glasswerks?

We've been, since day one, very strict on [COVID protocols] about wearing PPE, the masks, gloves, [using] hand sanitizer. We have a lot of signage in the shop about wearing the mask ... and we are hard on it. We've been very fortunate and haven't had a lot of COVID cases.

You've been in the industry now for 47 years. What is your main approach each day?

I always look forward. I never look back. I can't do anything about the past. All I can do is make the future better. ■

Max Perilstein is founder of Sole Source Consultants, a consulting firm for the building products industry that specializes in marketing, branding, communication strategy and overall reputation management, as well as website and social media, and codes and specifications.

Carolina; and Utica, Ohio.

2014

Catalina Tempering is sold to Cardinal Glass

2021

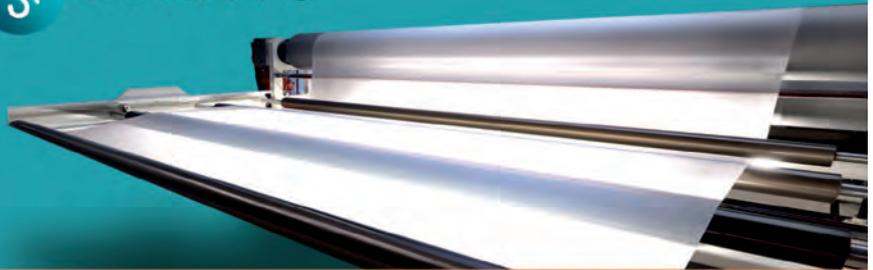
Glasswerks operates several businesses, including: Glasswerks LA; Glasswerks Temecula; Glasswerks Architectural; Glasswerks Jumbo; Glasswerks Rheem Insulating; and the former Northwestern Industries Yuma, Arizona, acquired in 2020.



Left: Glasswerks in 1992, with debris from the Los Angeles riots. Below: The Glasswerks factory floor in the 1990s.



EVA film



Glass Machinery

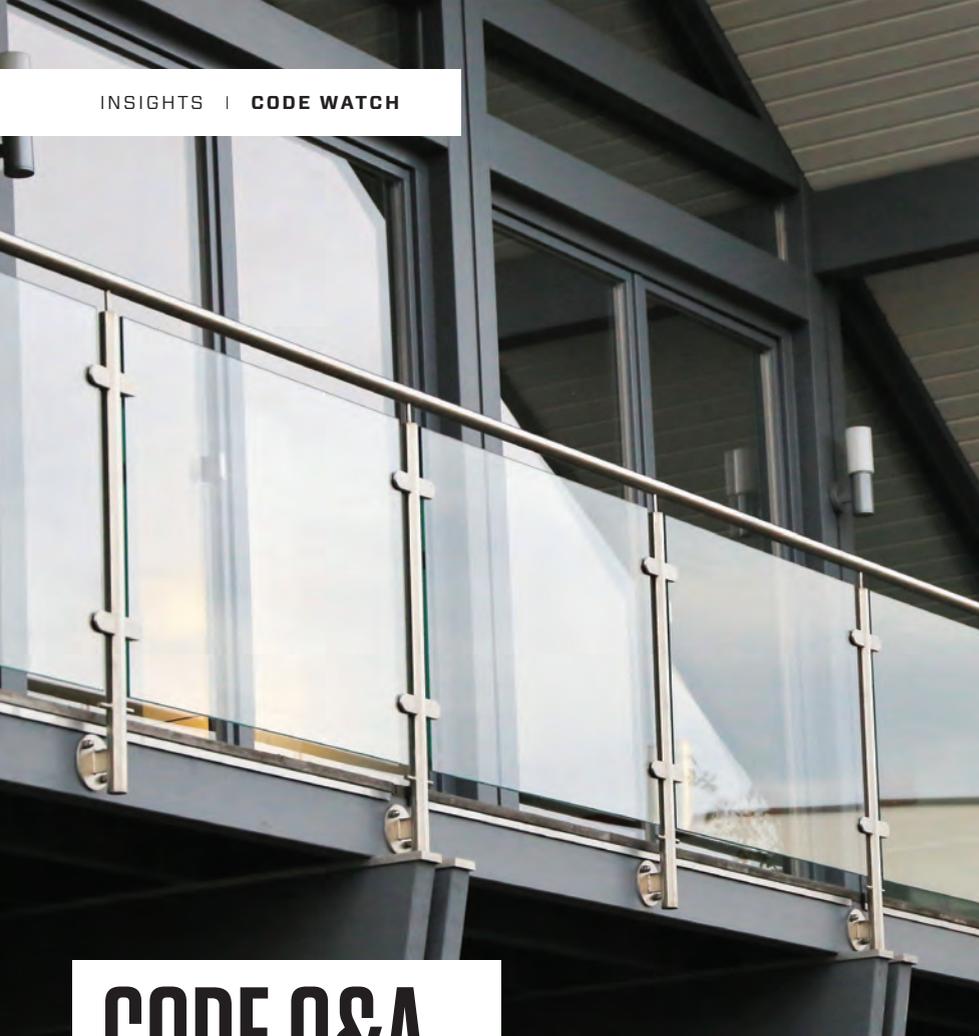


www.satinal.it | info@satinal.it

SATINAL



Glass Machinery & EVA Film Manufacturer



CODE Q&A

Understanding the requirements for glass railings and guards

BY THOM ZAREMBA



The requirements for glass railings and guards have evolved over the past several building code cycles, and the 2021 International Building Code further clarifies the requirements with defined terms. Use the following FAQ to navigate the changing requirements as states and local jurisdictions adopt new versions of the model code.

How does the building code define railings and glass guards?

While the term “railing” is used throughout the code, it is not defined in the building code. Instead, the IBC defines the term “guard.” A guard is defined in Section 202 as a building component or system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level. ASTM E2353 Standard Test Methods for Performance of Glass in Permanent Glass Railing Systems, Guards & Balustrades defines guardrail similarly.

Other related terms to understand and differentiate include:

- Handrail, defined in Section 202 of the IBC as a horizontal or sloping rail intended for grasping by the hand for

guidance or support (2018/2021 IBC 2407).

- Baluster, while not specifically defined in the code, is typically understood to be a structural or load-bearing vertical panel in a guard system, such as a lite of glass.
- Infill panel, likewise, is not defined in the IBC, but is typically understood to be a non-load-bearing panel of material, such as a lite of glass, that occupies the space between supporting structural members of a guard system.

Do glass guards have to be laminated? If so, are there any exceptions to that rule?

Starting in the 2015 code, all glass used in guards and handrails must be:

- Laminated
- Either fully tempered or heat-strengthened
- Able to meet the safety glazing requirements of either Cat. I (16 C.F.R. 1201) or Class A (ANSI Z97.1).

In addition to protecting people from falling from one level to a lower level in a building, the code also intends to protect occupants from the potential risk of broken glass falling from guards located above walking surfaces. Accordingly, Section 2406.4.4 makes it clear that all glazing used in guards, “regardless of area or height above a walking surface shall be considered to be a hazardous location.” While this provision alone would permit the use of any approved “safety glazing,” Section 2407 imposes additional restrictions on the use of glass guards, thus requiring laminated and either fully tempered or heat-strengthened safety glazing.

The only exception to this requirement is where there is either no walking surface below them or any walkway below is permanently protected from the risk of falling glass. Where this exception applies, guards may use fully-tempered, non-laminated glass if it meets the safety glazing requirements of Cat. II (16 C.F.R. 1201) or Class A (ANSI Z97.1)

In all cases, the glass used in guards must have a minimum thickness of 1/4 inch.

When is a top rail required?

A top, or cap, rail is required for glass baluster panels. In these type of guards, the glass is structural or load-bearing. The code requires these types of installations to include a top rail which must be attached to at least three glass balusters. This is intended to ensure that, should one of the glass baluster panels fail, the top rail will remain in place across the resulting opening.

Only one exception to this requirement exists: if the glass baluster is laminated and has been tested to remain in place as a barrier after impact or breakage in accordance with ASTM 2353, then a cap or top rail is not required. Refer to NGA Use of Laminated Glass in Glass Railing Systems for more

details. For versions of IBC prior to 2018, the building code official was required to issue a variance to permit a glass baluster without a top rail.

Note, top rails are not required for infill panels, where the glass is in a non-load-bearing position supported by fixed structural metal posts or rails.

What test standards are required to prove the glass is suitable for glass guards?

To qualify as safety glazing, the glass must be tested to and meet the acceptance criteria, including impact tests, of Consumer Product Safety Commission 16 CFR Part 1201 Safety Standard for Architectural Glazing Materials or ANSI Z97.1 Standard Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test. The glass supplier is responsible for testing and labeling

the product.

Glass railing system testing is done according to ASTM E2353 Standard Test Methods for Performance of Glass in Permanent Glass Railing Systems, Guards & Balustrades. The standard evaluates static strength, impact resistance, and post-break retention. Railing systems are specified according to ASTM E2358 Standard Specification for the Performance of Glass in Permanent Glass Railing Systems, Guards, and Balustrades.

What labeling is required for laminated glass used in railings and guards?

The building code requires glass in guards be permanently marked as safety glazing with the manufacturer's mark, including type and thickness of glass, manufacturer or installer name and the safety glazing standard. For

www.e-bentglass.com

One piece or thousands, our custom fabricated BENT GLASS is bringing form and function to the designs of tomorrow.



Architectural, Interior, Solar & Transport Applications



Precision Glass Bending

THE WORLD LEADER IN
CUSTOM FABRICATED
BENT GLASS

Precision Glass Bending Corporation
PO Box 1970, 3811 Hwy 10 West
Greenwood, AR 72936-1970
UNITED STATES OF AMERICA



Guardian SunGuard Select™ Fabricator



TEL (800) 543-8796 • FAX (800) 543-8798 • sales@e-bentglass.com

laminated glass, the building code official may approve a certificate or other evidence in lieu of a permanent label (refer to 2018/2021 IBC Section 2403.1 Identification and Section 2406.3 Identification of safety glazing). NGA Glass Technical Paper FB11-06 (2020) Marking and Labeling of Architectural Laminated Glass explains the requirements in more detail.

How do I calculate the design load, including the factor of safety, for glass guards?

Glass guards must be designed to meet two separate load requirements: a linear load of 50 pounds per linear foot and a concentrated load of 200 pounds (2018/2021 IBC Section 1607.8). In addition, glass used in guards must be designed using a factor of safety of four (2018/2021 IBC Section 2407.1.1). Compliance with this safety factor can be determined by dividing the traditional glass strength values by four.

Glass strength values are published for the glass industry in NGA Glass Technical Paper FM05-12 Physical and Mechanical Properties of Typical Soda Lime Float Glass.

The safety factor of four applies only to the glass, not to the other non-glass materials in the guard system, such as metal structural posts or rails.

What standards apply for a glass balcony guard in high-velocity hurricane zone regions such as in Miami?

In high windload areas, the building code intends to prevent exterior glass guards from becoming windborne debris missiles. 2018/2021 IBC Section 2404.1 Windloads in Vertical Glazing Applications requires laminated glass in guards. Additionally, if the top rail is attached to any other glass in the guard, the other glass must meet the windborne debris requirements in 2018/2021 IBC Section Windloads.

How wind interacts with the glass guard depends on the design, which could range from narrow glass columns to wide infill panels with high surface area. Wider panels could result in a large positive pressure pushing the glass toward the building and simultaneous negative loads pulling the glass toward the building. Consult with a qualified design professional for specific installations. ■

Thom Zaremba is a partner at Roetzel & Andress and code consultant for the National Glass Association and its Glazing Industry Code Committee.

GI
GROVES INCORPORATED

STRONGER. SAFER. SMARTER.

SIX WHEELED FABRICATION CART
THE SMARTER 0-TURN SOLUTION FOR GLASS HANDLING

WWW.GROVES.COM | SALES@GROVES.COM | 800.991.2120



KEEPING COST AND DURABILITY IN MIND IN THE PURSUIT OF SUSTAINABILITY

BY JOE ERB



Sustainability has been on my mind recently. Between conversations I've had with customers and some potential change coming with the new presidential administration, I expect we'll be talking a lot about sustainable commercial buildings in 2021 and in the coming next few years.

Consider a few converging forces: President Biden's agenda includes significant investment in sustainability initiatives, including the goals of constructing 1.5 million sustainable homes and housing units and better weatherizing 2 million homes within four years. The plan is similar to the American

Institute of Architects' "Blueprint for Better" plan, which sets the target of attaining net-zero carbon dioxide emissions from buildings within the next two decades.

Meanwhile, independent of these developments, I've heard increasing industry chatter about the Passive House standard in the multifamily and commercial space. The building efficiency that can be realized by applying the certification's principles has evolved from niche to mainstream and is being pursued by more and more developers.

Commercial glass and glazing play a critical role in many of these goals, and the ever-present challenge of achieving high performance in a cost-effective manner is something our industry will have to contend with. In addition, holistic sustainability is about more than just thermal efficiency—it's about performance that can be trusted for the long term, without failure and the need for costly replacement.

Affordable sustainability

While highly efficient products are often associated with high costs, consider that Passive House specifically has been steadily growing in an area one might not at first expect: affordable housing.

An instructive example is found in the Belfield Townhomes in Philadelphia, a complex of row houses for residents with low incomes. Completed in 2012, it was the first certified Passive House project in the city, and its success helped ignite a growing trend of highly efficient, affordable housing construction.

By dramatically reducing utility costs via Passive House principles, the building can remain affordable for the long term. It is a sound investment in the Philadelphia community that

Above: BaseCamp Lyngby in Copenhagen demonstrates a mix of high performance and sustainable design. Photo by Kontraframe.

THE BOTTOM LINE: AS A CONFLUENCE OF FORCES HAS MADE HOLISTIC SUSTAINABILITY A PRIORITY FOR NEW COMMERCIAL CONSTRUCTION, ARCHITECTS NEED TO BALANCE COST AND LONG-TERM DURABILITY OF SPECIFIED COMPONENTS TO MAKE IT A REALITY.

is set to serve generations of families over the coming decades. Architect magazine describes how the project stayed within its budget by using a simplified building envelope, modular construction and the specification of economical interior finishes.

More recently, East Harlem’s Sendero Verde, the largest Passive House project in the United States, completed phase one of construction in late 2020. When completed, the 360-unit affordable housing complex will feature triple-glazed windows, mechanically ventilated spaces with energy recovery, and other highly efficient technologies to ensure low cost of operation for the long term.

Projects like these demonstrate that creating highly efficient, sustainable structures can be accomplished without astronomical budgets. Specifying high-performance products where they can have the greatest impact—including

a building’s glass and glazing—can contribute to the highest levels of sustainability and long-lasting cost-effectiveness.

Longevity through durable technology

In creating sustainable buildings, our industry also needs to be considering technology that is not just thermally efficient but can deliver that performance over an extended life expectancy of the product. Key factors include high-performance products, optimized manufacturing techniques with minimal touchpoints, and proper field installation for long-term, sustainable building design.

Longevity is critical to holistic sustainability. Restoring a failed or malfunctioning component of the building envelope fundamentally involves more raw materials and manpower associated with

manufacturing and installing the replacement product. This is a detriment to the overarching sustainability effort—a failed product is simply a waste of resources, and we need to be doing what we can to avoid such a situation.

There’s the economic side to this, too. No architect or developer wants a critical part of their project to fail prematurely, nor the warranty and replacement costs that would come with it. None of which is to mention the reputation damage that comes with a failure.

Seeking and specifying reliable, proven, high-performance glass and glazing products is the answer to each of these problems. Achieving new heights in sustainability relies upon it, and it behooves all stakeholders in our industry to continue collaborating to find the most suitable solutions. ■

Joe Erb is a commercial sales specialist at Quanex Building Products.

Glasshape®

Delivering Bent Glass with Excellence

BENT GLASS SOLUTIONS

Digital Site Measures for Bent Glass Projects

Client: HDI Railing Systems
Project: Lee Health – Estero FL
Photo: Jim Roof Creative

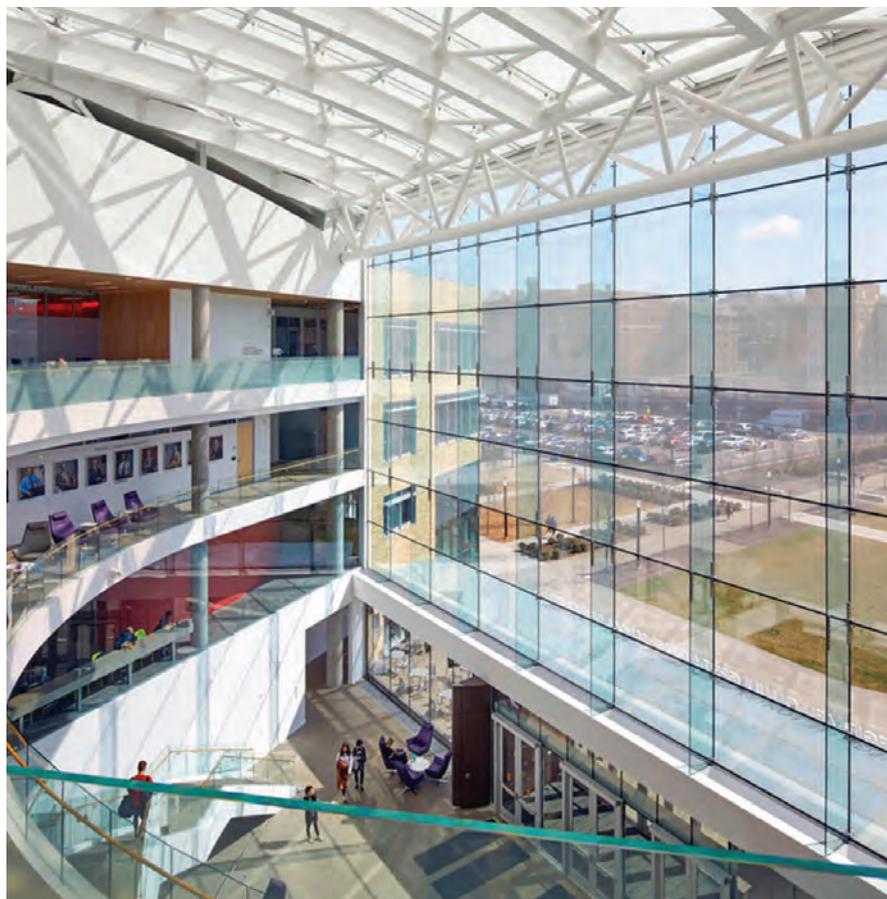
Seattle : 206 538 5416
New York : 332 255 6319

🌐 : glasshape.com ✉ : info@glasshape.com

GREAT GLAZING: TEPPER QUAD AT CARNEGIE MELLON UNIVERSITY

The basics: An impressive structural glass wall highlights the new David A. Tepper Quadrangle, or Tepper Quad, at Carnegie Mellon University. The architect's initial plan for the construction of Tepper Quad, home to the Tepper School of Business, was to use two free-span vertical steel trusses and horizontal steel beams with stainless steel tension rods connected to the front to help support the weight and transfer wind load deflection. But, engineers at the glazing designer W&W Glass advised that transparent fins could be used, both removing visual interruptions from the surface and helping to reduce costs.

"The lynchpin position this building occupies at the Quadrangle in the broader CMU called for a landmark architectural feature, and the wall of structural glazing completely delivers this, while also helping to create a stunning interior space for collaboration," says Chris Lalonde, architectural sales at W&W Glass.



LOCATION
PITTSBURGH

GLASS SUPPLIER
NSG GROUP

ARCHITECT
MOORE RUBLE YUDELL
ARCHITECTS & PLANNERS

The players: Architect, Moore Ruble Yudell Architects & Planners; general contractor, PJ Dick Inc.; glazing design, W&W Glass; installer, D-M Products Inc.; SentryGlas interlayer supplier, Kuraray; structural glass system supplier, NSG Group.

