

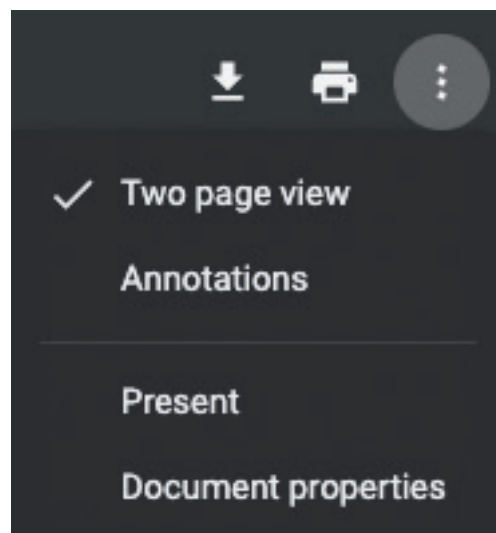
# GLASS MAGAZINE®

THE GLASS AND GLAZING AUTHORITY

GLASSMAGAZINE.COM

## Welcome to the digital edition of Glass Magazine!

To view the issue in a two-page format,  
click the triple dots in the upper right corner  
and select “Two-page view.”



# GLASS

MAGAZINE®

THE GLASS AND GLAZING AUTHORITY • JANUARY/FEBRUARY 2024

GLASSMAGAZINE.COM

ANNUAL FORECAST

# MIXED ECONOMIC SIGNALS

STATE OF  
FLOAT  
PRODUCTION

NGA ANNUAL  
REPORT

OFFICIAL PUBLICATION

**NGA**  
NATIONAL GLASS ASSOCIATION OF AMERICA

GLASS.ORG



# FHC<sup>®</sup> ACHIEVE<sup>®</sup>

FGR FRAMELESS GLASS RAILINGS

U.S. Patent No. 11,613,895 B2

## EFFICIENCY REDEFINED

FAST AND EASY INSTALLATION EVERYTIME

BASE SHOES | CAP RAILS | HANDRAILS | ACCESSORIES

FHC's ACHIEVE<sup>®</sup> FGR Frameless Glass Railing System offers the same performance characteristics of traditional glass railing systems, but with significantly expedited installation. The proprietary dual angle shims and installation tool eliminate the hassle of traditional expansion cements and allow for adjustment and/or removal of the glass.

FHC's ACHIEVE<sup>®</sup> mechanical shim set is a dry attachment system that can be removed as easily as it is installed. Designed and optimized to reduce stress on monolithic and laminated tempered glass, this is the next generation of glass railing systems.



**WINNER**  
Glass Magazine's 2023 Award for  
Best Innovation for Installers



### Next Generation Dry Glaze Railing System

ENGINEERED  
DESIGN  
NOW 40%  
LIGHTER



**FHC<sup>®</sup>**  
FRAMELESS HARDWARE COMPANY

**The Glazing  
Supply Company**

EXPERIENCE AND INNOVATION

(888) 295-4531 | FHC-USA.COM | railing@fhc-usa.com



THINK BIG  
THINK GLASSWERKS™

INSULATED GLASS  
RESIDENTIAL &  
ARCHITECTURAL DOOR

## GLASS STOREFRONT AND ENTRANCE SYSTEMS

Elevate your next project with Glasswerks, your premier destination for top tier glass solutions. Whether it's **residential or architectural**, our insulated glass sets the standard for excellence. Unleash your creativity with our array of offerings, including Custom Hardware, Digital Images, Silk Screening, Miters, Bevels, Holes, & Notching. At Glasswerks, we are more than just a glass fabricator—**we are your dedicated partner**, ensuring that every detail exceeds expectations. Your vision, our craftsmanship—your project, **perfected**.

### COMMERCIAL ENTRANCES & DOORS

- All-Glass Entrance Systems
- Bottom Rolling Door Systems
- Panic Doors & Devices
- Stacking Sliding Doors
- Patch Railing Systems
- Custom Hardware

### CUSTOM FABRICATION

- Up to 3/4" Monolithic Glass
- Laminated Glass
- Miters, Bevels, Holes, & Notching
- Digital Images & Silk Screening
- Patch Railing Systems
- Custom Hardware



GLASSWERKS' GROUP OF COMPANIES

888.789.7810 | [glasswerks@glasswerks.com](mailto:glasswerks@glasswerks.com) | [glasswerks.com](http://glasswerks.com)





# 46



Photo courtesy of Vitro

## FEATURES

### 46. The World of Glass

North American float glass producers explore partnerships with solar panel producers, and stay ahead of the curve with low carbon-products

BY NORAH DICK

### 56. The 2024 Forecast: Top Takeaways

Highlights from the latest construction forecasts reflect a U.S. economy that is shadowed by inflation, higher interest rates, labor challenges and geopolitical risk

BY TARA LUKASIK

## INSIGHTS

### 32. Legal

Third-party Standards Mitigation

BY MATT JOHNSON

### 36. Factory Floor

Five Glass Industry Measurement Challenges

BY DAVE WINARSKI

### 38. Your Profits: Finance

Flexible Strategies for A Shifting Economy

BY MARCO TERRY

## DEPARTMENTS

- 8. Editor's Notes
- 12. From the NGA
- 16. Glass Advocate
- 17. Glass Informational Bulletin
- 22. News to Know
- 74. Product Solution: GGI
- 75. Industry Products
- 78. Suppliers Guide
- 92. Reader Response Center
- 94. Industry Spotlight

**ON THE COVER:** Float glass being processed at Guardian Glass's facility in Czestochowa, Poland. Photo courtesy of Guardian Glass.





# Roto Patio Inowa

Hardware designed for tight-sealing, innovative sliding patio doors

[rotonorthamerica.com](http://rotonorthamerica.com)

Casement & Awning | Sliding Patio | Hinged Patio | Tilt&Turn | Hung & Sliding | Push-out

# ONLINE

AT GLASSMAGAZINE.COM

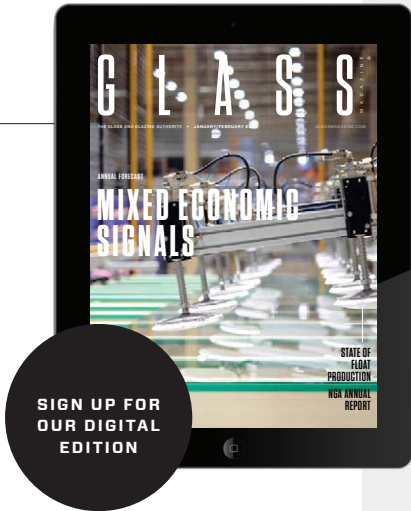
 | [YOUTUBE.COM/GLASSMAGAZINE](https://www.youtube.com/glassmagazine)

 | [TWITTER.COM/GLASSMAG](https://twitter.com/glassmag)

 | [INSTAGRAM.COM/GLASSMAGAZINENGA](https://www.instagram.com/glassmagazinenga)

 | [FACEBOOK.COM/GLASSMAGAZINENGA](https://www.facebook.com/glassmagazinenga)

**Glass Magazine Weekly newsletter and digital edition:** Subscriptions available under the "Subscription Services" tab on GlassMagazine.com



**SIGN UP FOR OUR DIGITAL EDITION**

## BONUS CONTENT

Available at GlassMagazine.com and glass.org.