The glass and systems: The atrium features a Pilkington Planar™ vertical atrium glass fin wall and lower glass wall supported on suspended custom, stainless steel blades. The glass fin design is made possible by the strength of the Planar™ | SentryGlas® System laminated glass that was used in the fins, as well as the capabilities of the Pilkington Planar™ 905 series heavy-duty fittings that hold the system in place. The 10-foot by 7-foot 5-inch glass units are made of Pilkington Suncool™ 66/33 T, and the

fittings are heavy-duty stainless steel countersunk bolts, anchoring them to the supporting glass fins.

The installation was completed by using temporary tension cables that simulated the weight each part of the structure would hold, both in terms of the structural glazing and the steel roof beams which support the roof glazing. These tensioned cables were removed one by one throughout the process as the glass was installed so that the position of the supporting structure remained fixed.

"It's another installation that demonstrates that Pilkington Planar™ is the world's leading structural glazing system. It is the quality of the product and the time-tested engineering that backs it up that gives us the confidence to create these ambitious structures," says Lalonde.

WORLD

FABRICATORS PUSH THROUGH UNPREDICTABLE PANDEMIC MARKET WITH NEW MANUFACTURING CHALLENGES
BY NORAH DICK

The challenging 2020 is over, but many hurdles remain in 2021. January data from the Bureau of Labor Statistics registered 140,000 nonfarm payroll jobs lost in December. Construction added 51,000 jobs in the same month, but remains 226,000 below its February level.

Top Glass Fabricators reported major impacts from the pandemic, both financial and operational. Only a little over a quarter of respondents from leading companies reported higher sales in 2020, and many companies noted issues with ensuring workforce safety while also keeping up with demand, all while dealing with the uncertainty of project delays.

The Top Glass Fabricators report provides an important look at the state of glass fabrication in North America, identifying sales trends, market demands and headwinds the segment is facing. The report's industry ranking, the Top Glass Fabricators List, is showcased on pages 34-36.

For a snapshot of leading fabricators' sales and market segment information, see pages 38-40. A breakdown of product and investment trends is detailed on pages 42-43, and find an investigation of this year's major challenges on page 44. For a photo gallery showcasing companies' innovative projects, go to glassmagazine.com.

34	The List
38	Sales & Markets
42	Products & Investment
44	Pandemic Challenges

REARVIEW

THE LIST

SALES CATEGORY (annual sales, in \$)	COMPANY	PLANTS	EMPLOYEES	PRODUCT TYPES
OVER 1 BILLION	Oldcastle BuildingEnvelope* obe.com, Dallas	82	6,500	1 2 3 4 5 6
300-500 MILLION	Tecnoglass Inc. tecnoglass.com, Barranquilla, Atlántico, Colombia	6	5,500+	1 2 3 4 5 6
	Trulite Glass & Aluminum Solutions trulite.com, Peachtree City, Ga.	28	2,500	1 2 3 4 5 6
	Viracon viracon.com, Owatonna, Minn.	3	2,400	1 2 3 4 5
100-300 MILLION	American Insulated Glass aiglass.com, Atlanta	7	600	1 2 3 4 5
	Hartung Glass Industries hartung-glass.com, Tukwila, Wash.	10	800+	1 2 3 4 5
	Prelco Inc. prelco.ca, Rivière-du-Loup, Quebec, Canada	6	650	1 2 3 4 5
	Tvitec System Glass tvitec.com, Cubillos del Sil, Spain	6	500	1 2 3 4 5
	Vitrum Glass Group vitrum.ca, Langley, British Columbia, Canada	2	500	1 2 3 4 5
	50-100 MILLION	Aldora Aluminum & Glass aldoraglass.com, Coral Springs, Fla.	6	425
Basco Manufacturing Co. basco showerdoor.com, Mason, Ohio		3	315	1 3 4
GGI generalglass.com, Secaucus, N.J.		2	200	1 2 4 5

Leading fabricators ranked by 2020 annual sales

As in years past, the Top Glass Fabricators list is composed of leading glass industry fabricating companies, based on 2020 gross sales information submitted by each company. Listed companies include those that fabricate tempered, insulating, laminated and/or decorative glass. Contributing companies are listed alphabetically within a sales category. It is only with the cooperation of the industry that Glass Magazine can compile the most accurate, current industry rankings. If you feel your company belongs on the list, contact Norah Dick, associate editor of Glass Magazine, at ndick@glass.org. Find extensive product and contact information for North American fabricators by purchasing the Fabricator Database, available at worldofglassmap.com.

PRODUCT KEY

1 Tempered 2 Insulating 3 Laminated 4 Decorative 5 Jumbo 6 Metal

SALES CATEGORY (annual sales, in \$)	COMPANY	PLANTS	EMPLOYEES	PRODUCT TYPES
	Glassfab Tempering Services glassfabusa.com, Tracy, Calif.	4	260	1 2 3 4 5
	Glasswerks glasswerks.com, Southgate, Calif.	7	575	1 2 3 4 5
	Tecnovidrio, S.A. De C.V. grupotecnovidrio.com, Mexico City	5	700	1 2 3 4 5
	Tristar Glass tristarglass.com, Catoosa, Okla.	3	225	1 2 3 4 5
30-50 MILLION	Custom Glass Products customglassproductswi.com, Weston, Wisc.	3	200	1 2 3
	Garibaldi Glass Industries Inc. garibaldiglass.com, Burnaby, British Columbia, Canada	1	200	1 2 3 4 5
	Glass and Metal Craft gamcusa.com, Wixom, Mich.	1	140	1 2 3 4 5
	Global Security Glazing security-glazing.com, Selma, Ala.	1	87	1 2 3
	Insulite Glass Co. insuliteglass.com, Olathe, Kans.	2	175	1 2 3 4 5
	J.E. Berkowitz jeberkowitz.com, Pedricktown, N.J.*	1	200	1 2 3 4 5
	*Parent company CGH announced a stoppage in operations last month at JEB.			
	Kensington Glass Arts kensingtonglass.com, Ijamsville, Md.	1	191	1 3

PRODUCT KEY

1 Tempered 2 Insulating 3 Laminated 4 Decorative 5 Jumbo 6 Metal

SALES CATEGORY	COMPANY	PLANTS	EMPLOYEES	PRODUCT TYPES
30 - 50 MILLION	Safti First Fire Rated Glazing Solutions safti.com, Brisbane, Calif.	4	250	1 2 5
	sedak GmbH & Co. KG sedak.com, Gersthofen, Germany	2	200	1 2 3 4 5
	Solar Seal solarseal.com, South Easton, Mass.	1	125	1 2
	Virginia Glass Products va-glass.com, Ridgeway, Va.	2	170	1 3 4
10 - 30 MILLION	Agnora agnora.com, Collingwood, Ontario	1	70	1 2 3 4 5
	Columbia Commercial Building Products ccbwin.com, Rockwall, Texas*	1	58	1 2
	*Parent company CGH announced that CCBP will be winding down its operations.			
	Consolidated Glass Corp. cgcglass.com, New Castle, Pa.	1	75	1 5
	Dlubak Specialty Glass dlubakglass.com, Blairsville, Pa.	1	81	1 2 3 4
	Flat Glass Distributors flatglassdistributors.com, Jacksonville, Fla.	1	70	1 2 4 5
	GlasPro Inc. glas-pro.com, Los Angeles	1	100	1 2 3 4 5
	Glassource glassource.net, Grand Haven, Mich.	1	105	1 4
	Paragon Tempered Glass paragontemperedglass.com, Antwerp, Ohio	2	156	1 2 4 5
	Precision Glass Bending e-bentglass.com, Greenwood, Ark.	1	50	1 2 3
	Skyline Design Inc. skydesign.com, Chicago	1	100	1 3 4
	Splendor Glass Industries splendorshowerdoor.com, Holland, Ohio	1	94	1 3 4
Syracuse Glass Co. syracuseglass.com, Syracuse, N.Y.	1	100	1 2 3	



“FeneVision is continuing to evolve to fit our future needs.”

L.W. Deal,
Virginia Glass Products

Read more about Virginia Glass Products' success at <https://fene.tech/vgp>

 **FeneTech**

25 Celebrating 25 years of excellence

FeneVision is the world's preeminent software provider for the glass fabrication and window & door manufacturing industries

330.995.2830 | info@fenetech.com | fenetech.com

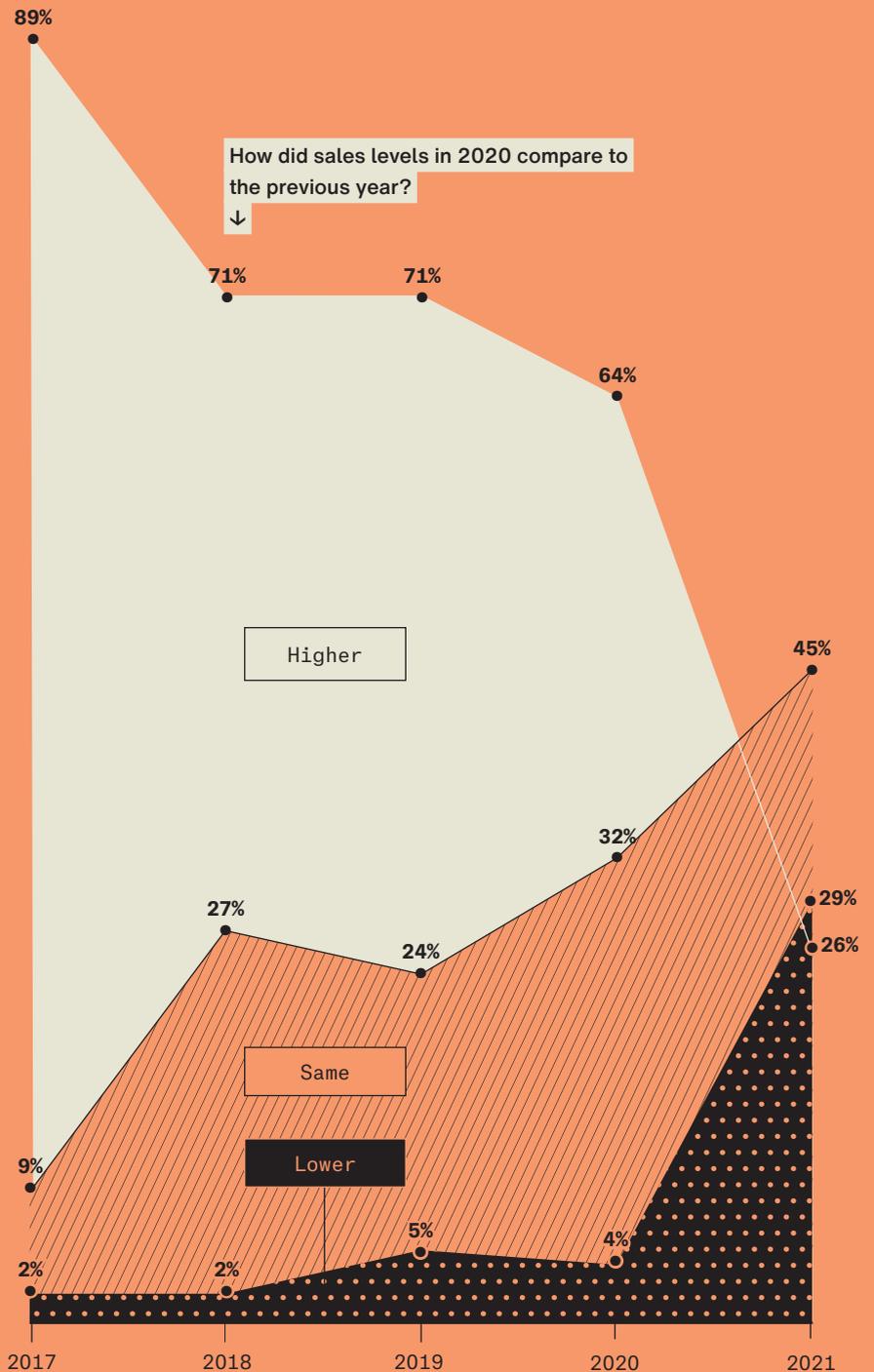
REDUCED SALES GROWTH

Top Glass Fabricators' reported sales numbers reflect the starkly different reality of 2020. In last year's report, only 4 percent of companies reported a year-over-year sales decrease; in contrast, 29 percent of this year's listed fabricators said sales were lower in 2020 compared to the previous year. Only 26 percent of companies, a distinct minority, reported sales increases year-over-year, suggesting the very limited growth of the market during the pandemic.

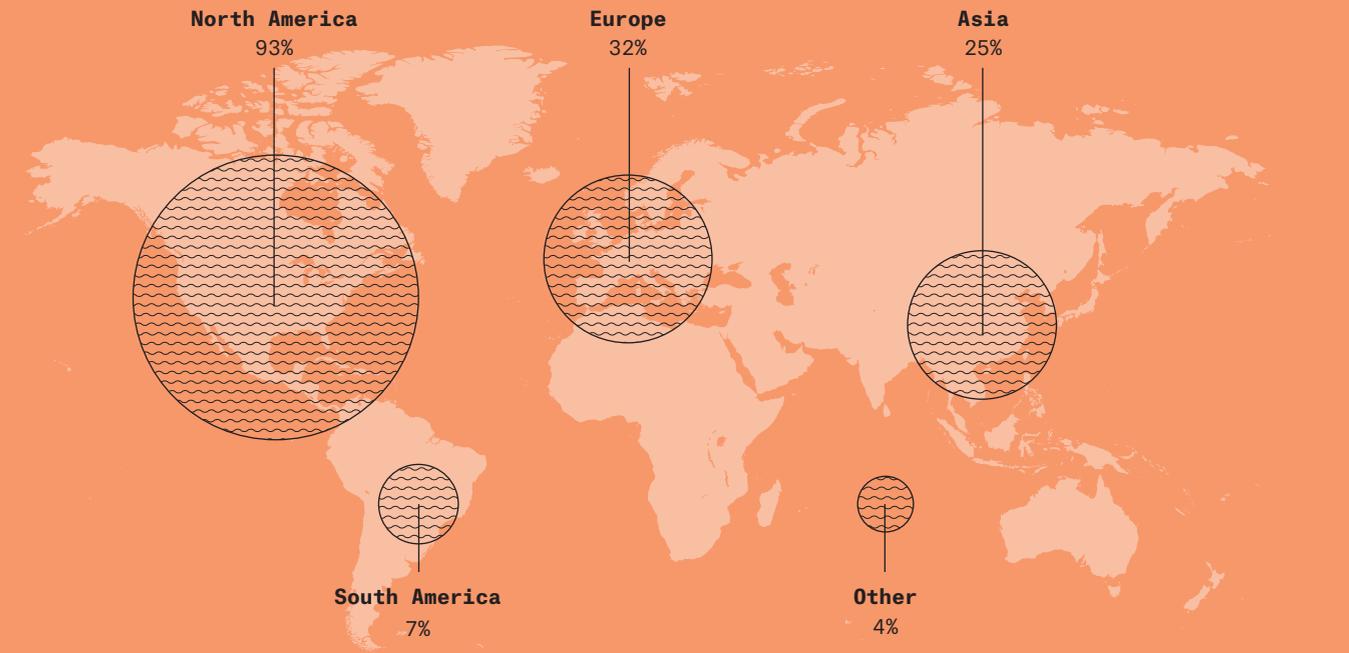
Looking at geographic trends, fabricators point to the Southeast as an area of growth. Fifty-three percent of respondents identified it as a strong market in 2020, and 57 percent predict growth in the region in 2021. The Northeast also continued to be a region of growth for fabricators, with half of reporting fabricators predicting it as a strong market in 2021.

By construction segment, commercial construction continues to drive business for fabricators, despite the contraction of the office construction market segment, and an increased focus on the health care section. A plurality of reporting fabricators identified commercial office buildings as a significant percentage of company business in 2020. Health care construction only represented 9 percent of reporting fabricators' business overall.

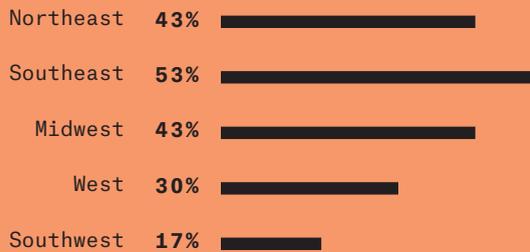
This year's survey also asked fabricators about their raw glass purchasing decisions. All but 7 percent of respondents purchased float glass from North American suppliers. Thirty-two percent reported importing glass from Europe, 25 percent from Asia and 7 percent from South America.



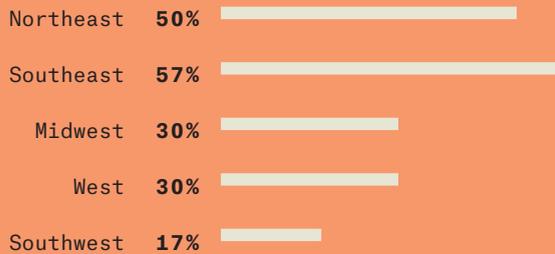
Where did you purchase raw glass from in 2020?*



Which geographic regions have been strongest in 2020?*

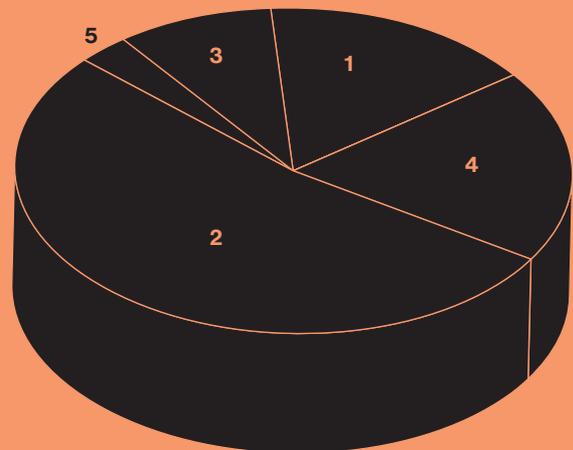


Which geographic regions do you predict will be strongest in 2021?*



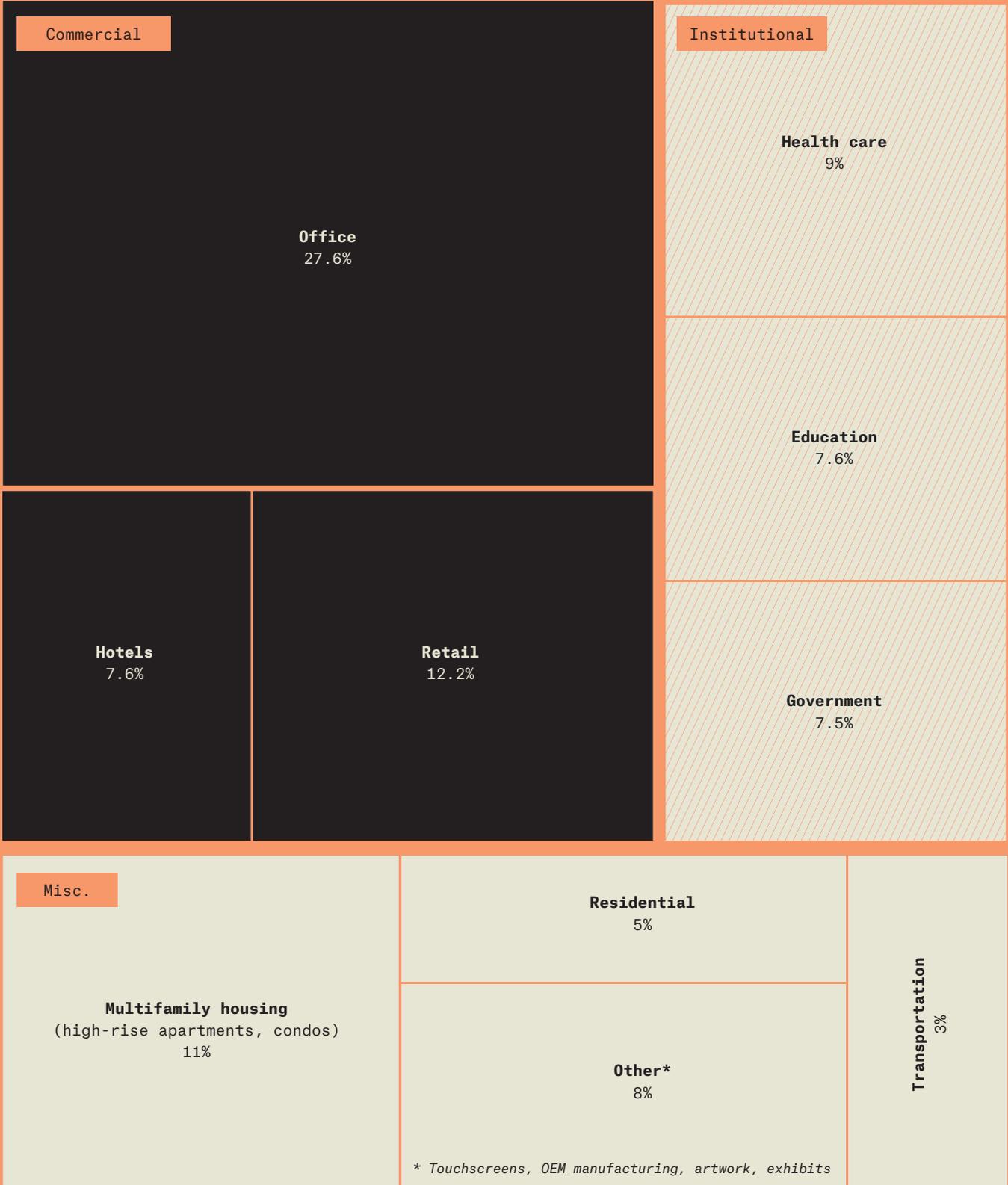
What percentage of your production is commercial vs. residential?

1	100% commercial	19%
2	51-100% commercial	53%
3	50/50% commercial/residential	9%
4	30-50% commercial	16%
5	Less than 30% commercial	3%



*check all that apply

What percentage of your business in 2020 falls into these categories?



ALL ABOARD THE FUSECUBE™ *EXPRESS*

DFI's new FuseCube Express is a high-speed, protective coating machine born out of the need to treat small quantities of glass faster. It streamlines the application of Diamon-Fusion® protective coating onto both sides of the glass at economical rates with uniform coverage.



Treats 1-5 lites in under 10 minutes



5' X 6' footprint for more floorspace

5

One cartridge runs 5 cycles



Protects glass against stains and etching

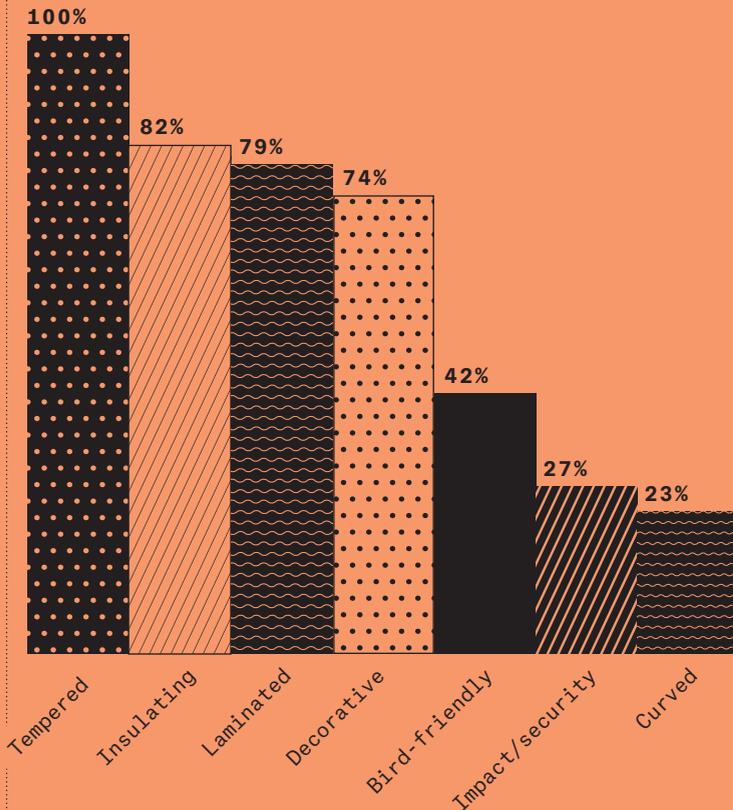
LITTLE CHANGE

Bigger glass continues to spread, according to survey responses by Top Glass Fabricators. Sixty-four percent of fabricators say they fabricate jumbo glass, up from last year's 48 percent of companies. Seventy-four percent of fabricators are now supplying decorative products, and 42 percent are fabricating bird-friendly glasses.

Reporting companies also continued to add production capacity, though at lower levels than the previous year; 68 percent reported adding capacity in 2020, as opposed to 76 percent the year prior. Of those that did add capacity, a significant majority, 88 percent, invested in capital equipment this past year.

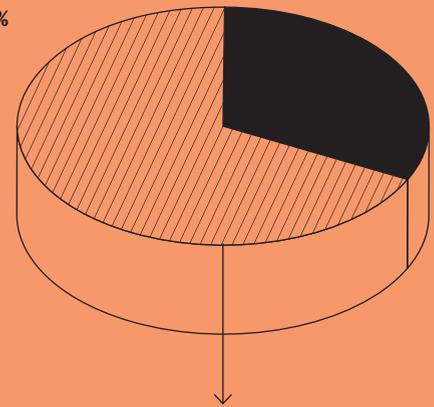
A minority of reporting companies reported that the pandemic affected the type of products they offered. For those that did report impacts, companies cited the increased demand for glass dividers, as well as larger issues getting raw materials due to supply chain issues, and a shift to smaller projects during the pandemic.

What types of glass does your company fabricate?*

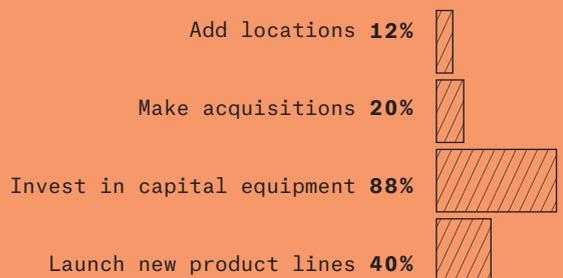


Did your company add production capacity in 2020?

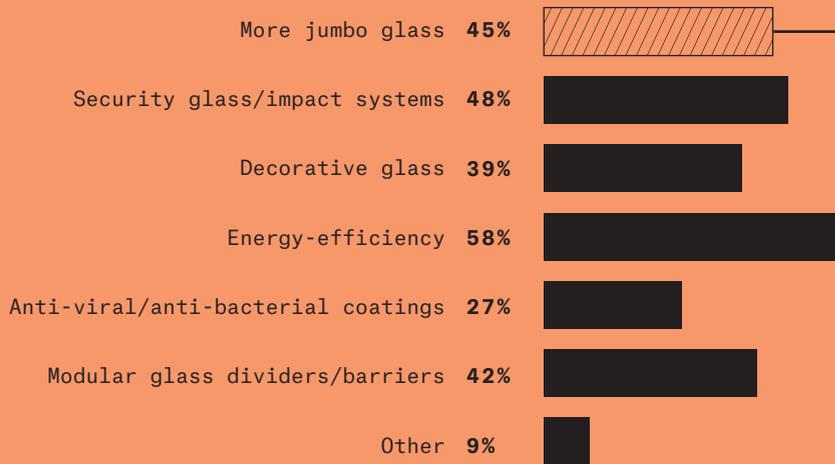
Yes 68%
No 32%



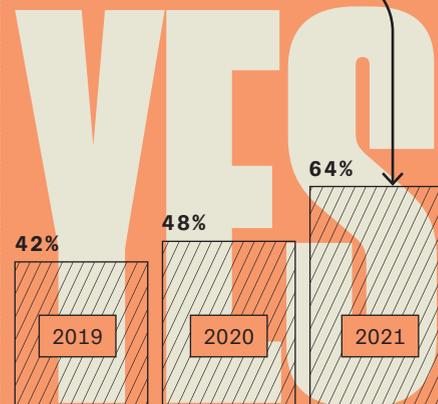
If yes, what kind of capacity was added?*



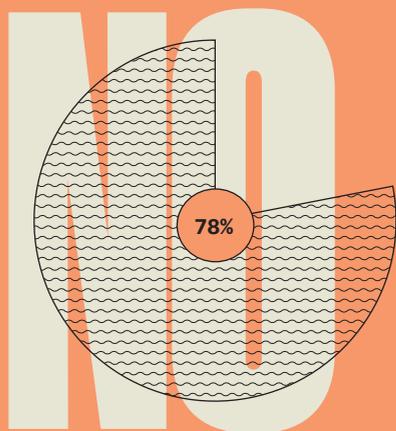
What design trends have you noticed in the last year?*



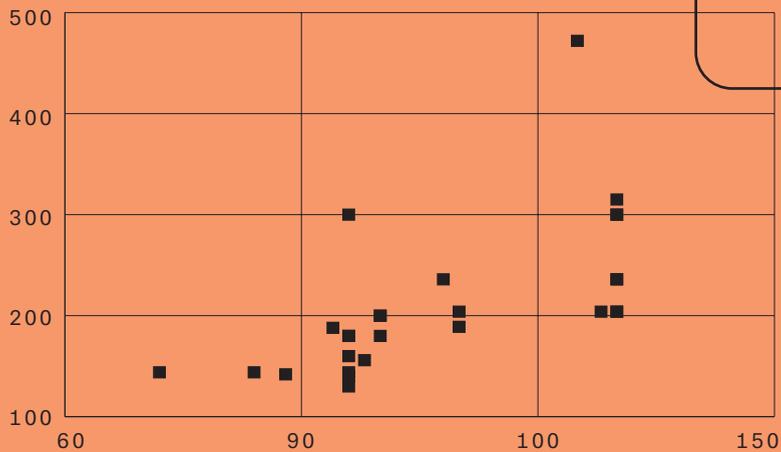
Does your company fabricate jumbo glass?



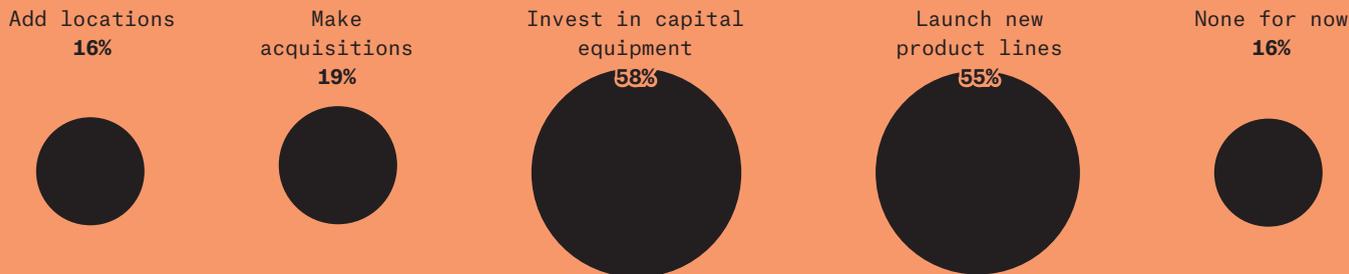
Has COVID-19 affected the kind of products you supply?



What is the maximum size glass you are able to fabricate (WxH in inches)?



What are your company's expansion and investment plans for 2021?*



PROTECTING LABOR & PRODUCTION

Last year's Top Glass Fabricators report was published right as the pandemic's arrival was being recognized in North America. This year's report, with most data collected in late fall of 2020, shows that fabricators were affected by COVID-19 realities in different ways last year, with a through line being the unpredictability of labor and raw material supply.

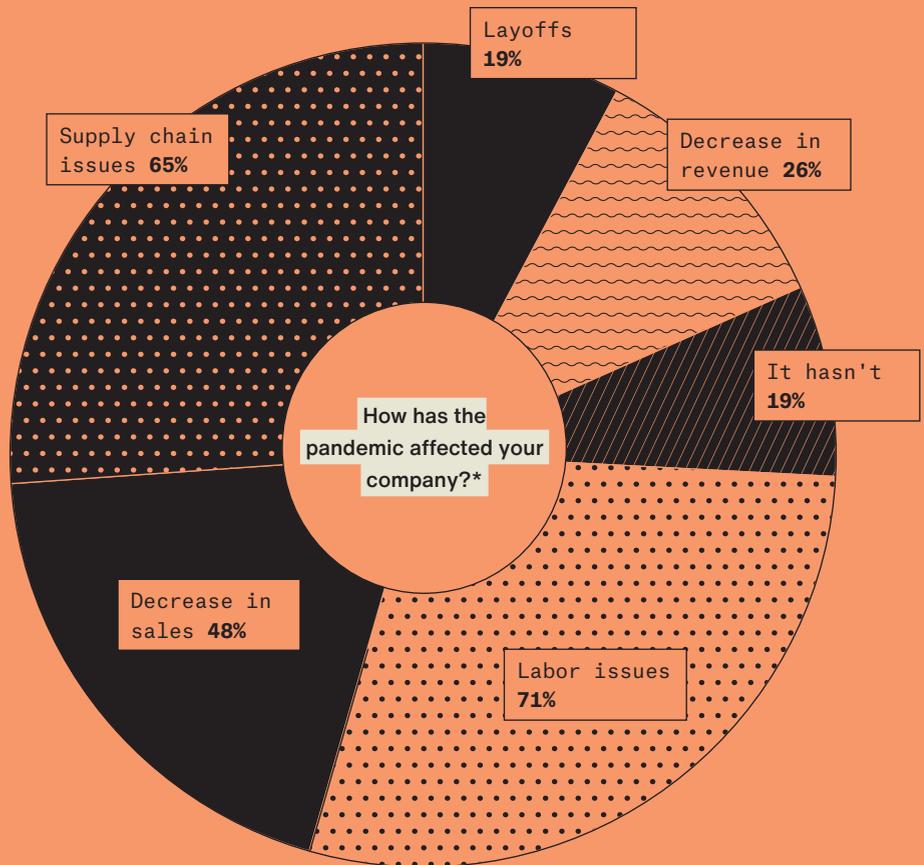
Kensington Glass Arts reported major work delays and shutdowns due to the pandemic. "Many of our jobsites were shut down due to coronavirus," says Jim Rathbone – Senior Vice President. "Often, an individual at the jobsite from any company was exposed to coronavirus, forcing the entire site to shut down for at least two weeks. Meanwhile, numerous other projects were put on hold pending resolution on office capacity and configurations."

Andrew Russo, vice president at Glass and Metal Craft, says the company's work didn't stop, though the pandemic certainly impacted speed and capacity. "We were deemed an essential company during the spring COVID shutdown, so our production never stopped, though it ran at a slower pace," he says. "Once open, we were faced with an initial rush, then a slowdown with jobsite delays due to labor and site preparedness. Most recently, we have been faced with material availability, requiring creative steps and considerable

cost to maintain schedules."

Seventy-one percent of companies reported labor issues, and 65 percent of companies reported supply chain issues. A little less than half of reporting companies reported a decrease in sales, and 19 percent reported layoffs.

Many reporting companies described the difficulty of managing employee safety and preventing the spread of coronavirus, as well as delayed projects. Only 19 percent of respondents said their companies weren't affected by the pandemic.



*check all that apply



Inowa

Innovative **hardware** for quality sliding patio doors in Aluminum, Wood, & PVC profiles.



Concealed Hardware



Energy Efficient



Ease of Use

Excellence in Window and Door Hardware | rotonorthamerica.com

Sliding Patio Door • Swing Door • Patio Fold • Patio Lift • Casement • Tilt & Turn • Sash Locks

5

DECORATIVE GLASS TRENDS TO WATCH

HOW TO KEEP UP WITH DEMAND
FOR LARGER SIZES, MORE
VIBRANT COLORS,
BIRD-FRIENDLY PRODUCTS AND
MORE

By Katy Devlin

N

ew design trends in the decorative glass market call for larger sizes, custom designs, vibrant colors, new inks, multi-functional products and more. Successful glass fabricators keep a close watch on emerging trends, track relevant changes in codes and standards, and implement factory best practices to meet higher expectations and more stringent requirements.

The National Glass Association has a range of technical task groups working to develop industry resources to help fabricators navigate the emerging trends across the decorative glass market. Working with leaders from the NGA task groups, this article presents five top trends in decorative glass, with best practices, market trend information and details on relevant NGA resources. To learn more about the NGA's technical and advocacy activities, or to get involved, contact membership@glass.org.





① The 160-foot-tall La Ventana al Mundo monument in Barranquilla, Colombia, is clad in more than 800 colorful panels of painted, laminated glass. The panels consist of laminated glass with Trosifol Ultra Clear PVB interlayer from Kuraray and a 100 percent ceramic enamel coating from Glass Coatings & Concepts on the No. 4 surface. The fabricator was Tecnoglass. ② The escalator wall of Union Station in Toronto is clad in white back-painted glass fabricated by Goldray Glass. Photo courtesy of Goldray Glass.

01

PAINTED GLASS

From backsplashes to marker boards and partitions to wall cladding, painted glass products increasingly make their mark on building construction.

Interior painted glass applications have gained steam in recent years, in large part due to the product’s resilience, say fabricators and suppliers. “Glass is such a perfect material for high

traffic areas due to its durability,” says Michael Saroka, executive VP and COO of Goldray Glass. “Painted glass is an obvious design choice over other colored finishes.”

The COVID-19 pandemic is also driving demand, says Casey Anderson, marketing manager, ICD High Performance Coatings. “With COVID, interior back-painted glass wall cladding and

marker boards have shown increases in mainly health care, education and business sectors because of their durable nature and ability to withstand unlimited cleaning cycles,” she says. “With glass also being non-porous, it won’t absorb bacteria, which makes for easy sanitization.”

New paints allow for more vibrant colors, adds James Wright, corporate sales manager, Virginia Glass Products. “Organic paints are more opaque and brighter in color than traditional paints used for spandrel applications,” he says. “You [can use it] in applications like marker boards, backsplashes, wall dividers where light can shine on the edges of the glass, or behind the painted side of the glass, and not affect the color or read through as much.”

Wright says he expects the growth trend to continue, as owners and designers seek more painted glass solutions in residential and commercial projects. “I see it continuing to increase in homes for living room walls, fireplace accents, wet bars, bookcases, cabinets, tabletops, counters and walls behind reception desks,” he says.

What is painted glass? “Painted glass is really a misnomer,” says Jim Gulknick, vice president, director of operations, McGrory Glass. “Glass is coated with chemically bonded pigments or fired onto the glass when mixed in a frit. Paint on a wall sticks to the wall surface. Normal paint on glass would simply peel off. Ceramic inks are printed or screened and fired on glass.”

Tips for fabricators

- Ensure a glass coating is developed and approved for glass as a substrate. Never use paints intended for use in other applications, such as home exteriors or vehicles, on glass.
- Make certain the coating manufacturer approves and warrants the intended end-use application.
- Consider environmental factors that might come into play, such as temperature, humidity, or proximity to chemicals or radiation. Discuss any concerns with a coating supplier.
- Make sure the installation will comply with all component manufacturers' recommendations and requirements.
- Fabricate the coated glass according to the coating manufacturer's recommendations and requirements.

Resources

Best Practices for Installed Painted Decorative Glass,
NGA Glass Technical Paper

Task group member companies:

- Virginia Glass Products (task group chair)
- AGC Glass Company
- Fenzi North America
- Glass Coatings & Concepts LLC
- Goldray Glass
- ICD High Performance Coatings
- Kensington Glass Arts Inc.
- McGrory Glass Inc.
- Schilling Inc.

①



Architects and owners want more from their glass colors. On the building exterior, they demand spandrels that blend seamlessly with the vision glass. On the interior, they increasingly seek bold colors to achieve more ambitious, vibrant designs.

“The trend of façade visual harmonization, the aesthetic to indiscernibly match the vision and spandrel glass, is ever-increasing, and with all the innovative configuration options, I don’t foresee this color demand wave cresting anytime soon,” says Casey

Anderson, marketing manager, ICD High Performance Coatings.

“Carrying a brand theme throughout an office complex, adding a dash of emotional and psychological positivity, imparting biophilic properties, creating interest through features, and supporting innovation through harmonic vibrations—colors can do all this and more,” says McGrory Glass’ Gulnick.