### METAL TRENDS

Glass and metal systems suppliers adapt their systems for less labor, greater sustainability

### CAREER PATHS

Students explore the diverse world of construction trades, and what NGA has to offer

### RESOURCES

NGA's 80+ Glass Technical Papers cover all aspects of glass and glazing building products

## GLASSBLOG



### ENERGY EFFICIENCY

#### Staying Current with Energy Codes

Lisa May, Wausau Window and Wall Systems



### CODES & STANDARDS

#### ADA Design Considerations

By Mary Avery, Tubelite



### FORECASTS

#### Top 5 Factors to Watch

By Katy Devlin, NGA



## PROJECT SHOWCASE

Featured in Glass Magazine Weekly and on GlassMagazine.com. To submit projects or case studies, write Norah Dick, [ndick@glass.org](mailto:ndick@glass.org). Pictured: The interior of Penn Station in New York City, the busiest train station in the Western Hemisphere, underwent a significant renovation. The design features more than an acre of glass that Pulp Studio fabricated for the

new mid-block canopies that complement the original arched windows of the Farley Building, as well as the interior Moynihan Train Hall. Columns feature mirror-backed glass colored in blue at the bottom to a gradually changing gradient of mirror at the top. Photo: Pulp Studio

Glass Magazine® (ISSN 0747-4261), Volume 74, Number 1, is published eight times annually in January/February, March, April, May/June, July, August, September/October and November/December by the National Glass Association, 344 Maple Ave. West, Unit 272, Vienna, VA 22180; 703/442-4890. There is no charge for subscriptions in the United States for individuals in the trade and/or qualified requestors. 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. ©2024 National Glass Association. All Rights Reserved. Printed in the U.S.A.

# GLASS MAGAZINE

Published by the

**NGA** NATIONAL GLASS ASSOCIATION with GANA

344 Maple Ave. West, Unit 272  
Vienna, VA 22180  
P: 703/442-4890

## EDITORIAL

Content Director  
**Katy Devlin** • [kdevlin@glass.org](mailto:kdevlin@glass.org)

Managing Editor  
**Tara Lukasik**

Associate Director, Comm. & Digital Media  
**Bethany Stough**

Senior Editor  
**Norah Dick**

Digital Media Coordinator  
**Wendy Vardaman**

Assistant Editor & Researcher  
**Rachel Vitello**

Production Director  
**Beth Moorman**

Creative Lead  
**Cory Thacker**

Circulation Manager  
**Jo Ann Binz**  
[jbinz@glass.org](mailto:jbinz@glass.org)

## ADVERTISING

Publisher

**Emily Thompson** • [ethompson@glass.org](mailto:ethompson@glass.org)  
703/442-4890 ext. 150

Senior Sales Consultant

**Chris Hodges** • [chodges@glass.org](mailto:chodges@glass.org)  
703/442-4890 ext. 131 • Cell: 410/459-8619

Sales Consultant

**Tristan Scoffield** • [tscoffield@glass.org](mailto:tscoffield@glass.org)  
703/442-4890 ext. 194

Suppliers Guide Sales

**Tim O'Connell** • [toconnell@glass.org](mailto:toconnell@glass.org)  
703/442-4890 ext. 129

Sales Coordinator

**Cameron Woodell** • [cwoodell@glass.org](mailto:cwoodell@glass.org)

## NGA BOARD OF DIRECTORS (2023-24)

Chair  
**Ron Crowl**  
FeneTech Inc.,  
a Cynclly Company

Chair-Elect  
**Rick Locke**  
Montana Sash & Door

Treasurer  
**Tim Kelley**  
TriStar Glass Inc.

Immediate Past Chair  
**Brian Hale**  
Hale Glass Inc.

**Tara Brummet**  
Vitrum Glass Group

**Jodi Martinez**  
AllStar Glass Co. Inc.

**Jim Stathopoulos**  
Ajay Glass Co.

**Silas Koonse**  
Koonse Glass Co. Inc.

**Syndi Sim**  
Diamon-Fusion  
International

**Kyle Sword**  
Pilkington North  
America

**Courtney Little**  
Ace Glass

President & CEO  
National Glass Association  
**Nicole Harris**



WE NEVER WANT TO BE  
JUST A VENDOR.

WE WANT TO BE  
A PARTNER.



**ERDMAN'S TEAM CELEBRATING OUR LATEST EXPANSION**

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 30 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](http://www.erdmanautomation.com) or call 763-389-9475 for more information.

VISIONARY THINKING. EXCEPTIONAL DOING.





## Mixed Economic Signals



**KATY DEVLIN**  
Content Director  
Editor-in-Chief  
kdevlin@glass.org

In this first edition of Glass Magazine in 2024, we present our Annual Construction Forecast, found on pages 56-68. To pull together the in-depth look at the year ahead, Glass Magazine's Tara Lukasik waded through numerous prognostications from leading construction economists from Dodge Construction Network, the AGC of America, ConstructConnect, the American Institute of Architects, ITR Economics, and others. However, the takeaways are mixed.

### Recession or soft landing

There is little agreement among economists about what 2024 will hold. They are split over whether the overall economy will enter recession—59% of economists say there is a 46% chance the U.S. will enter recession in 2024, according to Bankrate's latest quarterly survey of economists, published in fall 2023. They are split over labor market expectations. Over interest rate projections. Over the future of inflation.

Construction economists are similarly split in their expectations for the coming year. During a presentation at 2023 GlassBuild America, Connor Lokar, senior forecaster, ITR Economics, projected that the overall U.S. economy will most likely enter recession in the coming months, with nonresidential construction beginning to feel the effects in late 2024. However, Richard Branch, chief economist, Dodge Construction Network, expressed confidence

that the U.S. will remain “recession-free” and end 2024 “on much more stable footing.”

### Consensus in construction forecasts

There are some areas of consensus. Most sector economists anticipate a softening in the commercial sector, a significant falloff in multifamily, but a rebound of single family. They also align over expectations for key market drivers, such as supply chains (expected to continue to normalize); material inflation (slowing, with “relief” in sight, says Dodge's Branch); labor (still tight, with wages rising); and interest rates (turning around from their painfully high levels).