Looking at specific color trends, “colors have evolved from those simulating relatively neutral

earth tones to the vibrant jeweled tones,” says Julia Schimmelpenninck, industry technical leader, Customer Applications and Support Lab manager, Eastman Chemical Co.

Goldray’s Saroka adds that “whites—all one million of them—neutrals and blues are always in fashion. For metallics, silver is always popular. But we are seeing a lot of bright, highly-saturated colors for accent areas more than we have before and bronze is becoming more popular in metallic usage.”

02

COLOR

②



① Kaleidoscope in Tianshui, Gansu Province, China, was the 2020 Vanceva World of Color Awards interior winner. The project features glass with nine different Vanceva Color PVB interlayers from Eastman. The fabricator was Shanxi Jingfeng Glass Co. Photo by CreatAR Images. ② On Avalara Hawk Tower at Stadium Place in Seattle, Washington, a specific spandrel glass color helped create a transition-less appearance throughout the vision and spandrel glass on the building's façade, according to officials from glass manufacturer Vitro. The building features ICD Opaci-Coat-300 2-3203 Mucky Water on surface 4 and Vitro Clear with Solarban 67 on surface 2. ③ Designers relied on dichroic glass panels to add color and flare to a recently completed East Coast office project. McGrory Glass supplied its OceanSeries Dichroic Glass for the project. Photo courtesy of McGrory Glass.

Tips for fabricators

- *Be precise.*
 “Colors need to match. Samples need to match production. And, each piece off the line needs to meet the first and last piece off the line. Brand sanctity is key. If a logo has a certain red, that red needs to be matched within the minimum threshold of perception.”—Gulnick
- *Build a mock-up with accurate lighting*
 “During color approval process, make a full-scale mock-up of the entire system early in the process to observe onsite (if possible) with appropriate lighting. If it's an outdoor application use sunlight. If it's an indoor application, use the lighting it will be subjected to indoors. This will help determine expectations.”—Tim McGee, sales manager, Glass Coatings & Concepts.

Resources

Measuring Color of Decorative Material in the Field, NGA Glass Technical Paper

Task group member

companies:

- Goldray Glass (task group chair)
- AGC Glass Company
- Dip-Tech, a Ferro Company
- Glass Coatings & Concepts
- ICD High Performance Coatings
- McGrory Glass
- Schilling Inc.
- Walker Glass



111 Main in Salt Lake City features a lobby enclosed in 35-foot-tall, ultra-clear, low-iron structural glass. The glass is laminated glass with SentryGlas from Kuraray. Photo by Steel Encounters.

By the numbers

64%

of 2021 Top Glass Fabricators are able to process some type of large-scale or jumbo-sized glass. (More on page 43.)

03

LARGE GLASS

The trend toward larger glass sizes continues, driven by demand for sleek, open façades and uninterrupted views, say industry experts. “Designers want to achieve unobstructed views by minimizing the frequency of opaque mechanical

connections and, in turn, increasing glass size,” says Kayla Natividad, architectural technical services engineer from NSG Pilkington.

The trend, which started in retail applications, has grown to include “requests for larger and larger glass

across the board in the different market segments,” says Jon Griggs, senior field service engineer, Guardian Glass. “Larger glass sizes will continue to be an important design element in commercial buildings.”

Glass manufacturers have responded to demands with investments in new jumbo glass coaters, including two in the United States—Guardian at its Carlton, Michigan, plant, and Vitro Architectural Glass in Wichita Falls, Texas. Many fabricators, in turn, have purchased processing and handling equipment to fabricate and move the large sizes.

The trend is evolving beyond just big glass, says Vaughn Schauss, manager, Technical Consultancy Americas, Kuraray America

Inc. “Trends include the use of large, curved glass, and incorporating security performance when designing large glass storefronts,” he says.

Despite the quick progress in large-format glass production, the industry lags in terms of standards, certification and testing. “The industry wants to create additional knowledge and information supporting large glass to inform the market; however, little has developed on the testing and certification front despite the additional safety risk of such large and heavy products,” says Jim Gulnick, vice president, director of operations, McGrory Glass. An NGA task group is currently working to develop resources addressing quality specifications for large sizes.

Introducing EX Series Surface One Ceramic Glass Enamel



Newly developed innovative enamel product line by
Glass Coatings and Concepts for surface one applications.

- Gives building architects unique tools to create new decorative glass designs
- Creates visual markers visible to birds for Bird Friendly glass, deterring collisions
- Standard and custom color matching capabilities available

Protect your investment with Glass Coatings & Concepts.

www.gconcepts.com | sales@gconcepts.com | 513.539.5300



Tips for fabricators• *Start gradually.*

“Start with lower-volume projects to prove out capabilities. This will help flush out obstacles and allow the fabricator to adapt prior to taking higher-volume projects.”—Griggs

• *Consider factory restrictions.*

“Fabricators should insure there is adequate room to move the glass about the plant to avoid accidental breakage. Equipment (cranes, suction cups, storage racks, etc.) should be sized properly to facilitate the large sizes. Washers, tempering ovens, laminating lines and autoclaves, insulating lines, and even quality control should be carefully evaluated for large glass.”

—Schauss

• *Increase quality control.*

“When fabricating these large panels, there is an option of using tinted float glass, frit, paints, inks, coatings, films or interlayers to create colored glass. ... A change in thickness, uniformity of coverage, pinholes, creases or folds are all ‘watch-outs’ for fabrication that require more rigorous attention as the overall size increases.”

—Schimmelpenningh

• *Practice safe handling.*

“We need to ensure our teams have the proper equipment to safely handle large glass throughout the production process, from handling, tempering and laminating to packaging and shipping.”—Rick Wright, technical services director, Oldcastle BuildingEnvelope.



① The National Arts Centre in Ottawa, Ontario, Canada, features Guardian SunGuard SuperNeutral 70/41 coating on low-iron glass in sizes up to 95 inches by 228 inches. The fabricator was Carey Glass. Photo by doublespace photography.

② Retail applications are popular locations for large glass. Pictured is a Kia Motors in Trois-Rivieres, Quebec, Canada, which features floor-to-ceiling glass panels manufactured by NSG/Pilkington and fabricated by Prelco.

• *Conduct mockup reviews.*

“Conducting these very detailed reviews assures the glass meets the required design performance, such as: glass deflection, structural load and sightline requirements.”—Wright

Resources:

Fabricator Considerations for Large Glass Products, Joint NGA/FGIA document (pending final approval).

Task group member companies:

- Guardian Glass (task group chair)
- Eastman Chemical Co.
- Fenestration & Glazing Industry Alliance
- Garibaldi Glass Industries Inc.
- Glass & Mirror Craft LLC

- Kuraray America Inc.
- McGrory Glass Inc.
- MGI McFarquhar Group Inc.
- North Glass
- Oldcastle BuildingEnvelope
- NSG Group/Pilkington
- Tristar Glass Inc.
- Viracon Inc.
- Vitro Architectural Glass
- Vitrum Glass Ltd.
- Woodbridge Glass Inc.



City of Seattle's Cedar River Municipal Watershed in North Bend, Washington, features AviProtek bird-friendly glass from Walker Glass on the No. 1 surface and high-performance Vitro Solarban 70XL on the No. 3 surface. Vitrum was the glass fabricator. Photo by Lara Swimmer.

04

BIRD-FRIENDLY

The trend for bird-friendly glass is only just beginning, according to industry officials.

“Bird-friendly products help save birds from accidental impact, injury and possible death as a response to utilizing more glass as is desired in modern construction,” describes McGrory Glass' Gulnick. The products feature markings visible to birds that reduce collisions. The markings can be made through etching, films,

printed patterns, ultra-violet coatings and more.

Calls for bird-friendly glass will continue to rise due to new building code requirements across North America. “More and more cities are adopting bird deterrent legislations. With municipalities across the continent making a move to bird-safe building practices, we can confidently say that the movement is here to stay,” says Danik Dancause, marketing operations manager for Walker Glass Co.

Some new regional and nationwide legislation may even be on the table. “A bill passed by the U.S. House of Representatives is now in the hands of the U.S. Senate,” according to Tim McGee, sales manager, Glass Coatings & Concepts.

Efforts of conservation groups have been critical to building momentum and support for requirements at the municipal level, says Dancause. Groups such as the American Bird Conservancy,

local Audubon chapters, FLAP Canada and Safe Wings Ottawa “work tirelessly to collect data about the threats that buildings pose to avian populations and put pressure on their local officials to make bird deterrence a priority,” he says. “Due to their efforts and to the cooperation of their local governments, we expect that within the next five years we’ll see twice as many cities with bird-safe building legislations as there are now.”

Market challenges:

- *Need for education*
 “Building professionals may not be familiar with these solutions, especially when it comes to the newer technologies. Bird-safe glass goes beyond the kinds of clear glass with coatings that the industry is accustomed to.”—Dancause
- *Cost concerns*
 “This is a value-added product, so building owners and general contractors want to see some clear advantages before incorporating it into their budgets. Faced with this concern, we point out the risk of fines, bad press and even lawsuits against building owners who flout local building legislation designed to protect birds.” —Dancause
- *Lack of nationwide standards*
 “To solve for this issue in the short term, I would encourage architects and spec writers to seek out local building codes for bird-friendly glass and clearly outline the product requirements in the project specification.”—OBE's Rick Wright.
- *Shortage of test data*
 “There is the shortage of good test data for various glass options, including silk-screened, acid-etch and UV coatings. This is a result of building product manufacturers having very limited ability to perform bird-friendly glass testing with actual birds.”—Wright



- ① BirdProtect DotView glass from McGrory Glass.
- ② Dotted pattern on the vision and spandrel glass of a walkway protects birds at University of Saskatchewan in Saskatoon. The spandrel features ICD Opaci-Coat on the No. 4 surface, Walker AviProtek on the No. 1 surface and Vitro Solarban 70XL on the No. 2 surface.

Resources:

Bird-Friendly Glazing in Building Construction, NGA Advocacy One-Page Handout for Legislators

Best Practices for Bird-Friendly Glazing Design, NGA Glass Technical Paper

Task group member companies:

- Walker Glass Co. (task group chair)
- 3M
- AGC
- Dip-Tech, a Ferro Company
- Eastman Chemical Co.

- Glass Coatings & Concepts LLC
- Guardian Glass
- ICD High Performance Coatings
- Kuraray America Inc.
- Madico
- Manko Windows
- Oldcastle BuildingEnvelope
- NSG Group/Pilkington
- Tristar
- Trulite
- Viracon
- Woodbridge Glass

Bird-Friendly Glass Design Strategies, NGA Glass Technical Paper

Task group member companies:

- Walker Glass
- 3M
- Eastman Chemical Company
- Fusion Ceramics
- Goldray Glass
- Kuraray America Inc.
- McGrory Glass
- NSG Group/Pilkington
- Sage Glass Inc.
- Trulite
- Vitro
- Vitrum Glass

AviProtek®

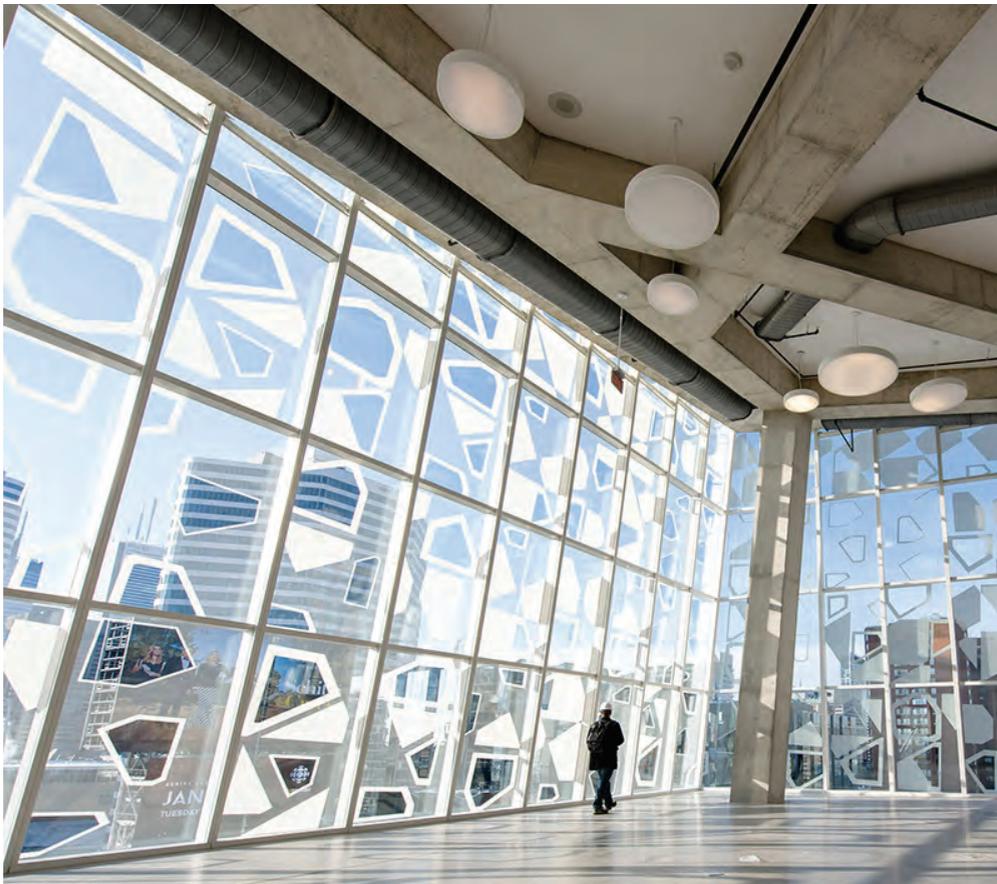
Leading the way in bird friendly glass



There is an **AviProtek®** solution for everyone, everywhere...

1st surface • etch • low-e • UV
tested • 10 year warranty
EPD & HPD® certified

walkerglass.com



The façade of the Ryerson University Student Learning Center in Toronto, Canada, features more than 3,000 panels of decorative digitally printed glass in a triple-sealed unit. The glass was printed by Prelco using a Dip-Tech printer. Photos by Clifton Li.

By the numbers

5%

“Today about 5 percent of glass processors around the world print digitally, and we expect the numbers in the next 5 years to increase to 8-10 percent following the introduction of the automotive and appliances industries to the advantages of digital printing.”—Yariv Ninyo, head of business development, Dip-Tech, a Ferro company.

05

DIGITAL PRINTING

The decorative glass industry has transformed in the last decade alongside the increased adoption of digital printing on glass, say industry sources. Near-unlimited design opportunities plus more affordable one-off designs have made decorative glass possible for projects big and small, and inside and out of a building. “Print on glass has become a mainstream product,” says Annette Panning, director, marketing and product

management, Viracon.

“Digital printing allows for unlimited design potential, giving the designer creative freedom to fulfill any vision they can imagine,” says McGee of Glass Coatings & Concepts.

Adds Goldray Glass' Saroka, “Digitally printing has expanded the scope of design options for decorative glass. One-off designs are much more affordable and bitmap graphics are more achievable.”

In interiors, digital printing offers opportunities to bring art, branding or wayfinding into buildings. On the exterior, architects and owners are increasingly looking to digital printing on glass to create multi-functional decorative façades, often seeking sun control or bird protection, in addition to meeting aesthetic goals.

Panning estimates that about 30 percent of Viracon's printed projects specify covering the entire

vision area across the entire façade. “About 10 percent of [Viracon's] printed projects specify print across a section of each lite or section of lites on a building to add accent, to reduce glare and solar heat gain and/or provide bird-friendly glass; and about 60 percent of printed projects specify print on a prominent section of a façade to add accent or again bird-friendly glass,” she says.

VIRACON THERMAL SPACER

WE JUST THREW CONVENTIONAL SPACER THINKING OUT THE WINDOW.

The Viracon Thermal Spacer (VTS™) pushes spacer technology to the modern edge of performance. VTS™ replaces a traditional spacer, desiccant and primary sealant with a better-performing single component spacer. Available in glass sizes up to 130" x 236", the VTS™ delivers superior seal integrity, thermal performance and aesthetics. Learn more at viracon.com.



VIRACON®
GLASS IS EVERYTHING™

What's next**• Mass production**

"In recent years we've been seeing increasing demand for digital printers that support mass production. ... Digital printers are becoming much faster, providing an industrial solution that helps reduce labor and costs while increasing productivity."

—Ninyo

• New inks

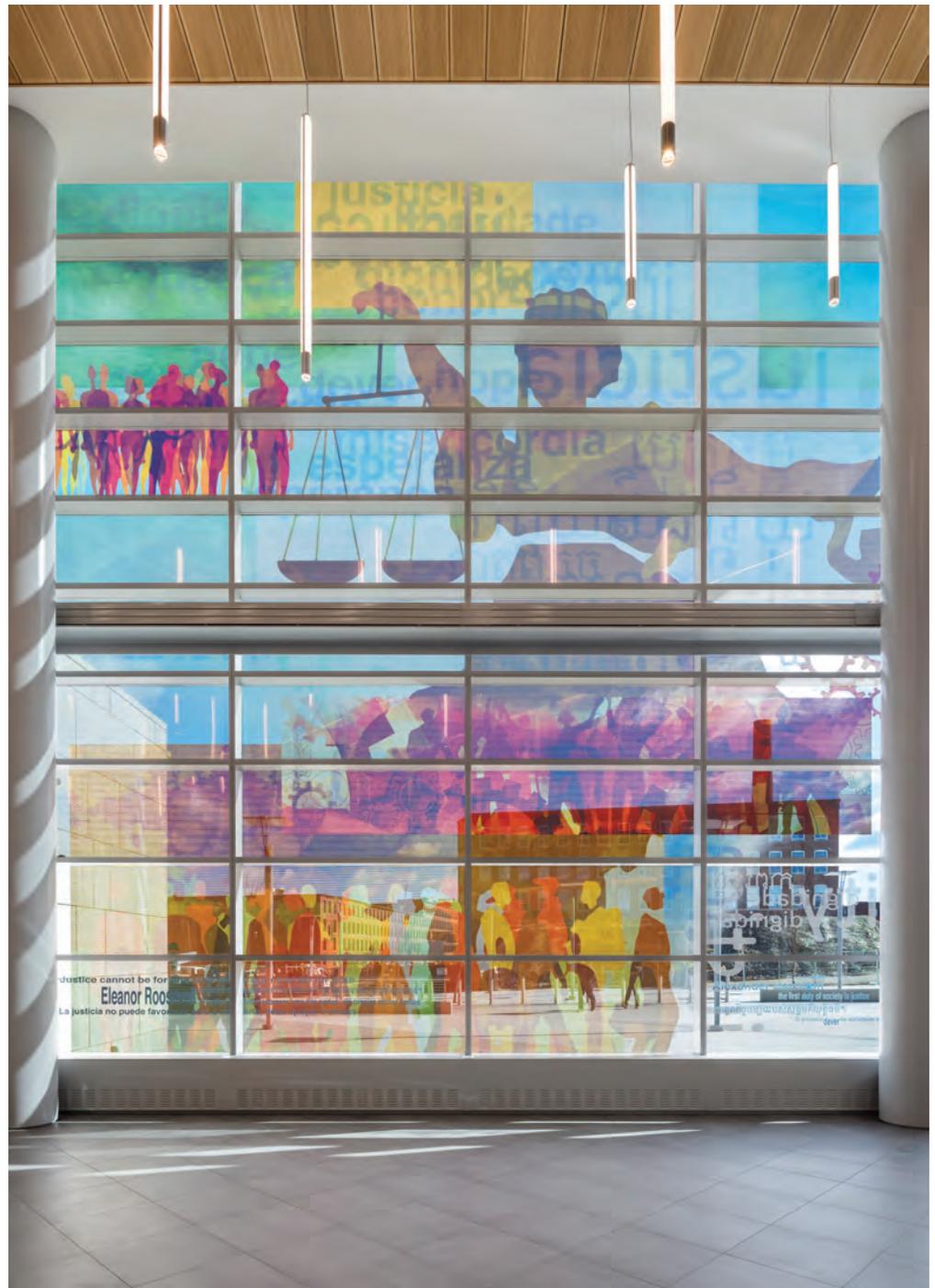
"[We're seeing] demand for advanced inks that provide solutions for decorative glass that is also practical and sustainable."—Ninyo

• First-surface printing

"The next industry trend is printing on the first surface of the glass unit. This brings in a new set of considerations to be evaluated. For instance, what is the effect of exposure of the print to the exterior environment? We need to consider how print on the first surface is affected, fading from the sun and discoloration from pollutants."—Panning

**Online**

Find Decorative Glass resources from the NGA at glass.org/store. Click Browse, then search by title or keyword. Additionally, find Glass Technical Papers and other resources from the NGA Technical Committees.



A wall of digitally printed glass greets visitors to the Lowell Justice Center in Lowell, Massachusetts. The glass is DigitalDistinctions printed glass from Viracon. Cherry Hill Glass was the glazing contractor.



BRINGING YOUR CREATIVE VISIONS TO LIFE.

From building facades to stunning interiors and public art displays, GGI offers specialty glass solutions, custom fabrication and oversized capabilities designed to enhance the modern built environment. Glass that is functional, decorative, and environmentally friendly combined with precision workmanship and five generations of glass industry expertise.

This is what you can count on from GGI.

ALL-GLASS SYSTEMS • DECORATIVE GLASS • FIRE-RATED • SPECIALTY GLASS



800-431-2042



sales@generalglass.com



www.generalglass.com

SEE WHAT
GLASS
CAN DO
GGI

PRODUCTS

SPONSORED CONTENT



SOLUTION: STORMMAX® HURRICANE-RESISTANT STOREFRONT

Oldcastle BuildingEnvelope launched the StormMax® Hurricane-Resistant Storefront series, a fully upgraded framing system that stands up to wind, water and projectiles, achieving Category 5 storm protection. The series is offered in three models—FG-5700 StormMax®, FG-5750 StormMax® and FG-5750T StormMax®—to meet a range of customer needs.

Impact ratings

The series meets the most stringent impact codes, including: small and large missile impact tests - up to Missile Level D; ASTM E1886 and ASTM E1996; Category 5 Wind Zone and Florida HVHZ; Florida Building Codes TAS 201, TAS 202, TAS 203. OBE offers easy, on-demand access to Texas Department of Insurance (TDI) and Florida Product Approval (FPA) product evaluations for quicker bid submissions.

From specification to delivery

Because OBE fabricates both the StormMax® storefront series framing and a wide variety of glass infills, the company's single-source capability

allows them to streamline the process and provide customers with access to the options that best fit their design, budget and timeline. Additionally, customers can save time and money by customizing their system — from the glass infill, to a variety of simplified anchors and mullions, to various reinforcement options — to achieve the protection they need without over-engineering.

Product details

The StormMax® storefront features a screw spline assembly and features



KEY FEATURES

SIMPLIFIED ANCHORING OPTIONS ALLOW FOR FASTER, EASIER INSTALLATIONS.

PRE-GLAZING REDUCES LABOR COSTS AND ACCELERATES INSTALLATION.

INSIDE GLAZING CAPABILITY IS IDEAL FOR DENSE URBAN AREAS AND ABOVE-GRADE APPLICATIONS.

ALUMINUM REINFORCING OPTION IS LIGHTER, EASIER TO WORK WITH, AND EASIER TO DRILL.

A BROAD OFFERING OF HURRICANE-IMPACT-TESTED INTERLAYERS TO WEATHER WHAT EACH JOB DEMANDS.

extruded water deflectors. The storefront's anchoring flexibility is dependent on wind loads with no special engineering required for standard substrates. StormMax® storefront design allows for aluminum reinforcing to balance added strength with ease of installation and is designed to seamlessly integrate with OBE's standard StormMax® entrance system. It is available in an array of architectural paint colors and anodized finishes.

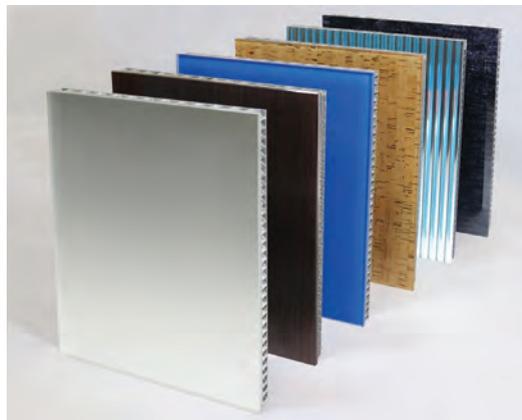
Learn more about the StormMax® storefront series at obe.com.



01



02



03

01. Glassboards

GGI launched MAX Glassboards, a line of multi-functional glassboards. With applications in many industries, from health care to education, the boards are highly customizable, are available in standard or custom colors, can be printed with corporate logos, line art, grids, patterns or other designs, and are available as magnetic and non-magnetic, single or dual-sided. Additionally, they are environmentally friendly, mold-resistant, durable and hygienic, requiring no special cleaning agents or toxic solutions.

800/431-2042 | GENERALGLASS.COM

02. Glass kit

Vitro Architectural Glass introduced a new tinted glass kit featuring a range of uncoated blue, green, gray and bronze glasses. The package contains 4-by-6-inch uncoated samples of Solexia, Atlantica, Azuria, Solarblue, Pacifica, Optigray, Solargray, Graylite II and Solarbronze glasses. The samples are packaged in a compact box that is easier to ship, store and carry, and more environmentally friendly than previous Vitro glass sample boxes, say officials.

855/887-6457 | VITROGLAZINGS.COM

03. Decorative laminated glass

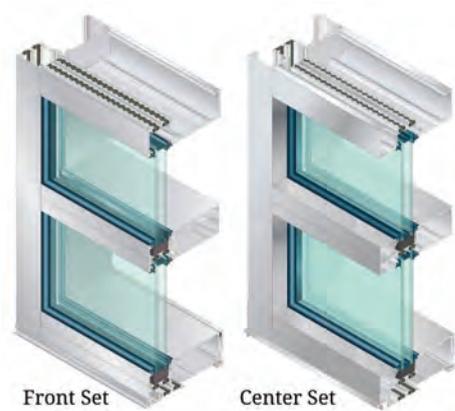
Bendheim's new HexaLite is a honeycomb-reinforced glass. The laminated safety cladding material is ideal for elevator interiors, lobbies, and designs requiring large glass panels and long spans. HexaLite's aluminum honeycomb backing lends strength and rigidity to any glass thickness, while minimizing the overall weight of the panel. It can add as much as ½ inch to the thickness of the panel, with just 1 pound per square foot additional weight.

800/221-7379 | BENDHEIM.COM

PRODUCTS



01



02



03



04

01. Glass door and wall

C.R. Laurence Co. introduced a new bi-folding glass door and wall system, the Palisades S90. Product attributes include a slimline profile, concealed hinges and a 12-foot maximum frame height, minimizing hardware and maximizing views. The system has a CW40 Performance Grade rating, showing superior thermal and structural performance, says the company, and makes it ideal for exterior applications in demanding environments. Additional features include interior or exterior folding panels, and a thermally broken structure with 1-inch insulating glass. 800/421-6144 | CRLAURENCE.COM

02. Storefront system

Kawneer Co. introduced the new Trifab VersaGlaze 601/601T/601UT front set framing system, an ultra-thermal, 6-inch storefront system. Trifab VersaGlaze 601 offers architects a choice of front and center glass plane applications in non-thermal, thermal and ultra-thermal configurations. Ideal for a wide range of building projects, including those where an economical alternative to a low-rise curtain wall is desired, the 3-in-1 series includes the non-thermal Trifab 601, the single thermal break Trifab 601T and the dual thermal break Trifab 601UT. 770/449-5555 | KAWNEER.COM

03. Sunshade

Tubelite Inc. introduced MaxBlock single blade sunshades with a single, horizontal, airfoil-shaped blade in 6- and 9-inch depths, and widths spanning up to 149 inches. The product can be manufactured with recycled aluminum content, and its attributes support projects seeking certification through U.S. Green Building Council's LEED rating systems, and other performance-based environmental and wellness programs. MaxBlock sunshades can be finished in a choice of durable anodize, colorful painted coatings or simulated woodgrain powdercoat. 800/866-2227 | TUBELITEINC.COM

04. Hardware line

Roto North America's X-DRIVE Evolve casement hardware line features a cover cap, crank handle and lock handle, as well as heavy-duty hardware, which supports bigger and heavier windows. Of special note is the innovative corner drive system, which easily connects to and complements the lock bar series. The corner drive system can be utilized by window fabricators for enhanced marketing and performance benefits, without the need to alter the fabrication of profile material. 860/526-4996 | ROTONORTHAMERICA.COM

THE NIGA STORE

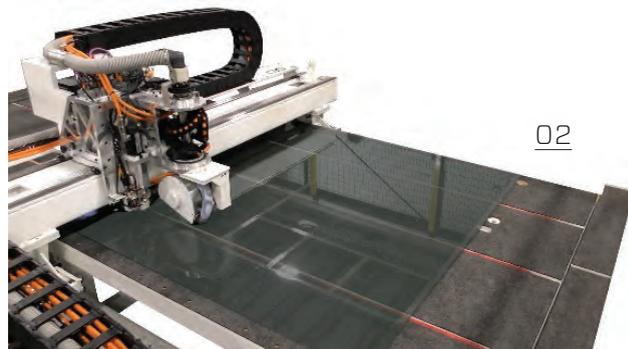
NIGA DELIVERS WHAT
YOU NEED

NGA NATIONAL
GLASS ASSOCIATION
with GANA

Visit glass.org

PRODUCTS

01



02



05



06

01. Coating device

Unelko Corp. launched its new and innovative Invisible Shield Microburst vertical two-sided glass coating machine. Designed by Unelko and Perfect Score Technologies, the machine is a compact, high-output, two-sided automatic coating machine that utilizes ultraviolet and infrared curing to instantly form a molecular bond and protective coating to all glass. It was designed for glass manufacturers and fabricators that rely on high-output, automated systems to produce, fabricate and protect volume shower glass and insulating glass units. 480/991-7272 | UNELKO.COM

02. Cutting table

GED Integrated Solutions introduced its all-new glass cutting and edge deletion table, the CleanCut 1700 Series. The new series, which includes the 1700 model, for cutting, and the 1700-D model, for cutting and deletion, features enhanced speed, updated technical features and increased throughput. The machine's rapid processing, from cycle start to finish, with or without the proprietary optional edge deletion head, is one of its main advantages, say officials. 330/963-5401 | GEDUSA.COM

03. Cutting tool

The Sweepsaver, by Stillmore, reduces the job of cutting a shower door sweep down to mere seconds, say officials. The tool is designed to efficiently cut vinyl soft-leg water diverters and sweeps to precisely the desired height, creating the finishing touch to a custom shower door. The Sweepsaver has six different cutting positions in 1/16-inch increments, is designed for both right- and left-handed users and is manufactured in the U.S. 603/432-3030 | STILLMORELLC.COM

04. Protective glove

Aquila developed the TOG5V glove, which offers impact and vibration resistance in a hi-vis and cut resistance. Coated in sandy nitrile, the glove also provides an extra grip. Cut protection is ensured by the inclusion of Alkimos cut D yarn throughout the glove. As wearability is key to primary safety since comfortable gloves will be more readily worn, the TOG5V features a secure Velcro fastening cuff, making it easier to put on and take off. +(44) 0203-6933-910 | AQUILAGLOVE.COM



03



07



04

Digital tool (*not pictured*)

Faro Technologies Inc. released its new WebShare Software Enterprise offering. An extension of the widely-used FARO Webshare platform, the Enterprise feature allows data to be stored on a company's private server or cloud infrastructure, ensuring full control over the security of its 3D reality data and a fast and easy way to provide access and share project management workflows. The Enterprise feature also offers single sign-on support to simplify the log-on process and avoid managing multiple passwords.

800/736-0234 | FARO.COM

Online resources

(*not pictured*)

Impact Security, the manufacturer of security glazing system DefenseLite, launched new tools and resources to support authorized DefenseLite dealers and architects across the United States and Canada. These resources include a new website, defenselite.com, which features a dealer portal and a dealer locator page; ARCAT, an online specification resource; 4Specs, a spec resource; and a partnership with AEC Daily to launch a continuing education course entitled "Retrofit Security Glazing Solutions for Advanced Forced Entry and Ballistic Protection."

888/689-5502 | DEFENSELITE.COM

05. Temperature tool

Ametek Land launched a new mid-wavelength borescope, the MWIR-B-640, for furnace applications. The MWIR-B-640 enables highly accurate and fully radiometric temperature measurement image data to be taken, stored and trended over the lifetime of the furnace, providing a continuous and clear view, even through heavy smoke and hot atmospheres. It features advanced spectral filtering and a high thermal and spatial resolution to deliver clear live images of the furnace, boiler and stock.

+ (44) 0124-6417-691 | AMETEK-LAND.COM

06. Glass transportation

MyGlassTruck designed a new glass carrying galvanized bottom ledge for their versatile line of Patriot bodies. This new ledge is 7 inches deep, 1.25 inches deeper than their standard ledge, and runs the full length of the rack, uninterrupted by fenders. This new feature is engineered to upgrade capacity for transporting more glass per trip, say officials. The Patriot LT glass truck body is available for Class 3-5 trucks.

844/364-4022 | MYGLASSTRUCK.COM

07. Hardware catalog

The Frameless Hardware Co. published the FSH22 Frameless Shower Door Hardware and Supplies Catalog. The catalog showcases new and innovative products designed to improve and grow glass and glazing businesses. In its 84 pages of professional grade shower door hardware customers will find new solutions spanning shower door hinges, handles, pulls, glass clamps, u-channels, sliding kits, installation tools, supplies, accessories and more.

888/295-4531 | FHC-USA.COM



Tiegs

A+W Software

Dennis Tiegs has assumed the position of chief operations officer for A+W's A+W Clarity business unit. A+W

Clarity is the "software for glass" division at A+W. Tiegs will become a member of the A+W executive management team and will report directly to A+W CEO Peter Dixen.

Tiegs most recently occupied the position of COO Global Accounts in the A+W Clarity business unit. Here, he was responsible for commercial and technical support of international corporate groups. The 35-year-old manager brings customer support experience to the position, according to company officials.



Clark

Vitro Architectural Glass

Vitro welcomed *Ashley Clark* and *Chris Fronsoe*, as national architectural managers. Clark will be manager for northern California, Nevada and Utah. She has more than 15 years of experience in the architecture industry, both within firms as a designer and as an architectural consultant and manager with building product manufacturers.



Fronsoe



Laraia

Fronsoe will manage the Northwest region, and has years of experience working with glass industry professionals, most recently on both vertical and sloped glazing projects.

The company also appointed *Mike Laraia* as senior account manager for the company's residential/specialty glass business segment. Laraia has over 25 years of experience in multiple product segments, including mirror glass and coatings.



Robinson

AGNORA

AGNORA welcomed *Shari Robinson* to the role of vice president of sales and marketing. Within her role, Robinson will be guiding, building and mentoring AGNORA's sales and marketing teams to capture an increased share of the oversized architectural glass market while continuing to nurture AGNORA's award-winning culture and exceptional customer service, say company officials.



Little

Goldray Glass

Goldray Glass appointed *Laura Little* as vice president, sales and marketing.

Little's Goldray journey started in the marketing department in 2004. As she learned about glass from the craftsmen in the plant, who for generations have honed their skills on the many beautiful and unique projects they created, Little developed and nurtured her storytelling abilities, say company officials.



Beecher

Viracon

Viracon promoted *Dave Beecher* to plant manager of its Statesboro, Georgia, facility.

Beecher worked for the United Parcel Service for 16 years, serving in various managerial roles in the Statesboro and Swainsboro, Georgia, centers.

He joined Viracon's operations team in 2005 and has served in the positions of GPC production manager, tempering production manager, insulated glass staging manager and insulated glass production manager.



Denaker

GGI

GGI hired *Jonathan Denaker* to represent the company in the Northeast region.

He will work closely with architects and interior designers to

help them gain a better understanding of GGI's complete range of specialty glass solutions and custom fabrication capabilities designed to support commercial building façade, interior design and public art applications. Denaker brings 13 years' sales and management experience in the building products and construction industry. Most recently, he worked for Materials Inc., specializing in material surfaces and other specialty products for commercial applications, giving Denaker a solid foundation on which to build in the architectural and design community.

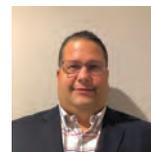


Reichlin

Kensington Glass Arts

Kensington Glass Arts announced that *John Reichlin* assumed the role of president. Reichlin brings with

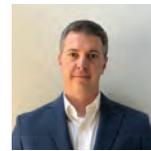
him over 30 years of financial and management experience working with middle-market companies in the Mid-Atlantic region. Reichlin recently joined KGa as its chief operating officer. Prior to that, he served for eight years as president of an East Coast manufacturer and distributor of fresh food products innovating in the production, packaging and distribution of products.



Hoy

Virginia Glass Products/Virginia Mirror

Virginia Glass Products and Virginia Mirror Co. hired *Jeremy Hoy* and *James Wright*. Both new hires join Virginia with extensive and impressive backgrounds in the glass and glazing industry.



Wright

Hoy assumes the role of national product manager focused on laminated and mirror, while Wright takes on the position of corporate sales manager. ■

Classifieds

Glass Magazine®'s classified ad section provides a convenient, cost-effective way to reach our unique and verified print and digital subscribers. The deadline for the May/June issue is Mar. 24, 2021. For more information or to submit your ad for a price quote, e-mail: classifieds@glassmagazine.com. New equipment/product ads are prohibited.

GLASS SHOP FOR SALE

Full-service shop with extensive client list on St. Thomas USVI. Owner retiring after 32 years. 275K or best offer. Contact marty@islandiarealestate.com

HELP WANTED

Glass company seeking qualified glazing estimators and project managers (on-site only) for growing glass company in Los Angeles area. www.precisionglasswork.com. Email resume to jobs@precisionglasswork.com.

BUSINESS FOR SALE

BUSINESS FOR SALE

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

Commercial/residential glass business in NW Pennsylvania. Turnkey including 2 trucks, tools, equipment and inventory. Annual sales of \$425K plus. Established 19 years. \$135,000. Negotiable building lease. Sale of building with additional rentals possible. 814-366-9899 or brucewg67@gmail.com.

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

FOR SALE

X-RAY LEADED GLASS

McGrory Glass, Inc. can provide x-ray leaded glass products cut to size within 24 hours. Laminated/safety x-ray glass is also stocked for immediate availability. E-mail: xray@mcgrory.com Ph: 800/220-3749 Fax: 856/579-3233 www.mcgrory.com

BUSINESS SERVICES

Established: 1996

Services: Highly detailed and accurate, shop drawings and engineering exclusive to the contract glass and aluminum industry. Any manufacturer's products drawn.

Hours/address: M-F, 8 am to 5 pm, 8126 Foxdale Drive, Norfolk, VA 23518



Contact: 757-407-2885, adisales@accuratedrafting.com

More information: www.accuratedrafting.com (drawing examples available there)

Pricing: Contact ADI for a no cost, formal quotation with completion date.

Principals: Bill Pilcher and Tony Wood

EMPLOYMENT SERVICES

Give us a call for the results you deserve!

5825 Ellsworth Ave.
Pittsburgh, PA 15232

1-800-875-6268
412-954-0000
FAX 412-954-0030

www.holampcoresources.com
patti@hlcinternational.com
gary@hlcinternational.com

USED EQUIPMENT



YOUR INSULATED GLASS EQUIPMENT SPECIALIST

Ask about our NEW & USED IG systems.

ameracanequipment.com
(855) 669-9108

NEW AND USED GLASS MACHINERY

We manufacture **NEW** stainless glass washers. VERTICAL & HORIZONTAL

www.americanglassmachinery.com
(724) 348-8450
vps@americanglassmachinery.com

CONSULTANT SERVICES

Full Service Consulting Programs

- Marketing
- Sales
- Codes
- Operations
- Research
- & so much more!

solesourceconsultants.com | info@solesourceconsultants.com

KS DRAFTING & DESIGN, LLC

High quality, accurate, on-time shop drawings and engineering services.