### On the ground

Despite what forecasters say about the state of the economy, many in the glass industry say they are already feeling a slowdown in the market. The on-the-ground message I'm hearing from some is that backlogs are generally down. High inflation and interest rates have taken a toll, and credit is becoming less available. Many are looking to 2024 with some concern over the state of projects in the pipeline, their ability to get paid and to manage material cost increases. “Work is slowing down, and some players are getting caught crosswise on inflation,” said one glazier I spoke with in early December.

### Opportunity to focus

Despite the uncertainty, economists note that slowing growth can offer business opportunities. A slowdown will give the construction industry its first “breather” before the pandemic, according to ITR's Lokar. “You'll have an opportunity to get the house in order. You've spent three to three and a half years surviving the pandemic, with unprecedented supply chain issues, inflation pressures and turnover. You're going to be able to breathe. ... Think about everything you've said ‘no’ to over the past two or three years. That's what you can bring back to the front burner.” ■

**“MANY GLAZIERS ARE LOOKING TO 2024 WITH SOME CONCERN OVER THE STATE OF PROJECTS IN THE PIPELINE, THEIR ABILITY TO GET PAID AND TO MANAGE MATERIAL COST INCREASES.”**



# Never Compromise

**Products:**

Como Hinges  
Glass-to-Glass Clamps  
U-Channels  
Square Pull Handles

As the trusted industry leader for over 60 years, you can count on CRL for durable, time-tested products and an unmatched selection of popular finishes.

CRL offers a complete line of **Frameless Shower Hardware:**

- Sliding shower door systems
- Shower door hinges
- Towel bars and grab bars
- Pull handles and knobs
- Headers, support bars, and more



800.421.6144 • [crlaurence.com](http://crlaurence.com)  
[showers@crlaurence.com](mailto:showers@crlaurence.com)







# ERGO ROBOTIC SOLUTIONS

## • ON THE JOB SITE

### **Coast to Coast Sales & Rentals**

*Financing Available*

Tired of breaking your back?  
Wondering how you're going to install  
that big glass?

Need some new muscle on the job?  
Give us a call!



**The GM2000-12** This unit will lift a 2000 pound payload 13 feet into the air and place it using the best articulation in the business. This is the standard by which we compare the others.



**The GM2000-16 with Winch** Adding the optional winch and extending the boom takes this machine to the next level. The winch is useful to install curtainwall from above. It can take 2000 pounds of payload 16 feet into the air all day long.

## Custom Solutions

Do you have a need for a solution?  
Perhaps we can fulfill that need!  
*We design and build machines to  
meet your specific requirements.*



**Call or Email Jerry**  
518-796-2179

ErgoRobotic.com  
j.nudi@ergorobotic.com



**The GL1200** This model is capable of working with a payload 1200 pounds at a height of 13 feet. It falls between the GM800 and the GM2000-12 in capacity, and is very heavy duty.



# • IN THE SHOP



# • AT THE FACTORY



**The GM800 & The GM1200** Both have the functions of the GM2000-12. They lift 800 or 1200 pounds respectively to a height of 10 feet. They have a small turning radius and are relatively light weight. Perfect for the **shop, factory & job site**.



## The Skyhook WPI

Our underhook solution turns a crane hook into a precision instrument capable of hauling up to a massive 3800 lbs. into the sky and delicately placing it using remote control.

For heavier loads and placement under an overhang, we are the experts.

Made in the USA

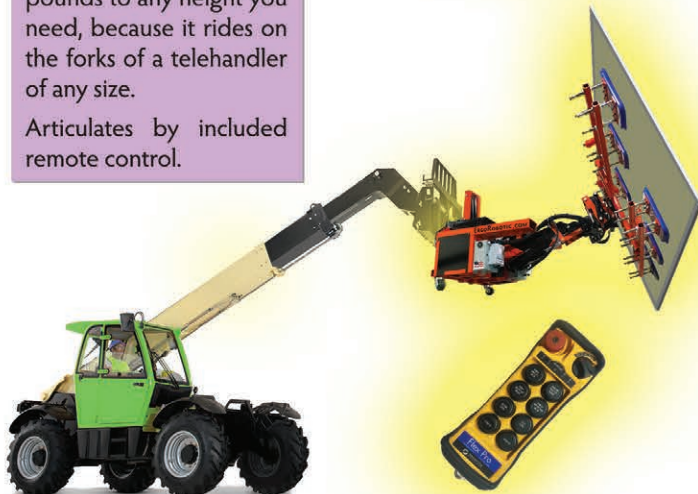


Means Serviceability  
[ErgoRobotic.com](http://ErgoRobotic.com)

## The THOM 2200 & THOM 4000

Lifts 2200 or 4000 pounds to any height you need, because it rides on the forks of a telehandler of any size.

Articulates by included remote control.



## The GM2000-26

This unit is currently our tallest, capable of putting 2000 pounds up 26 feet into the air with articulated accuracy. It has a power extending base for counterweight. It is ideal for setting glass in high places.

# YOUR ASSOCIATION AT WORK

NEED-TO-KNOW INFORMATION  
FROM THE NGA

## GLASSBUILD AMERICA 2023 DRAWS MORE THAN 8,700 TO ATLANTA

GlassBuild America: The Glass, Window & Door Expo returned to the Georgia World Congress Center in Atlanta in October and November, attracting more than 8,700 registered attendees for its 20th year as the largest glass and fenestration industry trade show in the Western Hemisphere.

The three-day event, organized by the National Glass Association, drew attendees from the United States and internationally to see new product solutions, advanced machinery and equipment, innovative tools and components, and more. The 188,300-square-foot show floor included over 480 exhibitors, including international exhibitors, and over 90 first-time exhibitors.

“In Atlanta, we celebrated 20 years of GlassBuild America, delivering on our promise to bring buyers and sellers together for 2.5 days of incredible energy and connection-making,” says NGA

President and CEO Nicole Harris. “Next year, we head to Dallas for the first time, and judging from the exhibitor sign-ups and attendee buzz, GlassBuild America 2024 is looking like another record-breaking show.”

In addition to a busy show floor, GlassBuild also offered a wide range of education opportunities: the 17th Annual Glazing Executives Forum; the Annual Construction Economic Outlook presented by Connor Lokar of ITR Economics; Main Stage sessions, including a gathering of women in glass and fenestration, panels on looming industry trends, mental health and suicide prevention, and building business and community through DEIB; and seismic performance considerations for fenestration and glass, and fenestration product certification from the Fenestration & Glazing Industry Alliance. Finally, a rodeo-themed party to hype GlassBuild 2024 in Dallas closed out the event. ■

## CONSTRUCTION ECONOMIC OUTLOOK

The overall U.S. economy will most likely enter a recession in the coming months, with nonresidential construction beginning to feel the effects in late 2024, says Connor Lokar, senior forecaster, ITR Economics, who returned to the Glazing Executives Forum at GlassBuild to deliver the event’s popular annual economic forecast keynote presentation.