Kyle Schneck 717-228-7114

kyle@ksdraftingdesignllc.com

New website:

ksdraftingdesignllc.com

WANTED

WANTED: GLASS

...used, surplus, or obsolete inventories of tempered and insulated glass panels. Call Damon w/repurposed MATERIALS, 303/321-1471.

Suppliers Guide

ARCHITECTURAL FINISHES

ANODIZING



Stylmark Inc.
6536 Main St. NE
Minneapolis, MN 55432
US: 800/328-2495
Phone: 763/574-7474
Fax: 763/574-1415
E-mail: info@stylmark.com
www.stylmark.com

NGA

COLOR COATING

GlassKote USA
Phone: 866/664-5683
E-mail: info@glasskoteusa.com
www.glasskoteusa.com

NGA

ARCHITECTURAL GLASS/FLAT GLASS

GENERAL



Coniston Products
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com



GGI
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



Glassfab Tempering Services
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com

ADV



McGRORYGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

ADV
NGA

ANTI-REFLECTIVE



McGRORYGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

BENT

Go to category BENT GLASS

BLAST RESISTANT



RAY-BAR
USA
Security, Ballistic Glass and IGU's
US: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.raybar.com

NGA



SAFTI FIRST™ Fire Rated Glazing
100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com

ADV
NGA

Vetrotech Saint-Gobain Fire-Rated Glass and Framing

2108 B St. NW, Ste. 110
Auburn, WA 98001
Phone: 888/803-9533
E-mail: vetrotech.sales@saint-gobain.com
www.vetrotechusa.com

ADV
NGA

BULLET RESISTANT



RAY-BAR
USA
Security, Ballistic Glass and IGU's
US: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.raybar.com

NGA

Vetrotech Saint-Gobain Fire-Rated Glass and Framing

2108 B St. NW, Ste. 110
Auburn, WA 98001
Phone: 888/803-9533
E-mail: vetrotech.sales@saint-gobain.com
www.vetrotechusa.com

ADV
NGA

Oldcastle BuildingEnvelope®

More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

ADV
NGA



SAFTI FIRST™ Fire Rated Glazing
100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com

ADV
NGA



Technical Glass Products
8107 Bracken Place SE
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com

ADV
NGA

BURGLARY RESISTANT



RAY-BAR
USA
Security, Ballistic Glass and IGU's
US: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.raybar.com

NGA

Oldcastle BuildingEnvelope®

More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

ADV
NGA

CHEMICALLY STRENGTHENED



Precision Glass Bending Corp.
P.O. Box 1970
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)

ADV
NGA

COLOR COATED

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

DECORATIVE

Go to category DECORATIVE GLASS

DISTRIBUTORS



Coniston Products
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com



GGI
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



ADV

SGC International Inc.
6489 Corvette Street
Commerce, CA 90004
US: 866/802-8682
Phone: 323/318-2998
Fax: 323/318-2999
E-mail: sgccjames@yahoo.com; hennysgc@gmail.com
www.sgc-usa.com
(See our ad on page 69)

FIRE-RATED



GGI
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



ADV



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com



McGRORYGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



RAY-BAR
USA
Fastest Fire Glass and IGU's Available
Phone: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.FireProofGlass.com

NGA



SAFTI FIRST™ Fire Rated Glazing
100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com

ADV
NGA



Technical Glass Products
8107 Bracken Place SE
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com

ADV
NGA

Vetrotech Saint-Gobain Fire-Rated Glass and Framing

2108 B St. NW, Ste. 110
Auburn, WA 98001
Phone: 888/803-9533
E-mail: vetrotech.sales@saint-gobain.com
www.vetrotechusa.com

ADV
NGA

FIRE-RATED: IMPACT RESISTANT



McGRORYGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com

NGA

RAY BAR

RAY-BAR
USA
Fastest Fire Glass and
IGU's Available
Phone: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.FireProofGlass.com



SAFTI FIRST™ Fire Rated Glazing

100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com



Technical Glass Products

8107 Bracken Place SE
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com



FLOORS



SAFTI FIRST™ Fire Rated Glazing

100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com



McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

GLARE REDUCING, FINISHED

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

HANDRAILS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

Oldcastle BuildingEnvelope*
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States.
US: 866-OLDCASTLE
(653-2278)



HEAT SOAKED



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@glassfabUSA.com
www.GlassfabUSA.com

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

Oldcastle BuildingEnvelope*
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States.
US: 866-OLDCASTLE
(653-2278)



HEAT-STRENGTHENED



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@glassfabUSA.com
www.GlassfabUSA.com

Oldcastle BuildingEnvelope*
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States.
US: 866-OLDCASTLE
(653-2278)



INSULATING

*Go to category INSULATING
GLASS, PRODUCTS,
COMPONENTS & EQUIPMENT*

LAMINATED

*Go to category LAMINATED
GLASS & EQUIPMENT*

LEAD

Amerope Enterprises Inc. **NGA**
150 Commerce Rd.
Boynton Beach, FL 33426
US: 800/327-3320
Phone: 561/737-7370
Fax: 561/737-3721
E-mail: claire@amerope.com
www.amerope.com



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

RAY BAR

RAY-BAR
USA
Fastest X-Ray Glass
and IGU's Available
US: 800/444-XRAY
Fax: 800/333-XRAY
E-mail: sales@raybar.com
www.raybar.com



LOW-EMISSION

Oldcastle BuildingEnvelope*
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States.
US: 866-OLDCASTLE
(653-2278)



LOW IRON



Coniston Products
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com



GGI
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



Oldcastle BuildingEnvelope*
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States.
US: 866-OLDCASTLE
(653-2278)



OVERSIZED



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@glassfabUSA.com
www.GlassfabUSA.com

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

PATTERNED



Coniston Products
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com



McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

Oldcastle BuildingEnvelope*
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States.
US: 866-OLDCASTLE
(653-2278)



GGI
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



POINT-SUPPORTED SYSTEMS

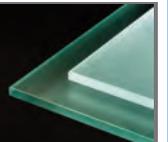
Oldcastle BuildingEnvelope*
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States.
US: 866-OLDCASTLE
(653-2278)



CRYSTAL ULTRA CLEAR GLASS

SGC Low iron glass products are the perfect
choice for beauty and energy efficiencies

Ultra Clear Low Iron Glass



- Ultra Clear Low Iron Glass
- Low Iron Satin Etched Glass
- Low Iron Copper Free Mirror
- Flat Tempered Glass
- Bent Tempered Glass
- Safety Laminated Glass
- Anti-reflective Coated Glass
- Low-e Coated Glass
- Digital Printing Glass
- Silkscreened Glass
- Insulated Glass Units



www.sgc-usa.com
Tel: (323) 318-2998; 1-866-802-8682
Fax: (323) 318-2999 email:sgciusa@gmail.com

PRIVACY: ELECTRICALLY SWITCHABLE

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

SECURITY

RAY BAR

RAY-BAR
USA
Security, Ballistic Glass
and IGU's
US: 800/444-9729
Phone: 800/333-9729
E-mail: sales@raybar.com
www.raybar.com

SAFTI FIRST™ Fire Rated Glazing **ADV**
100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com

Suppliers Guide

The World Leader
in Custom Fabricated

BENT GLASS

• SAFETY TEMPERED • INSULATING
• ANNEALED • SAFETY LAMINATED
• HEAT-STRENGTHENED

Radius or Irregular Bends
Sizes up to 96" x 130"
1/8" to 3/4" Thickness

Architectural, Interior,
Solar & Transport



Precision Glass Bending

(800) 543-8796 • FAX (800) 543-8798
www.e-bentglass.com
Guardian SunGuard Select™ Fabricator



PRELCO

Prelco Inc.
94 Cartier Blvd.
Riviere-du-Loup, GQ G5R 2M9
Canada
US: 800/463-1325
Phone: 418/862-2274
Fax: 418/862-8181
E-mail: sales@prelco.ca
www.prelco.ca

TEMPERED

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com



PRELCO

Prelco Inc.
94 Cartier Blvd.
Riviere-du-Loup, GQ G5R 2M9
Canada
US: 800/463-1325
Phone: 418/862-2274
Fax: 418/862-8181
E-mail: sales@prelco.ca
www.prelco.ca

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States. **ADV**
US: 866-OLDCASTLE (653-2278) **NGA**
www.obe.com

TRANSLUCENT

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

VARIABLE WIRED



Coniston Products
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com

RAY BAR

RAY-BAR **NGA**
USA
Fastest Fire Glass and
IGU's Available
Phone: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.FireProofGlass.com

X-RAY SHIELDING

Amerope Enterprises Inc. **NGA**
150 Commerce Rd.
Boynton Beach, FL 33426
US: 800/327-3320
Phone: 561/737-7370
Fax: 561/737-3721
E-mail: claire@amerope.com
www.amerope.com



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com



McGRORYGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

RAY BAR

RAY-BAR **NGA**
USA
Fastest X-Ray Glass
and IGU's Available
US: 800/444-XRAY
Fax: 800/333-XRAY
E-mail: sales@raybar.com
www.raybar.com



Technical Glass Products **ADV**
8107 Bracken Place SE **NGA**
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com

BATH ENCLOSURES & RELATED ITEMS

GENERAL



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com



American Shower Door **NGA**
6920 E. Slauson Ave.
Commerce, CA 90040
US: 800/421-2333
Phone: 323/726-2478
Fax: 323/726-7469
E-mail: sales@americanshowerdoor.com
www.americanshowerdoor.com

ENCLOSURES: CURVED

Precision Glass Bending

Precision Glass Bending Corp. **ADV**
P.O. Box 1970 **NGA**
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)

ENCLOSURES: GLASS STALLS



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States. **ADV**
US: 866-OLDCASTLE (653-2278) **NGA**
www.obe.com

HARDWARE



Frameless Hardware Company
4361 Firestone Blvd.
South Gate, CA 90280
US: 888/295-4531
Fax: 323/336-8307
E-mail: info@fhc-usa.com
www.fhc-usa.com

CURVED GLASS CREATIONS

Quality Service Since 1946

SPECIALIZING IN:

-LAMINATED SAFETY GLASS
-HEAT STRENGTHENED
-INSULATED UNITS
-ANNEALED
-EXPEDITED LEAD TIMES

FROM STOCK CURIO CABINET GLASS TO
SPIRAL STAIRCASE GLASS
WE DO IT ALL

www.CurvedGlassCreations.com
Toll Free (888) 288-9129
Fax (954) 917-0040

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States. **ADV**
US: 866-OLDCASTLE (653-2278) **NGA**
www.obe.com

SHOWER DOORS

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3
Australian States. **ADV**
US: 866-OLDCASTLE (653-2278) **NGA**
www.obe.com

BENT GLASS

GENERAL

Cristacurva
4822 Southerland Rd.
Houston, TX 77092-3024
Phone: 866/827-6049
Fax: 866/833-0906
E-mail: sales@cristacurva.com
www.cristacurva.com
(See our ad on page 71)

Curved Glass Creations
4100 Powerline Rd., Ste. T-2
Pompano Beach, FL 33073
US: 888/288-9129
Phone: 954/917-0039
Fax: 954/917-0040
E-mail: info@curvedglasscreations.com
www.curvedglasscreations.com
(See our ad on this page)



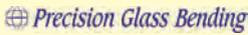
Precision Glass Bending Corp. **ADV**
P.O. Box 1970 **NGA**
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)



Standard Bent Glass Corp.
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com



BENT/CURVED GLASS



Precision Glass Bending Corp. ADV NGA
P.O. Box 1970
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)

DECORATIVE



Standard Bent Glass Corp.
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com



INSULATING



Precision Glass Bending Corp. ADV NGA
P.O. Box 1970
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)



Standard Bent Glass Corp.
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com



LAMINATED



Precision Glass Bending Corp. ADV NGA
P.O. Box 1970
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)



Standard Bent Glass Corp.
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com



SAFETY



Precision Glass Bending Corp. ADV NGA
P.O. Box 1970
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)



SPANDREL



Precision Glass Bending Corp. ADV NGA
P.O. Box 1970
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)



TEMPERED/LAMINATED



Precision Glass Bending Corp. ADV NGA
P.O. Box 1970
3811 Hwy. 10 West
Greenwood, AR 72936-1970
US: 800/543-8796
Phone: 479/996-8065
Fax: 800/543-8798
E-mail: sales@e-bentglass.com
www.e-bentglass.com
(See our ad on page 70)



Standard Bent Glass Corp.
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com



COMPUTER SOFTWARE

ACCOUNTING

Mainstreet Computers Inc. ADV
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail: sales@mainstreetcomp.com
www.mainstreetcomp.com



BUSINESS

Mainstreet Computers Inc. ADV
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail: sales@mainstreetcomp.com
www.mainstreetcomp.com



CALL CENTERS

Mainstreet Computers Inc. ADV
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail: sales@mainstreetcomp.com
www.mainstreetcomp.com



CAPACITY PLANNING



Optima North America Inc. NGA
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail: sales@optima-america.com
www.optima-america.com



ESTIMATING



Optima North America Inc. NGA
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail: sales@optima-america.com
www.optima-america.com



GDS Storefront Estimating NGA
2033 San Elijo Ave. #21
Cardiff by the Sea, CA 92007
Phone: 858/538-4375
Fax: 858/538-4376
E-mail: sales@gdsestimating.com
www.gdsestimating.com
(See our ad on page 72)

FABRICATION



Optima North America Inc. NGA
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail: sales@optima-america.com
www.optima-america.com



GLASS CUTTING



Optima North America Inc. NGA
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail: sales@optima-america.com
www.optima-america.com



INSULATING GLASS



Optima North America Inc. NGA
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail: sales@optima-america.com
www.optima-america.com





CRISTACURVA
ADVANCED TECHNOLOGY GLASS

Curved Glass & Specialty



- Curved
- Structural
- Safety
- Over-sized
- Digital Printing
- Silkscreened
- Insulated Units

✉ sales@cristacurva.com

Toll Free: 1-866-827-6049

www.cristacurva.com

INVENTORY



Optima North America Inc. NGA
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail: sales@optima-america.com
www.optima-america.com



Mainstreet Computers Inc. ADV
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail: sales@mainstreetcomp.com
www.mainstreetcomp.com



INVOICING



Optima North America Inc. NGA
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail: sales@optima-america.com
www.optima-america.com



Suppliers Guide



Fenestration software made simple

EASILY CREATE

- Drawings • Reports
- Quotes • Cut Sheets

FREE TRIAL

858.538.4375
gdsestimating.com/try

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail:
sales@mainstreetcomp.com
www.mainstreetcomp.com

MEASURE SHEET

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail:
sales@mainstreetcomp.com
www.mainstreetcomp.com

MOBILE TECH APP

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail:
sales@mainstreetcomp.com
www.mainstreetcomp.com

OPTIMIZATION



Optima North America Inc. **NGA**
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail:
sales@optima-america.com
www.optima-america.com

PAYMENT PROCESSING

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail:
sales@mainstreetcomp.com
www.mainstreetcomp.com

POINT OF SALE

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail:
sales@mainstreetcomp.com
www.mainstreetcomp.com

PRICING



Optima North America Inc. **NGA**
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail:
sales@optima-america.com
www.optima-america.com

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail:
sales@mainstreetcomp.com
www.mainstreetcomp.com

PRODUCTION



Optima North America Inc. **NGA**
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail:
sales@optima-america.com
www.optima-america.com

QUALITY CONTROL



Optima North America Inc. **NGA**
7860 Grenache, Ste. 200
Montreal, QC H1J 1C3
Canada
Phone: 514/645-8998
Fax: 514/645-8558
E-mail:
sales@optima-america.com
www.optima-america.com

SCHEDULING

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail:
sales@mainstreetcomp.com
www.mainstreetcomp.com

DECORATIVE GLASS

GENERAL



McGRORYGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



Oldcastle BuildingEnvelope* **ADV NGA**
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com



Standard Bent Glass Corp. **ADV NGA**
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com

ACID ETCHED



Coniston Products **ADV NGA**
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com



GGI **ADV NGA**
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



McGRORYGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

CERAMIC FRIT: COLORED



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com

Oldcastle BuildingEnvelope* **ADV NGA**
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

CERAMIC FRIT: PATTERNED

Oldcastle BuildingEnvelope* **ADV NGA**
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

COLOR COATED

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

DECORATIVE INTERLAYERS



Interlayer Solutions Inc. **ADV NGA**
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail:
info@interlayersolutions.com
www.interlayersolutions.com

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



Standard Bent Glass Corp. **ADV NGA**
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com

DICHROIC

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

DIGITAL DIRECT PRINTING



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com



GGI **ADV NGA**
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com

Oldcastle BuildingEnvelope* **ADV NGA**
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com



Standard Bent Glass Corp. **ADV NGA**
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com

LAMINATED



Coniston Products **ADV NGA**
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
E-mail: sales@conistonproducts.com
www.conistonproducts.com

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



Standard Bent Glass Corp.
P.O. Box 469
Butler, PA 16003-0469
US: 800/634-9252
Phone: 724/287-3747
Fax: 724/283-9836
www.standardbent.com



PAINTED

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com



GGI
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



SAFETY

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

TEXTURED

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

DOOR HARDWARE & RELATED PRODUCTS

GENERAL

JLM Wholesale Inc. **NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

Strybuc Industries **NGA**
2006 Elmwood Ave.
Building 102-C
Sharon Hill, PA 19079-0767
US: 800/352-0800
Phone: 610/534-3200
Fax: 610/534-3202
E-mail: cservice@strybuc.com
www.strybuc.com



ACCESS CONTROL

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

BARN DOOR

Calusa Glass Industries
7006 SW 46th St. Miami
FL 33155
Phone: 800/759-9895
Fax: 305/740-6221
E-mail: calusaglass@aol.com
www.calusabarndoorhardware.com
(See our ad on this page)

BUMPERS

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

CLOSING DEVICES

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

DEADBOLTS

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

HINGES

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

KICK PLATES

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

LATCHES

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

LOCKS

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

OPENING DEVICES

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

PANIC DEVICES

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

PIVOTS

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

PUSH/PULL

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

SLIDING GLASS DOOR



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

STOPS & HOLDERS

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

SWEEPS

JLM Wholesale Inc. **ADV NGA**
3095 Mullins Ct.
Oxford, MI 48371
US: 800/522-2940
Phone: 248/628-6440
Fax: 800/782-1160
E-mail: sales@jlmwholesale.com
www.jlmwholesale.com

VISION PANEL FRAMES



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com



RAY-BAR **NGA**
USA
Fastest Fire Glass and IGU's Available
Phone: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.FireProofGlass.com

DOORS & RELATED PRODUCTS

GENERAL



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com



Some of the finishes available are:

- Gold Plated
- Satin Brass
- Black Matte
- Polished Stainless Steel
- Satin Stainless Steel
- Oil Rubbed Bronze

www.calusabarn
doorhardware.com
800-759-9895

ALUMINUM

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

BALCONIES: HIGH-RISE BUILDINGS

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

BIFOLD

Solar Innovations® Architectural Glazing Systems **ADV NGA**
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

Come To The Source!