“We anticipate a recession in 2024,” says Lokar, who, for the first time

brought his full-length forecast to the GlassBuild show floor, in a standing-room-only session at the Main Stage. The session was part of NGA’s 75th anniversary celebration. ■



View the forecast

## GEF SPOTLIGHTS BEST PRACTICES

About 200 leaders from glazing contracting firms gathered on Oct. 31, 2023, at the 17th Annual Glazing Executives Forum for a day of education, networking and solutions sharing. This year’s event, hosted by NGA and held in conjunction with GlassBuild America, offered programming to help glaziers tackle some of their biggest ongoing challenges, including finding and keeping employees, managing risks on the job, and handling glass safely amid design trends for larger and more complex products. ■



Read the recap

## INDUSTRY TRENDS TO WATCH

The GlassBuild Main Stage hub for education and industry insights kicked off its three-day schedule on Oct. 31, 2023, with “Industry Trends to Watch,” a seminal panel hosted by Max Perilstein of Sole Source Consultants, Ron Crowl of Cynclly, Shelly Farmer of Sightline Commercial Solutions, Alan Kinder of Guardian Glass, and Bruce Wesner of PGT Innovations. Artificial intelligence was a major topic, and panelists encouraged industry members to think of new tech development as an opportunity. “Play with AI,” said Crowl, encouraging industry members to see how the tool could work for their companies and processes. ■



## MENTAL HEALTH AND SUICIDE PREVENTION

Kristen Petillo, Richard Bright, Cal Breyer and Bob Swanson spoke about mental health, suicide prevention and tough conversations in the construction industry. A culture of “male toughness,” job injuries that lead to opioid dependence, binge drinking and substance abuse all contribute to the high suicide rate within the industry. According to panelists, it’s vital to eliminate the stigma surrounding mental health and suicide. Talk to your friends and family. Open a conversation if you think something’s wrong. ■



## BUILDING BUSINESS AND COMMUNITY THROUGH DEIB

The keynote panel “Building Better Business Through DEIB” featured industry leaders Ann McNeil, chair and founder of the National Association of Black Women in Construction, and Kelsi Queen-Robinson, CEO of Ebony Glass & Mirror. Moderated by NGA Operations Manager Alicia Hamilton, the panel focused on cultivating and maintaining a diverse workforce, and the barriers to success that people of color face in the construction and building industries. ■



## NGA CODE AND REGULATORY UPDATES

NGA energy codes consultant Tom Culp and NGA Advocacy & Technical Services VP Urmilla Sowell presented updates to standards and codes impacting the glass and glazing industry. Culp covered the new Energy Star requirements, embodied carbon and Environmental Product Declarations, building performance standards and stretch codes, and glazing for on-site renewable energy production.

Sowell shared bird-friendly glazing requirements and NGA’s advocacy work, school security and enhanced forced-entry standards, and heat treatment and edge grinding, including NGA’s study on test procedures for edge grinding of laminates post-tempering with research on the thermal performance of spandrel glass. “What can we do as an association to address the rising issue of active shooters in the U.S.?” asks Sowell on school security. “We can address hardening schools. In an active shooter situation, time matters. Changing the codes to account for security and not just safety can make a difference.” ■

## WOMEN ENCOURAGE REPRESENTATION, SUPPORT

In the much-anticipated follow-up to last year’s GlassBuild gathering, the Women in Glass and Fenestration Breakfast Meetup on Nov. 2 focused on representation and building other women up. Colleen Pritchett, president, Aperture Solutions—U.S., Cornerstone Building Brands, identified keys for flexibility and gender diversity in companies during the keynote, Flexibility and Gender Diversity. “Empower women employees through mentorship and supportive culture; give access to education and training; offer flexibility in the workplace, including leave and childcare; and offer unique opportunities, and [encouragement] for women to ask for and go after those opportunities.” ■



## YOUR ASSOCIATION AT WORK

### MYGLASSFAB LAUNCHES

NGA launched its MyGlassFAB training platform for production personnel at GlassBuild, offering demos throughout the show. Powered by NGA’s MyGlassClass.com, MyGlassFAB provides companies with consistent, core training for glass fabrication employees. The new platform combines online courses with skills-based activities to help ensure production personnel have the fundamental skills necessary to perform their duties safely and accurately.

“Consistent training can be a challenge when companies rely primarily on informal, one-one-one instruction,” says Jenni Chase, NGA vice president of workforce development. “MyGlassFAB offers training that fabricators can deploy and track across their entire workforce.” Learn more at [myglassfab.com](http://myglassfab.com). ■

### NEW NGA BOARD OFFICERS

New board officers of the National Glass Association took office for the 2023-24 term on Oct. 30, 2023, prior to the start of GlassBuild America. Board officers are Chair Ron Crowl, FeneTech, a Cyncly Company; Chair-elect Rick Locke, Montana Sash & Door; Treasurer Tim Kelley, TriStar Glass Inc.; and Immediate Past Chair Brian Hale, Hale Glass Inc.

Returning board members are Tara Brummet, Vitrum Glass Group; Silas Koonse, Koonse Glass Co. Inc.; Courtney Little, Ace Glass; Jodi Martinez, AllStar Glass Co. Inc.; Syndi Sim, Diamon-Fusion International; Jim Stathopoulos, Ajay Glass; and Kyle Sword, Pilkington North America. ■

### EVENT UPDATES

NGA will again co-locate the 2024 Building Envelope Contractors Conference and Glass Processing Automation Days—taking place March 3-5 and March 5-6, 2024, respectively—at the Omni Hotel in downtown Nashville, Tennessee. Both events share programming, including a joint session on March 5 addressing supply chain challenges faced together by fabricating and glazing companies. ■

[bvproducts.com](http://bvproducts.com)

## Simulated steel frames.

- ✓ Better lead times than steel framing
- ✓ More cost-effective than steel framing
- ✓ Ideal for luxury residential & commercial projects

*Now seeking independent sales reps!*

**SimSteel**

**BVB**  
Architectural  
Products

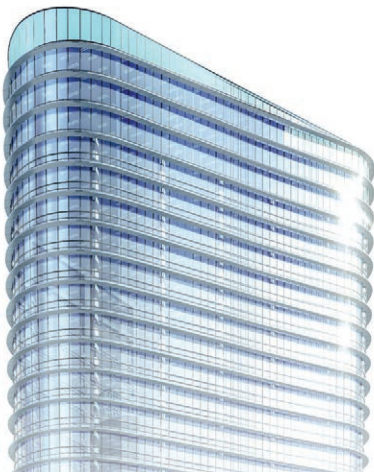


Register today

INTRODUCING THE VIRACON IDENTIFICATION NUMBER (VIN):

# 8 DIGITS OF ABSOLUTE CERTAINTY.

T1465789\_VIRACON\_MN\_IGCC(R)\_IGMA(R)\_2022\_KM52888



**A New Asset Management Tool for Your Glass.** At Viracon, we never stop improving our glass or the customer experience. The Viracon Identification Number (VIN) is further proof of this commitment.

Discreetly printed on the thermal spacer, the VIN is a unique number that contains all the information you need about an insulating unit installed on a building, including glass type, composition, and finished size. With the Viracon Identification Number, the number of reasons to choose Viracon keeps growing. Learn more at [Viracon.com/VIN](https://Viracon.com/VIN).





# GLASS ADVOCATE

## Resources for Glass and Glazing Professionals

The National Glass Association offers Glass Technical Papers (GTPs) free for the industry on a wide range of topics pertaining to the commercial/residential glass and residential window and door industries. GTPs are developed by NGA's dedicated member volunteers and subject matter experts. Below, we present the second half of the list of all GTP titles available. The first half of the list appeared in the November/December 2023 issue of Glass Magazine.

FB46-15 (2022) Assessment of the Weatherability and Durability of Decorative Glass

FB47-15 (2021) Considerations When Installing Interior-Mounted Back-Painted Glass

FB48-15 (2020) Effects of Moisture, Solvents and Other Substances on Laminated Glazing Edges

FB49-17 (2022) Performance Improvements of IGUs

FB50-17 (2022) Building Energy Performance

FB51-17 (2022) Building Envelope Commissioning

FB52-17 (2022) Guidelines for the Production of Heat-Treated Architectural Flat Glass

FB53-17 Benefits of Decorative Glass in Daylighting Applications

FB54-17 (2022) Guidelines and Best Practices on How to Manage Color Variance of Decorative Glazing

FB55-17 LEED® White Paper - Decorative

FB56-18 Heat Soak Testing

FB57-18 One Optical Number Does Not Fit All

FB58-18 (2023) Understanding Reflective Distortion in Mirror Installations

FB59-18 Heat-Treated Laminated Glass Exposed Edges

FB60-18 (2023) Understanding Reflected Solar Energy of Glazing Systems in Buildings

FB61-19 Tornado-Resistant Glazing

FB62-19 Mitigating Thermal Stress Breakage in Heat-Treated Spandrel Glass

FB63-19 Products for Energy Applications

FB65-20 Glass for Personal Protective Barriers

FB66-20 Introduction to Vacuum Insulating Glazing

FB67-20 Guidelines on How to View Decorative Glazing Products in Interior and Exterior Applications

FB68-20 Guidelines for Measuring Color of Decorative Glazing Materials in the Field

FB70-20 Best Practices for Installed Painted Decorative Glass

FB71-21 School Security Glazing

FB72-21 Introduction to Hybrid VIG Fabrication

FB73-22 Types of Decorative Glass

FB74-22 Alignment in US Energy Conservation Codes ASHRAE 90.1 and IECC

FB75-23 Compatibility Testing of Insulating Glass PIB Primary Sealant with Respect to Glazing Materials

FB76-23 Fire-Rated Glazing 101

FM01-08 (2020) Approximate Weight of Architectural Flat Glass

FM02-07 (2017) Flat Glass Industry Standards

FM02-09 (2020) Protecting Glass Against Weld Splatter

FM03-10 (2023) LEED® Recycled Content for Glass

FM04-12 (2019) Daylighting

FM05-12 (2023) Physical and Mechanical Properties of Typical Soda Lime Float Glass

FM06-20 General EPD Education

FM07-21 Flat Glass Environmental Transparency Documents

IN01-06 (2020) The Top 10 Items Commonly Missing from Fenestration System Shop Drawings

IN02-09 (2022) Bid Considerations for Contract Glazing Proposals

IN03-12 (2023) Key Elements of Fenestration System Shop Drawings

IN04-14 (2020) Safety Guidelines for Deglazing Structural Silicone

IN05-17 (2022) Overview of Building Information Modeling (BIM) for Glass and Glazing Systems

TB-1601-95(14) Guidelines for Use of Capillary Tubes

TB-1250-19 PIB Primary Sealant



ALL GTPs ARE FREE TO DOWNLOAD IN NGA'S ONLINE STORE.



# GLASS INFORMATIONAL BULLETIN

## Heat-Treated Glass Surfaces Are Different: Learn the Process, Properties and Cleaning Procedures

Heat-treated glass is a critical component of high-performance coated, insulating, laminated, spandrel, safety glazing, bullet-resistant, blast-resistant and hurricane-resistant fenestration products. Heat-treated glass usage has increased in recent years as a result of changes in the building codes requiring safety glazing in more applications, the need to meet higher thermal stress loads due to the use of more high-performance glass and coatings with increased heat absorbing and/or reflecting properties, larger glass sizes, and increased design loads.

### Heat-strengthened, fully tempered

There are two types of heat-treated glass as defined in ASTM International's C1048 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass. The two types are heat-strengthened and fully tempered.

### Heat-treatment process

Both types of heat-treated glass are produced using the same equipment, typically horizontal roller hearth ovens



using either a batch or continuous process. To prepare annealed glass for the heat-treatment process, it is cut to the required final size, the edges are treated according to the specified finish (commonly seamed or polished) and the glass is washed. The glass is then transported on horizontal rollers through an oven, where it is heated to approximately 1150 degrees Fahrenheit (621 degrees Celsius). Upon exiting the oven, the glass is rapidly cooled (quenched) by blowing air uniformly

Acceptable cleaning procedures are available free from the National Glass Association and the International Window Cleaners Association.



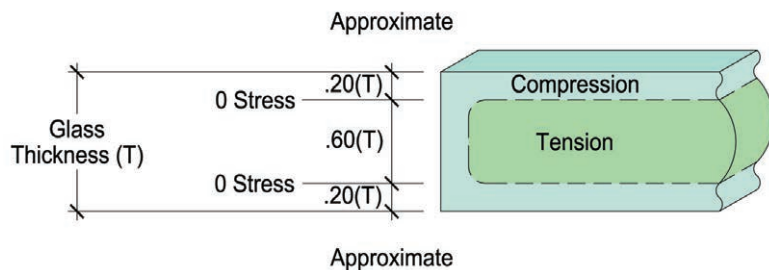
Proper Procedures for Cleaning Architectural Glass Products



Construction Site Protection and Maintenance of Architectural Glass



## GLASS INFORMATIONAL BULLETIN—HEAT-TREATED GLASS SURFACES ARE DIFFERENT



**Fig. 1** — The heat-treatment process heats glass to approximately 1150 degrees Fahrenheit (621 degrees Celsius). Upon exiting the oven, the glass is rapidly cooled (quenched) by blowing air uniformly on both surfaces simultaneously. The cooling process leaves the surfaces of the glass in a state of compression and the central core in compensating tension.

onto both surfaces simultaneously. The cooling process leaves the surfaces of the glass in a state of compression, and the central core in compensating tension (see Figure 1).