For Bi-fold Doors

Also available:

- Custom and Stock Doors
- Windows
- Stock Lengths
- Custom Entrances



REBCO INCORPORATED

TEL: (973) 684-0200 • FAX: (973) 684-0118
(800) 777-0787 • www.REBCOinc.com
1171-1225 Madison Ave., Paterson, NJ 07509-2248



GLASSOPOLIS
We Put Glass Contractors First
Fast Quotes, Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com

RAY BAR

RAY-BAR USA
Fastest Fire Glass and IGU's Available
Phone: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.FireProofGlass.com



SAFTI FIRST™ Fire Rated Glazing
100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safiti.com
www.safiti.com



Technical Glass Products
8107 Bracken Place SE
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com

Vetrotech Saint-Gobain Fire-Rated Glass and Framing
2108 B St. NW, Ste. 110
Auburn, WA 98001
Phone: 888/803-9533
E-mail: vetrotech.sales@saint-gobain.com
www.vetrotechusa.com

FOLDING

Solar Innovations® Architectural Glazing Systems
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

GLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

INSULATING GLASS

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

PIVOT

Solar Innovations® Architectural Glazing Systems
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

RAILINGS



Frameless Hardware Company
4361 Firestone Blvd.
South Gate, CA 90280
US: 888/295-4531
Fax: 323/336-8307
E-mail: info@fhc-usa.com
www.fhc-usa.com

SECURITY

RAY BAR

RAY-BAR USA
Security, Ballistic Glass and IGU's
US: 800/444-9729
Fax: 800/333-9729
E-mail: sales@raybar.com
www.raybar.com

SECURITY GLAZING

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

SLIDING GLASS

Solar Innovations® Architectural Glazing Systems
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

STOREFRONTS & ENTRANCES

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

REBCO Inc.
1171-1225 Madison Ave.
Paterson, NJ 07509-2248
US: 800/777-0787
Phone: 973/684-0200
Fax: 973/684-0118
E-mail: sales@REBCOinc.com
www.REBCOinc.com
(See our ad on page 74)

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com

Vetrotech Saint-Gobain Fire-Rated Glass and Framing
2108 B St. NW, Ste. 110
Auburn, WA 98001
Phone: 888/803-9533
E-mail: vetrotech.sales@saint-gobain.com
www.vetrotechusa.com

TEMPERED GLASS DOORS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States.
US: 866-OLDCASTLE (653-2278)
www.obe.com



SAFTI FIRST™ Fire Rated Glazing
100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safiti.com
www.safiti.com

FILMS/COATINGS

ARCHITECTURAL

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

DECORATIVE



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail: info@interlayersolutions.com
www.interlayersolutions.com



McGroryGLASS

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

ELECTICALLY SWITCHABLE

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

SAFETY & SECURITY



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail: info@interlayersolutions.com
www.interlayersolutions.com

WATER RESISTANT PROTECTIVE



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail: info@interlayersolutions.com
www.interlayersolutions.com

**GLASS HANDLING,
PACKAGING & STORAGE**

CRANES



Microcranes, Inc.
10000 NE 7th Ave Ste 330-A
Vancouver, WA 98685
Phone: (360) 768-5104
Fax: (360) 326-7228
Email: info@microcranes.com
Website: www.smartrigcranes.com

HANDLING EQUIPMENT



Ergo Robotic Solutions
P.O. Box 503 **ADV**
Glens Falls, NY 12801
Phone: 518/796-2179
E-mail: j.nudi@ergorobotic.com
ErgoRobotic.com
(See our ad on this page)

**GLASS TOOLS
& SUPPLIES**

GENERAL



Frameless Hardware Company
4361 Firestone Blvd.
South Gate, CA 90280
US: 888/295-4531
Fax: 323/336-8307
E-mail: info@fhc-usa.com
www.fhc-usa.com

BITS: DIAMUT



Diamut America
4110 Meadow Oak Drive
Charlotte, NC 28208
877/9 DIAMUT
Phone: 877/934-2688
E-mail: tooling@diamut.com
www.diamut.com

Glassline Corp.

28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com



IGP Tools
1477 Connelly Springs Rd. **NGA**
Lenoir, NC 28645
US: 800/438-7542
Phone: 828/728-5338
Fax: 828/728-9613
E-mail: c.osborne@igptools.com
www.igptools.com

COOLANT



IGP Tools
1477 Connelly Springs Rd. **NGA**
Lenoir, NC 28645
US: 800/438-7542
Phone: 828/728-5338
Fax: 828/728-9613
E-mail: c.osborne@igptools.com
www.igptools.com

DRILLS



Diamut America
4110 Meadow Oak Drive
Charlotte, NC 28208
877/9 DIAMUT
Phone: 877/934-2688
E-mail: tooling@diamut.com
www.diamut.com

**POLISHING
COMPOUNDS**



IGP Tools
1477 Connelly Springs Rd. **NGA**
Lenoir, NC 28645
US: 800/438-7542
Phone: 828/728-5338
Fax: 828/728-9613
E-mail: c.osborne@igptools.com
www.igptools.com

TAPES



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail:
info@interlayersolutions.com
www.interlayersolutions.com

WHEELS: DIAMUT



Diamut America
4110 Meadow Oak Drive
Charlotte, NC 28208
877/9 DIAMUT
Phone: 877/934-2688
E-mail: tooling@diamut.com
www.diamut.com

Glassline Corp.

28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com



IGP Tools
1477 Connelly Springs Rd. **NGA**
Lenoir, NC 28645
US: 800/438-7542
Phone: 828/728-5338
Fax: 828/728-9613
E-mail: c.osborne@igptools.com
www.igptools.com

WHEELS: POLISHING



Diamut America
4110 Meadow Oak Drive
Charlotte, NC 28208
877/9 DIAMUT
Phone: 877/934-2688
E-mail: tooling@diamut.com
www.diamut.com



IGP Tools
1477 Connelly Springs Rd. **NGA**
Lenoir, NC 28645
US: 800/438-7542
Phone: 828/728-5338
Fax: 828/728-9613
E-mail: c.osborne@igptools.com
www.igptools.com

**INSULATING GLASS
PRODUCTS, COMPONENTS &
EQUIPMENT**

GENERAL



Coniston Products
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com

Erdman Automation

1603 S. 14th St. **ADV**
Princeton, MN 55371
US: 866/376-6177
Phone: 763/389-9475
Fax: 763/389-9757
E-mail:
eac@erdmanautomation.com
www.erdmanautomation.com



GGI **ADV**
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com

McKeegan Equipment & Supply **ADV**

8411 Ronda Dr.
Canton, MI 48187
Phone: 734/459-5870
Fax: 734/459-9837
E-mail:
sales@mckeeganequip.com
www.mckeeganequip.com



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3 **ADV**
Australian States. **NGA**
US: 866-OLDCASTLE
(653-2278)
www.obe.com



Prelco Inc.
94 Cartier Blvd.
Riviere-du-Loup, GQ 5R 2M9
Canada
US: 800/463-1325
Phone: 418/862-2274
Fax: 418/862-8181
E-mail: sales@prelco.ca
www.prelco.ca

AIR SPACERS

Helima Helvetion International Inc
P.O. Box 1348 **NGA**
Duncan, SC 29334-1348
US: 800/346-6628
Phone: 864/439-6600
Fax: 864/439-6065
E-mail: tmccall@helimasc.com
www.helima.de

**AIR SPACERS:
WARM EDGE**

Helima Helvetion International Inc
P.O. Box 1348 **NGA**
Duncan, SC 29334-1348
US: 800/346-6628
Phone: 864/439-6600
Fax: 864/439-6065
E-mail: tmccall@helimasc.com
www.helima.de



The GM 2000-26

Set
2000 lb.
glass 26'
high, with
control &
precision.

34" wide
to fit
through
a 3' door!



518-796-2179
j.nudi@ergorobotic.com
ErgoRobotic.com

EQUIPMENT: OVENS

Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolar technologies.com
www.cassosolar technologies.com

**Automate Your Screen Cleaning
& Emulsion Removing**



**A.W.T. Glass Screen Cleaning
& Reclaiming Systems**

Automotive ■ Architecture ■ Appliance
Decorative ■ Electronics

773.777.7100 ■ sales@awtworldtrade.com
www.glassprintingequipment.com

Suppliers Guide

MUNTIN BARS

Helima Helvetion International Inc
P.O. Box 1348 **NGA**
Duncan, SC 29334-1348
US: 800/346-6628
Phone: 864/439-6600
Fax: 864/439-6065
E-mail: tmccall@helimasc.com
www.helima.de

UNITS: DOUBLE

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3 **ADV**
Australian States. **NGA**
US: 866-OLDCASTLE
(653-2278)
www.obe.com

UNITS: TRIPLE

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3 **ADV**
Australian States. **NGA**
US: 866-OLDCASTLE
(653-2278)
www.obe.com

INTERIOR OFFICE PARTITIONS

DEMOUNTABLE

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3 **ADV**
Australian States. **NGA**
US: 866-OLDCASTLE
(653-2278)
www.obe.com

LAMINATED GLASS & EQUIPMENT

GENERAL

Amerope Enterprises Inc. **NGA**
150 Commerce Rd.
Boynton Beach, FL 33426
US: 800/327-3320
Phone: 561/737-7370
Fax: 561/737-3721
E-mail: claire@amerope.com
www.amerope.com



Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail:
info@interlayersolutions.com
www.interlayersolutions.com



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3 **ADV**
Australian States. **NGA**
US: 866-OLDCASTLE
(653-2278)
www.obe.com



Prelco Inc.
94 Cartier Blvd.
Riviere-du-Loup, GQ G5R 2M9
Canada
US: 800/463-1325
Phone: 418/862-2274
Fax: 418/862-8181
E-mail: sales@prelco.ca
www.prelco.ca

EQUIPMENT: AUTOCLAVE



Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com

EQUIPMENT: AUTOMATED

Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com

EQUIPMENT: NON-AUTOCLAVE



Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com

EQUIPMENT: OVENS & PRESSES



Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com

EQUIPMENT: VACUUM SYSTEMS



Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com

GLASS CLAD POLYCARBONATE

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3 **ADV**
Australian States. **NGA**
US: 866-OLDCASTLE
(653-2278)
www.obe.com

HURRICANE GLASS

SAFTI FIRST™ Fire Rated Glazing **ADV**
100 N. Hill Dr., Ste. 12 **NGA**
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safiti.com
www.safiti.com

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and
Distribution Locations in 25 US
States, 4 Canadian Provinces, 3
European Countries and 3 **ADV**
Australian States. **NGA**
US: 866-OLDCASTLE
(653-2278)
www.obe.com

INTERLAYER



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail:
info@interlayersolutions.com
www.interlayersolutions.com

MIRRORS

Go to category **MIRRORS &
RELATED PRODUCTS**

NON-REFLECTIVE: CLEAR

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

POLYCARBONATE LAMINATES



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail:
info@interlayersolutions.com
www.interlayersolutions.com

SAFETY



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail:
info@interlayersolutions.com
www.interlayersolutions.com

WIRED



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery
Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com

MACHINERY & EQUIPMENT

GENERAL



Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com

Erdman Automation **ADV**
1603 S. 14th St.
Princeton, MN 55371
US: 866/376-6177
Phone: 763/389-9475
Fax: 763/389-9757
E-mail:
eac@erdmanautomation.com
www.erdmanautomation.com

ASSEMBLY

Mueller TB Technologies AG
Laubisruetistrasse 72
CH-8712 Staefa **NGA**
Switzerland
Phone: 905/427-3400
Fax: +41-44-926-6774
E-mail: info@ejindustries.ca
www.mueller.ch

BENDING



Casso-Solar Technologies **ADV**
506 Airport Executive Park **NGA**
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail:
sales@cassosolartechnologies.com
www.cassosolartechnologies.com

BEVELING



Lattuada North America Inc. **ADV**
6967 Wales Rd., Ste. F
Northwood, OH 43619
Toll Free: 844/243-4486
Phone: 567/249-4486
E-mail: info@lattuada-na.com
www.lattuada-na.com

CENTRIFUGE

Glassline Corp.
28905 Glenwood Rd. **NGA**
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com

CNC CUTTING

Eastman®

Eastman Machine Company **NGA**
779 Washington St.
Buffalo, NY 14203
US: 800/872-5571
Phone: 716/856-2200
Fax: 716/856-1140
E-mail: sales@eastmancuts.com
www.eastmancuts.com

COATING



Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

CUTTING

Glassline Corp. **NGA**
28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com

DECORATING



Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

DIGITAL TEMPLATES



Prodim USA
7454 Commercial Circle
Fort Pierce, FL 34951
888/229-3328
Phone: 772/465-4000
Fax: 772/465-8700
E-mail: info@prodimusa.com
www.prodim-systems.com

DRILLING



Lattuada North America Inc. **ADV**
6967 Wales Rd., Ste. F
Northwood, OH 43619
Toll Free: 844/243-4486
Phone: 567/249-4486
E-mail: info@lattuada-na.com
www.lattuada-na.com

Glassline Corp. **NGA**
28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com

DRYING



Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

Glassline Corp. **NGA**
28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com

EDGING



Lattuada North America Inc. **ADV**
6967 Wales Rd., Ste. F
Northwood, OH 43619
Toll Free: 844/243-4486
Phone: 567/249-4486
E-mail: info@lattuada-na.com
www.lattuada-na.com

Glassline Corp. **NGA**
28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com

FURNACES

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

GRINDING & POLISHING



Lattuada North America Inc. **ADV**
6967 Wales Rd., Ste. F
Northwood, OH 43619
Toll Free: 844/243-4486
Phone: 567/249-4486
E-mail: info@lattuada-na.com
www.lattuada-na.com

HEATING ELEMENTS

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

INSPECTION SYSTEMS

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

INSULATING GLASS

Go to category **INSULATING GLASS PRODUCTS, COMPONENTS & EQUIPMENT**

LAMINATING

Go to category **LAMINATING GLASS & EQUIPMENT**

LASERS: MARKING

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

LEHRs

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

PAINTING

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

PHOTOVOLTAIC PANEL EQUIPMENT MFG. SYSTEMS

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

SCREEN PRINTING

AWT World Trade Inc.
4321 N. Knox Ave.
Chicago, IL 60641
Phone: 773/777-7100
Fax: 773/777-0909
E-mail: sales@awt-gpi.com
www.awt-gpi.com
(See our ad on page 75)

Glassline Corp. **NGA**
28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com

SEAMING

Glassline Corp. **NGA**
28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com

SPRAYING

Casso-Solar Technologies **ADV NGA**
506 Airport Executive Park
Nanuet, NY 10954
Phone: 845/354-2010
Fax: 845/547-0328
E-mail: sales@cassosolartechnologies.com
www.cassosolartechnologies.com

TEMPERING



Xinglass (Hangzhou Glass Technology Co., Ltd.) **NGA**
8831 Blue Royale Ln.
Fairfax, VA 22031
US: 800/868-0307
Phone: 302/489-9583
Fax: 302/231-2195
E-mail: sales@xinglassamerica.com
www.xinglass.com
www.xinglassamerica.com

Jordong Glass Machinery **NGA**
6320 NW 99th Ave.
Doral, FL 33178
US: 800/833-2159
Phone: 305/482-0116
Fax: 305/482-0119
www.jordonglass.com

WASHING



Lattuada North America Inc. **ADV**
6967 Wales Rd., Ste. F
Northwood, OH 43619
Toll Free: 844/243-4486
Phone: 567/249-4486
E-mail: info@lattuada-na.com
www.lattuada-na.com

Jordan Glass Machinery
MACHINES IN STOCK NOW!

- Laminated Glass Cutting Machines
- Glass Wrappers
- Glass Polishers
- Drilling Machines

Wheels, Drill Bits & More

Jordan Glass
Jordonglassmachinery
(305) 482-0116 - sales@jordonglass.com

WATER JET CUTTING

Glassline Corp. **NGA**
28905 Glenwood Rd.
P.O. Box 147
Perrysburg, OH 43552
Phone: 419/666-5942
Fax: 419/666-1549
E-mail: sales@glassline.com
www.glassline.com



Stylmark Inc. **NGA**
6536 Main St. NE
Minneapolis, MN 55432
Phone: 800/328-2495
Phone: 763/574-7474
Fax: 763/574-1415
E-mail: info@stylmark.com
www.stylmark.com

METAL PRODUCTS

GENERAL



Niles Aluminum Products **NGA**
1434 S. 9th St.
P.O. Box 607
Niles, MI 49120-0607
Phone: 269/683-1191
Fax: 269/683-8664
E-mail: jeff@nilesaluminum.com
www.nilesaluminum.com

Suppliers Guide

ALUMINUM EXTRUSIONS



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com



Stylmark Inc.
6536 Main St. NE **NGA**
Minneapolis, MN 55432
US: 800/328-2495
Phone: 763/574-7474
Fax: 763/574-1415
E-mail: info@stylmark.com
www.stylmark.com

BENDING EXTRUSIONS



Niles Aluminum Products **NGA**
1434 S. 9th St.
P.O. Box 607
Niles, MI 49120-0607
Phone: 269/683-1191
Fax: 269/683-8664
E-mail: jeff@nilesaluminum.com
www.nilesaluminum.com

METALS: ARCHITECTURAL



Niles Aluminum Products **NGA**
1434 S. 9th St.
P.O. Box 607
Niles, MI 49120-0607
Phone: 269/683-1191
Fax: 269/683-8664
E-mail: jeff@nilesaluminum.com
www.nilesaluminum.com

METALS: CURVING



Niles Aluminum Products **NGA**
1434 S. 9th St.
P.O. Box 607
Niles, MI 49120-0607
Phone: 269/683-1191
Fax: 269/683-8664
E-mail: jeff@nilesaluminum.com
www.nilesaluminum.com



Stylmark Inc.
6536 Main St. NE **NGA**
Minneapolis, MN 55432
US: 800/328-2495
Phone: 763/574-7474
Fax: 763/574-1415
E-mail: info@stylmark.com
www.stylmark.com

MIRRORS & RELATED PRODUCTS

GENERAL



Coniston Products **NGA**
326 Clay Rd.
Sunnyvale, TX 75182
US: 855/484-5277
Phone: 604/952-6092
Fax: 604/952-6093
Email: sales@conistonproducts.com
www.conistonproducts.com



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com

ACID ETCHED

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

ANTIQUE



GGI **ADV**
101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com

DETECTION/SAFETY & SECURITY

McGrory Glass Inc.
1400 Grandview Ave.
Paulsboro, NJ 08066
Phone: 800/220-3749
Fax: 856/579-3233
E-mail: sales@mcgrory.com
www.mcgrory.com

WARDROBE DOORS



Stylmark Inc.
6536 Main St. NE **NGA**
Minneapolis, MN 55432
US: 800/328-2495
Phone: 763/574-7474
Fax: 763/574-1415
E-mail: info@stylmark.com
www.stylmark.com

PERSONAL PROTECTIVE EQUIPMENT

GENERAL



Stylmark Inc.
6536 Main St. NE **NGA**
Minneapolis, MN 55432
US: 800/328-2495
Phone: 763/574-7474
Fax: 763/574-1415
E-mail: info@stylmark.com
www.stylmark.com

PROTECTIVE GUARDS & BARRIERS

GENERAL

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

POINT-OF-PURCHASE DIVIDERS: GLASS/ACRYLIC

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

SNEEZE GUARDS

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

TRANSACTION SYSTEMS

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

SEALANTS & ADHESIVES

SILICONE



Frameless Hardware Company
4361 Firestone Blvd.
South Gate, CA 90280
US: 888/295-4531
Fax: 323/336-8307
E-mail: info@fhc-usa.com
www.fhc-usa.com

SERVICES

METAL BENDING



Niles Aluminum Products **NGA**
1434 S. 9th St.
P.O. Box 607
Niles, MI 49120-0607
Phone: 269/683-1191
Fax: 269/683-8664
E-mail: jeff@nilesaluminum.com
www.nilesaluminum.com

TRAINING PROGRAMS



Interlayer Solutions Inc.
6440 Boul. Henri Bourassa E.
Montreal, QC H1G 5W9 Canada
US: 855/873-1404
Phone: 514/326-4003
Fax: 514/326-9982
E-mail: info@interlayersolutions.com
www.interlayersolutions.com

WEB SERVICES

Mainstreet Computers Inc. **ADV**
330 Charles St.
Belleville, MI 48111
US: 800/698-6246
Phone: 734/699-0025
Fax: 734/697-8228
E-mail: sales@mainstreetcomp.com
www.mainstreetcomp.com

SKYLIGHTS & OVERHEAD GLAZING

GENERAL



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@GlassfabUSA.com
www.GlassfabUSA.com



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

Solar Innovations® Architectural Glazing Systems **ADV NGA**
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

COMMERCIAL

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

CONSERVATORIES

Solar Innovations® Architectural Glazing Systems **ADV NGA**
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

CUSTOM

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**
US: 866-OLDCASTLE (653-2278)
www.obe.com

Solar Innovations® Architectural Glazing Systems **ADV NGA**
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

OPENING ROOF SYSTEMS

Solar Innovations® Architectural Glazing Systems **ADV NGA**
31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

SLOPED GLAZING SYSTEMS

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com

SOLAR GREENHOUSES

Solar Innovations® Architectural Glazing Systems **ADV NGA**

31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

SUNROOMS

Solar Innovations® Architectural Glazing Systems **ADV NGA**

31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

SPECIALTY GLASS PRODUCTS

GENERAL



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery **ADV NGA**

Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com

WOOD STOVE REPLACEMENT



Glassopolis
We Put Glass Contractors First
Fast Quotes. Fast Delivery **ADV NGA**

Phone: 800/262-9600
Fax: 800/872-9601
E-mail: sales@glassopolis.com
www.glassopolis.com



Technical Glass Products **ADV NGA**

8107 Bracken Place SE
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com

STOREFRONTS & CURTAINWALLS

GENERAL



Glassfab Tempering Services **ADV**
1448 Mariani Ct.
Tracy, CA 95304
US: 800/490-3860
Phone: 209/229-1060
Fax: 209/229-1061
E-mail: info@glassfab.usa.com
www.glassfab.usa.com



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com

CURTAINWALLS



SAFTI FIRST™ Fire Rated Glazing **ADV NGA**

100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com



Technical Glass Products **ADV NGA**

8107 Bracken Place SE
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com

CURTAINWALLS: UNITIZED

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com

CURTAINWALLS: WOOD

Solar Innovations® Architectural Glazing Systems **ADV NGA**

31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

FOLDING GLASS WALLS

Solar Innovations® Architectural Glazing Systems **ADV NGA**

31 Roberts Rd.
Pine Grove, PA 17963
US: 800/618-0669
Phone: 570/915-1500
Fax: 570/915-6083
E-mail: skylight@solarinnovations.com
www.solarinnovations.com

ENTRANCES: CUSTOM



GGI **ADV**

101 Venture Way
Secaucus, NJ 07094
US: 800/431-2042
Phone: 201/553-1850
Fax: 201/553-1851
E-mail: sales@generalglass.com
www.generalglass.com

REBCO Inc.