### Properties of heat-treated glass

The color, clarity, chemical composition, light transmission, hardness, specific gravity, expansion coefficient, softening point, thermal conductivity, solar optical properties and stiffness remain unchanged by the heat-treating process. The properties that change are improved flexural and tensile strength and resistance to thermal stresses and shock. Under uniform loading, heat-treated glass is stronger than annealed glass of the same size and thickness. The heat-treating process will change the break pattern of glass that has been treated to a higher level of compressive stress, i.e., fully tempered glass that is designed to meet the industry safety glazing standards will break into relatively small pieces, thereby greatly

reducing the likelihood of serious cutting or piercing injuries.

### Heat-treated glass surfaces

The heat-treating process typically involves the transport of very hot glass on rollers. As a result of this soft glass-to-roller contact, some glass surface changes will occur. Minute glass particles (fines) from the glass cutting, edging and washing processes; typical manufacturing plant airborne debris or dust; refractory particles from the tempering oven roof; and external airborne dirt and grit carried into the plant by the large volumes of quench air used in the process may adhere to one or both glass surfaces. Also, the physical contact of the soft glass surface with the rollers may result in a marking or dimpling of the glass surface.

Glass quality specifications contained in ASTM C1036 Standard Specification for Flat Glass establish the size and number of glass imperfections allowed based on specific visual inspection criteria.

The glass surface conditions described above are not usually visible to the eye under normal viewing, do not threaten the product's structural integrity and are not a reason for rejection of the glass based on the industry ASTM consensus standards.

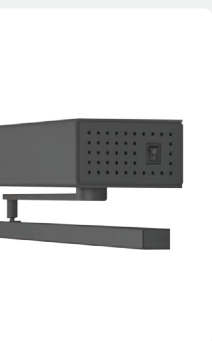
However, such surface conditions may be detectable to the touch despite being invisible. This difference in "feel" between annealed and heat-treated glass can lead to issues during cleaning of the glass, as glass cleaning workers attempt to remove microscopic particles. With the best intentions, they may attempt to scrape particles that can be felt but not seen and may end up scratching and chipping the glass surface.

Additionally, once the glass is delivered to the construction site and/or installed, construction materials and debris may be deposited on the glass surface. Paint, stucco, concrete, adhesives and other materials may be splattered on the glass and left for long periods of time.

### How to clean heat-treated glass

The recommended cleaning procedures for heat-treated glass are identical to those for annealed glass. Scrapers, abrasives and harsh chemical cleaning agents are not recommended for any glass product because they can cause irreparable damage. Despite the best intentions, window cleaners may attempt to remove construction dirt and debris from the glass surface by scraping the surface. This can lead to glass damage, such as scratching and chipping, if microscopic particles adhering to the surface become dislodged and are transported across the glass surface during the scraping process. ■

# EVERYTHING DOOR HARDWARE





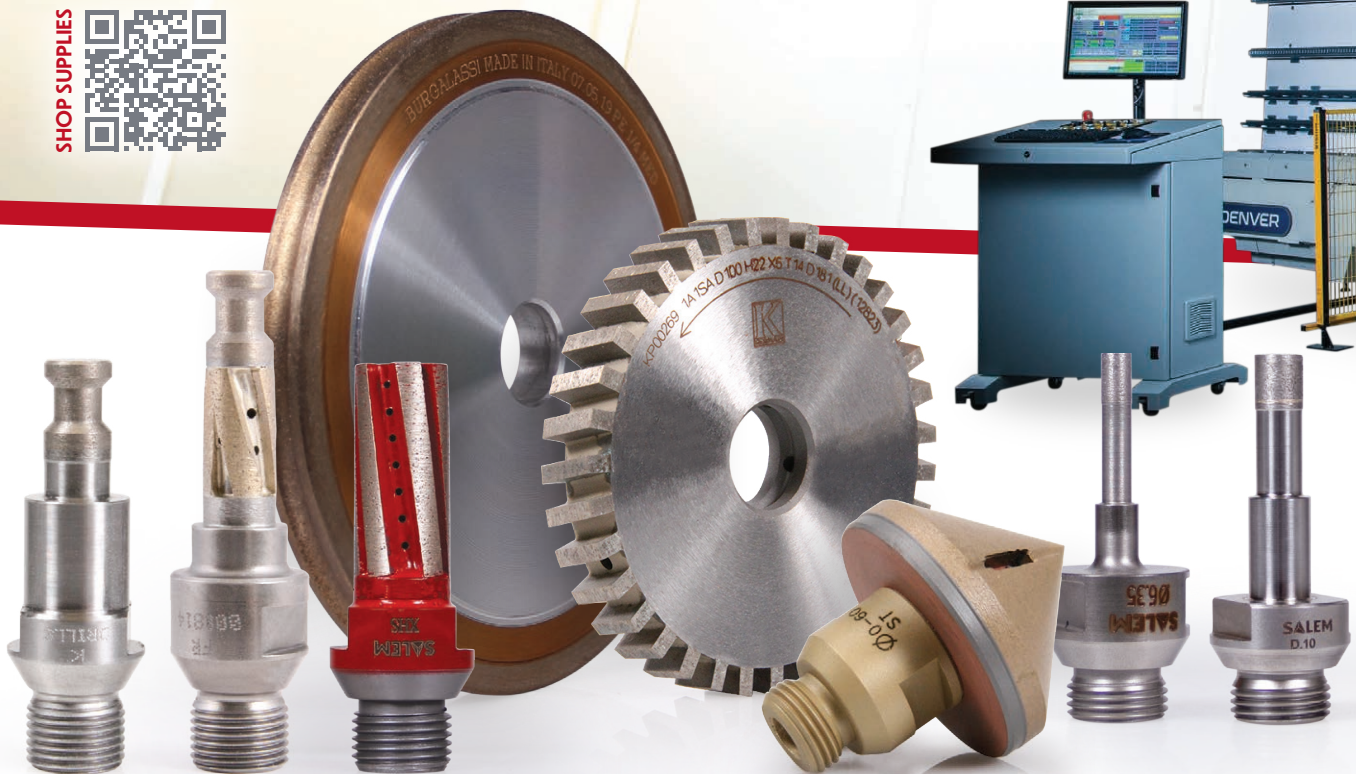


# PROVEN RESULTS

## Premium Tooling for CNC Machinery

**Salem Fabrication Supplies** stands out from the rest in our methods of selecting, inspecting, testing and developing only the best products. **CONTACT US TODAY** and ask about our full line of premium tooling for CNC machinery –including **peripheral wheels, router bits, countersinks and core drills.**

SHOP SUPPLIES



800.234.1982

Salem Fabrication Supplies  
info@salemftg.com  
www.SalemFTG.com

HHH Equipment Resources  
info@hhhglassequipment.com  
HHHGlassEquipment.com



## Denver Advance Elite Vertical CNC Work Center

**HHH Equipment Resources** brings you the **Denver Advance Elite**. This zero set up vertical CNC work center has 100% uptime with its continuous "Flow" configuration and is capable of edging, notching, countersinking and polishing.

The **Advance Elite** also offers new **D-Shaping** capabilities –allowing you to work fully shaped glass sheets without straight parts.

**CONTACT US TODAY** and ask about all our machinery solutions.



SEE MACHINES





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

## **Vitro Architectural Glass Rescales Operations at PA Plant to Meet First Solar Contract Demand, Expands MSVD Coating Capabilities**

Vitro Architectural Glass and First Solar, a U.S.-based solar panel manufacturer, expanded their contract. This expansion aims to provide the glass front sheets used in advanced thin-film photovoltaic solar panels manufactured by First Solar.

Considering the requirements of this expansion, Vitro will invest an estimated \$180 million to upgrade one of its furnaces at the Meadville plant, located in Pennsylvania, and adapt additional existing facilities to support First Solar's growing manufacturing capacity in the U.S.

As a result, Vitro announced that it will temporarily idle one of its raw-glass production lines at its Carlisle, Pennsylvania, plant in the first quarter of 2024, affecting approximately 90 positions.

After the first line is shut down, it will be reconfigured to produce solar panel glass for First Solar. Line 2 at Carlisle will continue manufacturing various products for Vitro's commercial and residential glass customers.

Vitro's plants are strategically located to meet First Solar's needs and already have the required raw materials for production. Production is expected to commence in the first quarter of 2026.

To meet a growing demand for magnetron-sputtered vacuum deposition products in North America, Vitro Architectural Glass also launched a new MSVD coater, Coater 8, at its Mexicali facility in Baja California, Mexico. The unit will apply Vitro's solar control low-emissivity coatings to architectural, automotive and oversized glass in sizes up to 130 by 240 inches.

The MSVD coating process enables glass manufacturers to apply ultra-thin layers of silver to glass to create low-e coatings that deflect solar energy and transmit high daylight levels.

## **AGC Successfully Demonstrates Glass Production Using Hydrogen as Fuel and Test of Solar Glass Recycling**

AGC announced that it has succeeded in a demonstration test of glass production using hydrogen as fuel. This is AGC Group's first conducted test using hydrogen in an actual production furnace.

In this test, AGC verified the technological issues for utilizing hydrogen-fueled oxygen combustion technology in glass production, including glass quality, effects on furnace materials, flame temperature, furnace temperature and nitrogen oxide emissions control. Aiming for full-scale deployment, AGC will conduct scaled-up tests of the combustion capacity of the hydrogen combustion burner and consider demonstration tests at AGC Group's global sites to determine the scope of application of hydrogen combustion technology.

AGC also announced that it has succeeded in a demonstration test for the first time in Japan to recycle about 24 tons of used solar panel cover glass into raw material cullet.

The test was conducted at AGC Yokohama Technical Center's figured glass production furnace. For the recovery of glass from solar panels, the test used the heat-treatment technology of the commercial solar panel recycling production line of Mitsubishi Chemical Group company Shinryo Corp.

## **NSG Solar Glass Production Begins in Malaysia**

NSG Group announced the warm-up of a newly converted, transparent, conductive oxide facility in Malaysia. In this investment, an existing float line at the Johor Bahru factory of Malaysian Sheet Glass SDN BHD, a member of NSG Group, has been converted to begin producing TCO glass. This investment supports First Solar's expansion strategy, which has a long-standing strategic partnership with NSG Group. The float line will supply glass to First Solar's Southeast Asia manufacturing footprint.

## **PGT Innovations Establishes Glass Company, Western Window Systems Unveils Design Studio**

PGT Innovations established Triple Diamond Glass, a PGT Innovations company. Triple Diamond Glass will offer solutions to window and door manufacturers in energy efficiency, security and sound-abatement applications. The initial products to be produced include Tri-Ultra thin-triple insulating glass units and Diamond Glass laminated glass units. The operations for Triple Diamond Glass will be housed in a facility in Prince George, Virginia, just south of Richmond.

The company's products will be available for window and door manufacturers to incorporate into their existing products by the end of the first quarter of 2024.

Western Window Systems, part of the PGT Innovations family of brands, recently unveiled its new architectural design studio in California. Located in Santa Monica, the new 2,800-square-foot architectural design studio doubles as a showroom, and will serve as an



## A CELEBRATION OF ARTISTIC INGENUITY

**St. Petersburg, Florida is renowned for its vibrant art scene, featuring over 600 street murals.** GGI contributed to this artistic landscape by fabricating 32 custom glass panels for a new public art display for the SunRunner Bus Rapid Transit system. As part of a \$44 million project to enhance the city, nationally recognized artist Catherine Woods was commissioned to design 16 art installments to be placed in bus shelters across a 10-mile corridor, capturing the essence of the surrounding neighborhoods. **Having worked with GGI on past projects, Woods knew GGI could bring her visions to life with Alice® Direct to Glass Printing.**

### ***SunRunner Bus Rapid Transit Stations***

Artwork by  
Catherine Woods

Commissioned by  
Pinellas Suncoast  
Transit Authority  
and the City of  
St. Petersburg, Florida

Photography courtesy of  
Catherine Woods

 800-431-2042  [sales@generalglass.com](mailto:sales@generalglass.com)  [www.generalglass.com](http://www.generalglass.com)

©2023. All rights reserved. Alice® Direct to Glass Printing is a registered trademark of GGI.

SEE WHAT  
**GLASS  
CAN DO**  
**GGI**





**MyGlassTruck.com**  
America's Glass Rack Leader



## Innovative engineering. Superior features. Quality manufacturing.

Our glass transport equipment is the #1 choice of glass professionals throughout the United States and beyond.

### All Racks Feature:

- Strong Aluminum Construction
- Aircraft-Grade Fasteners
- Most Glass Protection Padding
- Fuel Efficient - Large Payload
- Designed and Built In The U.S.A



All racks ship fully assembled with step-by-step installation instructions.



Turnkey glass trucks built to order and in-stock for fast delivery.

Call Today for More Info and a Quote  
**1-844-364-4022**



Top Quality Glass Racks & Truck Bodies Since 1989

### NEWS TO KNOW

innovation hub and immersive experience for architects, builders, developers, dealers and interior designers. Inside, visitors can see the operation of products and experience the latest product innovations. Western Window Systems industry partners will also be able to use the space as an extension of their showrooms and introduce homeowners to more than 18 of the brand's products.

The design studio is available for customers to visit by appointment only with an architect or dealer.