1171-1225 Madison Ave.
Paterson, NJ 07509-2248
US: 800/777-0787
Phone: 973/684-0200
Fax: 973/684-0118
E-mail: sales@REBCOinc.com
www.REBCOinc.com
(See our ad on page 74)

MUNTIN GRIDS

Bacon & Van Buskirk **NGA**

801 S. Neil St.
Champaign, IL 61820
US: 800/747-6471
Phone: 217/356-6471
Fax: 217/352-7267
E-mail: info@bamuntins.com
www.bamuntins.com
(See our ad on this page)

SECURITY GLAZING

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com

STOREFRONTS & ENTRANCES



SAFTI FIRST™ Fire Rated Glazing **ADV NGA**

100 N. Hill Dr., Ste. 12
Brisbane, CA 94005-1010
US: 888/653-3333
Phone: 415/824-4900
Fax: 415/824-5900
E-mail: info@safti.com
www.safti.com

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com



Technical Glass Products **ADV NGA**

8107 Bracken Place SE
Snoqualmie, WA 98065
Phone: 800/426-0279
Fax: 800/451-9857
E-mail: sales@fireglass.com
www.fireglass.com

WINDOW HARDWARE & RELATED PRODUCTS

GENERAL

Strybuc Industries **NGA**

2006 Elmwood Ave.
Building 102-C
Sharon Hill, PA 19079-0767
US: 800/352-0800
Phone: 610/534-3200
Fax: 610/534-3202
E-mail: cservice@strybuc.com
www.strybuc.com

SHIMS

Grove Structural Shims **ADV NGA**

17 Marguerite Ave.
P.O. Box 240
Leominster, MA 01453
US: 800/72-GROVE(47683)
Phone: 978/534-5188
Fax: 978/840-4130
E-mail: sales@groveproductsinc.com
www.groveproductsinc.com

WINDOWS

GENERAL



Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com

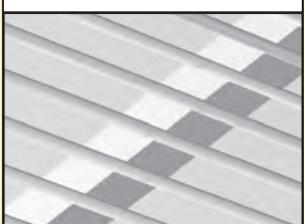
BACON'S ARCHITECTURAL



MUNTINS

Custom Extruded Aluminum Applied
Muntin Grids for Storefront and Curtainwalls

www.bamuntins.com



SUNSHADES

Horizontal Louver Brise Soleil SunShades
for Storefront and Curtainwall

www.basshades.com

ALUMINUM

Liberty Glass & Metal Industries

339 Riverside Dr.
N. Grosvenordale, CT 06255
Phone: 800/843-2031
Fax: 860/923-9662
E-mail: info@lgm.net
www.lgminc.net
(See our ad on page 80)

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com

ARCHITECTURAL

Oldcastle BuildingEnvelope®
More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278)

www.obe.com

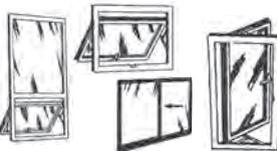
Suppliers Guide

Liberty Glass & Metal Industries 

Toll free: 800-843-2031
 Fax: 860-923-9662
 www.lgminc.net

Fast-Track Program

2" Projected Window Systems Specifically Designed for Commercial Applications



Commercial Rated Windows

BLAST RESISTANT

Oldcastle BuildingEnvelope®
 More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278) 

www.obe.com

SAFTI FIRST™ Fire Rated Glazing **ADV NGA**
 100 N. Hill Dr., Ste. 12
 Brisbane, CA 94005-1010
 US: 888/653-3333
 Phone: 415/824-4900
 Fax: 415/824-5900
 E-mail: info@safiti.com
 www.safiti.com

Vetrotech Saint-Gobain Fire-Rated Glass and Framing **ADV NGA**
 2108 B St. NW, Ste. 110
 Auburn, WA 98001
 Phone: 888/803-9533
 E-mail: vetrotech.sales@saint-gobain.com
 www.vetrotechusa.com

BULLET RESISTANT

RAY BAR

RAY-BAR USA **NGA**
 Security, Ballistic Glass and IGU's Available 

US: 800/444-9729
 Fax: 800/333-9729
 E-mail: sales@raybar.com
 www.raybar.com

SAFTI FIRST™ Fire Rated Glazing **ADV NGA**
 100 N. Hill Dr., Ste. 12
 Brisbane, CA 94005-1010
 US: 888/653-3333
 Phone: 415/824-4900
 Fax: 415/824-5900
 E-mail: info@safiti.com
 www.safiti.com

Vetrotech Saint-Gobain Fire-Rated Glass and Framing **ADV NGA**
 2108 B St. NW, Ste. 110
 Auburn, WA 98001
 Phone: 888/803-9533
 E-mail: vetrotech.sales@saint-gobain.com
 www.vetrotechusa.com

DOUBLE HUNG

Oldcastle BuildingEnvelope®
 More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278) 

www.obe.com

FIRE-RATED

McGRORYGLASS

McGrory Glass Inc.
 1400 Grandview Ave.
 Paulsboro, NJ 08066
 Phone: 800/220-3749
 Fax: 856/579-3233
 E-mail: sales@mcgrory.com
 www.mcgrory.com

RAY BAR

RAY-BAR USA **NGA**
 Fastest Fire Glass and IGU's Available 

Phone: 800/444-9729
 Fax: 800/333-9729
 E-mail: sales@raybar.com
 www.FireProofGlass.com

SAFTI FIRST™ FIRE RATED GLAZING SOLUTIONS

SAFTI FIRST™ Fire Rated Glazing **ADV NGA**
 100 N. Hill Dr., Ste. 12
 Brisbane, CA 94005-1010
 US: 888/653-3333
 Phone: 415/824-4900
 Fax: 415/824-5900
 E-mail: info@safiti.com
 www.safiti.com

TGP FIRE RATED

Technical Glass Products **ADV NGA**
 8107 Bracken Place SE
 Snoqualmie, WA 98065
 Phone: 800/426-0279
 Fax: 800/451-9857
 E-mail: sales@fireglass.com
 www.fireglass.com

Vetrotech Saint-Gobain Fire-Rated Glass and Framing **ADV NGA**
 2108 B St. NW, Ste. 110
 Auburn, WA 98001
 Phone: 888/803-9533
 E-mail: vetrotech.sales@saint-gobain.com
 www.vetrotechusa.com

FIXED

Oldcastle BuildingEnvelope®
 More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278) 

www.obe.com

HURRICANE RESISTANT

Oldcastle BuildingEnvelope®
 More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278) 

www.obe.com

SAFTI FIRST™ Fire Rated Glazing **ADV NGA**
 100 N. Hill Dr., Ste. 12
 Brisbane, CA 94005-1010
 US: 888/653-3333
 Phone: 415/824-4900
 Fax: 415/824-5900
 E-mail: info@safiti.com
 www.safiti.com

Vetrotech Saint-Gobain Fire-Rated Glass and Framing **ADV NGA**
 2108 B St. NW, Ste. 110
 Auburn, WA 98001
 Phone: 888/803-9533
 E-mail: vetrotech.sales@saint-gobain.com
 www.vetrotechusa.com

IMPACT RESISTANT

McGrory Glass Inc.
 1400 Grandview Ave.
 Paulsboro, NJ 08066
 Phone: 800/220-3749
 Fax: 856/579-3233
 E-mail: sales@mcgrory.com
 www.mcgrory.com

TGP FIRE RATED

Technical Glass Products **ADV NGA**
 8107 Bracken Place SE
 Snoqualmie, WA 98065
 Phone: 800/426-0279
 Fax: 800/451-9857
 E-mail: sales@fireglass.com
 www.fireglass.com

SAFTI FIRST™ Fire Rated Glazing **ADV NGA**
 100 N. Hill Dr., Ste. 12
 Brisbane, CA 94005-1010
 US: 888/653-3333
 Phone: 415/824-4900
 Fax: 415/824-5900
 E-mail: info@safiti.com
 www.safiti.com

Vetrotech Saint-Gobain Fire-Rated Glass and Framing **ADV NGA**
 2108 B St. NW, Ste. 110
 Auburn, WA 98001
 Phone: 888/803-9533
 E-mail: vetrotech.sales@saint-gobain.com
 www.vetrotechusa.com

LEAD X-RAY

Amerope Enterprises Inc. **NGA**
 150 Commerce Rd.
 Boynton Beach, FL 33426
 US: 800/327-3320
 Phone: 561/737-7370
 Fax: 561/737-3721
 E-mail: claire@amerope.com
 www.amerope.com



McGRORYGLASS

McGrory Glass Inc.
 1400 Grandview Ave.
 Paulsboro, NJ 08066
 Phone: 800/220-3749
 Fax: 856/579-3233
 E-mail: sales@mcgrory.com
 www.mcgrory.com

RAY BAR

RAY-BAR USA **NGA**
 Fastest X-Ray Glass and IGU's Available 

US: 800/444-XRAY
 Fax: 800/333-XRAY
 E-mail: sales@raybar.com
 www.raybar.com

NUCLEAR SHIELDING

Amerope Enterprises Inc. **NGA**
 150 Commerce Rd.
 Boynton Beach, FL 33426
 US: 800/327-3320
 Phone: 561/737-7370
 Fax: 561/737-3721
 E-mail: claire@amerope.com
 www.amerope.com

McGrory Glass Inc.
 1400 Grandview Ave.
 Paulsboro, NJ 08066
 Phone: 800/220-3749
 Fax: 856/579-3233
 E-mail: sales@mcgrory.com
 www.mcgrory.com

RAY BAR

RAY-BAR USA **NGA**
 Fastest X-Ray Glass and IGU's Available 

US: 800/444-XRAY
 Fax: 800/333-XRAY
 E-mail: sales@raybar.com
 www.raybar.com

SECURITY

RAY BAR

RAY-BAR USA **NGA**
 Security, Ballistic Glass and IGU's Available 

US: 800/444-9729
 Fax: 800/333-9729
 E-mail: sales@raybar.com
 www.raybar.com

SINGLE HUNG

Oldcastle BuildingEnvelope®
 More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278) 

www.obe.com

SPECIALTY

Oldcastle BuildingEnvelope®
 More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **NGA**

US: 866-OLDCASTLE (653-2278) 

www.obe.com

THERMAL BREAK

Oldcastle BuildingEnvelope®
 More Than 85 Manufacturing and Distribution Locations in 25 US States, 4 Canadian Provinces, 3 European Countries and 3 Australian States. **ADV NGA**

US: 866-OLDCASTLE (653-2278) 

www.obe.com

TILT/TURN

Solar Innovations® Architectural Glazing Systems **ADV NGA**
 31 Roberts Rd.
 Pine Grove, PA 17963
 US: 800/618-0669
 Phone: 570/915-1500
 Fax: 570/915-6083
 E-mail: skylight@solarinnovations.com
 www.solarinnovations.com

Reader Response Center

Advertiser	Page	Phone	Website or email address
AWT World Trade Inc.	75	773/777-7100	awt-gpi.com
Azon	17	800/788-5942	azonintl.com
Bacon & Van Buskirk	79	800/747-6471	bamuntins.com
C.R. Laurence	9	800/421-6144	email:crl@crlaurence.com
Calusa Barn Door Hardware	73	800/759-9895	calusabarndoorhardware.com
Cristacurva	71	866/827-6049	cristacurva.com
Curved Glass Distributors	70	888/288-9129	curvedglasscreations.com
Dependable Glass Works	22	800/338-2414	dependableglass.com
Diamon-Fusion International	41		dfisolutions.com
Erdman Automation	7	763/389-9475	erdmanautomation.com
Ergo Robotic Solutions	11, 75	518/796-2179	ergorobotic.com
FeneTech Inc.	37	330/995-2830	fenetech.com
First Choice Building Products	15	800/793-4544	fcbp.com
GDS Estimating	72	858/538-4375	gdsestimating.com
GGI	15A, 59	800/431-2042	generalglass.com
Glass Coatings & Concepts	51	513/539-5300	gcconcepts.com
Glassfab Tempering Services	5	800/490-3860	glassfabusa.com
Glasshape North America	30	206/538-5416	glasshape.com
Grove Shims	83	978/534-5188	groveshims.com
Groves Inc.	28	800/991-2120	groves.com
Guangdong Kin Long Hardware Products Co. Ltd.	16		kinlong.com
HHH Equipment Resources	Cover Tip 1-2	336/201-5396	hhhglassequipment.com
JLM Wholesale	21	800/522-2940	jlmwholesale.com
Jordon Glass Machinery	77	800/833-2159	jordonglass.com
Liberty Glass & Metal Industries	80	800/843-2031	lgminc.net
MyGlassTruck.com	18	800/254-3643	myglasstruck.com
NGA Online Store	63	866/342-5642 ext. 127	glass.org/store
Precision Glass Bending Corp.	27, 70	800/543-8796	e-bentglass.com
Pulp Studio	2	310/815-4999	email: sales@pulpstudio.com
REBCO Inc.	74	800/777-0787	REBCOinc.com
Roto North America	45	800/243-0893	rotonorthamerica.com
SAFTI First	3	888/653-3333	safti.com
Salem Fabrication Supplies	19	336/766-1104	salemftg.com
Satinal	25		email: info@satinal.it
SGC International Inc.	69	866/802-8682	sgc-usa.com
Viracon	57		viracon.com
Vitro Architectural Glass	84		starphireglass.com
Walker Glass	55		walkerglass.com

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

HOW TO SUPPORT WOMEN WORKING IN THE PANDEMIC

Recruiting and retaining a more gender-diverse workforce has been a longtime concern for the glass industry. Now, it is possible the gains that have been made could be threatened by the pandemic. More than a quarter of women are considering leaving the workforce, temporarily or permanently, according to the authors of "Women in the Workplace," a survey-based study conducted by McKinsey & Company and LeanIn.Org which focuses on women in corporate America.

Using data from June to August of 2020, the authors outline the size of the problem, and what can be done to stop this attrition.

Support work/life balance, especially for mothers

Researchers found that mothers are more than three times as likely to be in charge of housework and caregiving during the pandemic. About a third of the mothers surveyed had considered leaving or reducing professional work due to COVID-19, say researchers.

The study authors recommend meeting this new set of circumstances with increased flexibility. Employees have reported difficulty keeping work-life boundaries, especially if they are working from home. Researchers suggest allowing employees to set their own hours and availability, a policy that is best received when managers themselves model and communicate



this flexibility, they say. "When employees believe senior leaders are supportive of their flexibility needs, they are less likely to consider downshifting their careers or leaving the workforce," researchers say.

Offering added time off is also helpful, according to the study, especially for parents. Giving parents the option of time off for school preparation can help ease pressure, they say.

Revise systems and goals to reflect current realities

Research authors also recommend revising work goals and expectations to reflect our new reality. One way is to revisit job benchmarks. "Managers can relieve employees' stress—and refocus on key priorities—by reassessing performance criteria set before the pandemic to make sure those criteria are still attainable," say the authors.

While many companies have also added resources and changed policies to aid employee well-being, such as offering mental health services, study authors

emphasize that companies need to make sure employees actually know about these new benefits.

Remove barriers facing Black women and women of color

The study also offers specific guidance regarding Black women, whom they recognize face distinct and long-standing barriers in the workplace. The study's six years of data confirm that "Black women face more systemic barriers, receive less support from managers, and experience more acute discrimination."

Researchers encourage companies addressing these barriers to be intersectional; that is, to recognize barriers Black women face as a result of both race and gender. "Many corporate diversity efforts focus on either race or gender, which means women of color may end up being overlooked," say researchers. "In contrast, when companies set goals and track outcomes by gender and race combined, they can more clearly see how Black women and other women of color are progressing." ■



GROVE SHIMS™

RUGGED, INEXPENSIVE, AND CONVENIENT LEVELING AND ALIGNMENT AIDS FOR THE GLASS AND CONSTRUCTION INDUSTRY

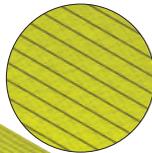
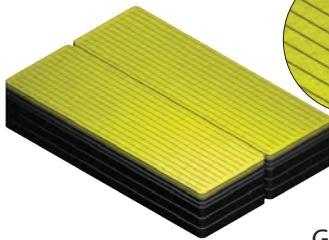
**If you are stuck being dependent on Imports,
we offer our condolences.***

TARIFF FREE*
**16,000 miles from your source, Long Supply Chain,
Long-Term Contracts, Managing Supply Chain Logistics**

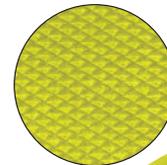
**If you would like to enjoy the benefits of
American-Made Hardware, we offer our services.**



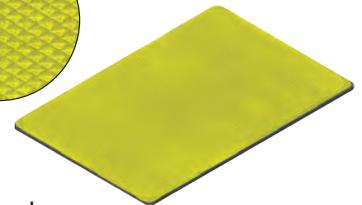
GROVE SHIMS™
RAISED RIB



**Why buy from
any other country?**



GROVE SHIMS™
MICOGRID



Grove Shims™ has the perfect shim for all your shimming needs. With color-coded shims and solid thicknesses, the right shim can be easily applied for perfect alignment. No guesswork or realigning. Our shims save you time and money.

* Contact us about eligible tariff fee reimbursements on the purchase of Grove's shims only.

"This ad applies to U.S. and Canada only. Offer expires 12/31/20"

Need help? Just ask! We're here to help.

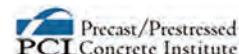
978-534-5188

Visit us online to see all of our available solid 3x4 Shims.

www.groveshims.com

Free Samples are Available Upon Request.

Grove Shims™ is the leading producer of plastic structural shims. We have been in business since 1962, making shims since 1975, our family-owned business provides prompt, personalized attention to each order. In addition to our large line of in-stock shims, we will custom fabricate parts to meet your unique requirements. Unlike many competitors, our shims are solid and do not have hollow voids, so you can depend on them in crucial, load-bearing conditions.



Grove Shims™ • 17 Marguerite Ave • P.O. Box 240 • Leominster, MA 01453, USA

Tel: 978-534-5188 • Fax: 978-840-4130

Email: sales@groveshims.com • www.groveshims.com

THE ULTIMATE BLANK SLATE

Acid-etch it. Backpaint it. Frit it. Digitally print on it.
The design options are endless with *Starphire Ultra-Clear*[®] glass:
the world's purest glass – and the ultimate blank slate for your design.

starphireglass.com


STARPHIRE
ULTRA-CLEAR[®] GLASS


Vitreo[®]
Architectural Glass