### HMI Closes West Coast Locations

HMI has decided to close its West Coast locations due to the current labor shortages and changes in the shower glass market in these regions. HMI facilities in Cerritos and Livermore, California, and Reno, Nevada, are closed. The company says that this is a strategic decision that allows it to streamline its operations, strengthen its infrastructure and focus on those areas of the country that it can support with certainty.

HMI currently has locations in Louisville, Kentucky; Whitinsville, Massachusetts; Arlington, Texas; Spokane, Washington; and Aiea, Hawaii.

### IGE Collaborates with Digital Printing Manufacturer KeraJet

IGE Glass Technologies announced a new collaboration with KeraJet S.A., a digital printing manufacturer based in Valencia, Spain. IGE will serve as KeraJet's exclusive North American distributor for their digital printing technology in the flat glass fabrication industry.

### Lisec Opens Engineering Center

A new engineering center opened at the Lisec site in Seitenstetten, Austria. The company added around 140 additional workplaces to an area of 21,500 square feet and four floors. Construction work began in April 2022. More than \$7.5 million was invested in the construction project. Trends in office spaces, such as collaboration spaces or shared desks, were incorporated into the design.

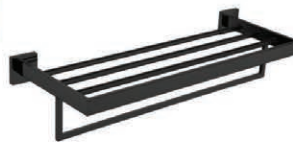


# INTEGRATED SUPPLIER OF BUILDING MATERIALS

## Kinlong Door Control Accessories



## Kinlong Bathroom Accessories



## Door Control & Bathroom



**KIN LONG**  
*For Better Living*

**Expert in Design and Manufacturing**

www.kinlong.com Stock Code:002791 Email: mail@kinlong.com

**Jansen Announces New Subsidiary, Jansen America Inc.**

Swiss company Jansen AG, a provider of steel profile systems, expanded its presence in the North American market via a new subsidiary, Jansen America Inc.

Based in New York City, Jansen America is ready to directly service the North American market. Jansen plans a growth strategy in 2024, including a localized product portfolio, certifications and additional partnerships.

**The Glass Guru Opens Pennsylvania Location**

The Glass Guru announced the launch of its newest franchise location: The Glass Guru of Levittown. Yogesh Patel will launch the new store location at 3580 Progress Drive, Unit A-1, in Bensalem, Pennsylvania. Serving Levittown and the surrounding communities, the new location aims to expand The Glass Guru’s reach and appeal to a new community.

**PEOPLE**



Schendt

**Halio** appointed *Doug Schendt* as the company’s new CEO. Schendt replaces Bruce Sohn, who retires after serving as CEO since 2020. Schendt, who previously led Halio’s Asia operations, is excited to head the company globally and lead it into its next phase of growth. Sohn says this is an exciting time for the company and he believes Halio is in great hands as Schendt continues the mission to bring products to customers worldwide.



Henderson

**PGT Innovations** appointed *Craig Henderson* as senior vice president and chief financial officer. As CFO, Henderson will lead the company’s finance strategy,

budgeting and planning, accounting, financial reporting, and investor relations functions. Henderson has been serving as interim CFO since February 2023. Henderson has over 20 years of finance leadership experience in manufacturing and tech companies.

*Anders Dahlblom* resigned from his position as the CEO of **Glaston Corp.**, due to personal reasons, according to a company announcement. The board of directors has started the search for a new CEO, but in the meantime, Glaston’s board nominated Antti Kaunonen as interim CEO.



Wood

**Permasteelisa** named *Nigel Wood* as group commercial director. Wood is an accomplished commercial director, say officials, focusing on productivity, efficiency and delivery of outstanding results. He has led groups of companies, business units and major projects across construction, infrastructure and specialist engineering businesses, including J Murphy & Sons and Laing O’Rourke.



Jewell



Longman

**Apogee Enterprises** appointed *Brent C. Jewell* as president of Apogee’s architectural glass segment. Jewell will succeed *Nick C. Longman*, who was concurrently named president of Apogee’s architectural framing systems segment. Jewell has served as president of Apogee’s architectural framing systems segment since August 2019. Longman joined Apogee as president of the architectural glass segment in 2021. ■

[bvbproducts.com](http://bvbproducts.com)

# Architectural muntins.

- ✓ Extensive profile catalog
- ✓ Ideal for contemporary facades or historic renovations
- ✓ Enhance aluminum storefront & curtainwall systems

*Now seeking independent sales reps!*

**BAM** | **BVB** Architectural Products





# LEADERS IN FABRICATION AUTOMATION



## CUT, FAB, WELD, CLEAN

Joseph offers solutions for all facets of window production - high speed, multi-track sawing, custom fabrication centers, welders, cleaners, automatic pass through welding/cleaning systems, & Industry 4.0 data collection systems



- SALES@JOSEPHMACHINE.COM  
- 717.432.3442





There's Always Another Level



**SOLARBAN<sup>®</sup>R100**  
Solar Control Low-E Glass



**SOLARBAN<sup>®</sup>R100 Starphire<sup>®</sup>**  
Solar Control Low-E Glass



**SOLARBAN<sup>®</sup>70 Optiblu<sup>®</sup>**  
Solar Control Low-E Glass



**SOLARBAN<sup>®</sup>60 Optiblu<sup>®</sup>**  
Solar Control Low-E Glass



**SOLARBAN<sup>®</sup>R67 Azuria<sup>®</sup>**  
Solar Control Low-E Glass



**SOLARBAN<sup>®</sup>70 Optigray<sup>®</sup>**  
Solar Control Low-E Glass



Give your building a performance and aesthetic advantage. The *Solarban*<sup>®</sup> family of solar control, low-e coatings delivers myriad choices for solar control and aesthetics. There's a *Solarban*<sup>®</sup> glass for every project. Learn more at [vitroglazings.com/solarban](http://vitroglazings.com/solarban)







DECORATIVE GLASS

INSULATING GLASS

LAMINATED GLASS

SHOWER DOOR SYSTEMS

ARCHITECTURAL ALUMINUM





**GLASSFAB**  
TEMPERING SERVICES, INC.

“Raise Your Glass With Excellence”

INDUSTRY PARTNERS





allows the organizations to protect their work, sell copies of the standards and license access.

The quality of these standards is rarely subject to dispute, and it's common for governmental bodies and agencies to incorporate standards and their methods into codes and performance requirements for projects with government oversight. This has created problems for the organizations that issue these standards.

Courts and legislatures typically hold that no one can own the law but have been slower in defining who can control the publication of that law. Efforts to provide free public access to standards incorporated into laws have resulted in lawsuits and contests from those claiming ownership or a right to reproduce the materials and charge for them.

Many courts have found that when a legislature enacts a law, they speak on behalf of that state's people. With people as the authors, laws are matters of public domain that cannot be copyrighted. This holds true even where a third-party industry standard, such as a code or safety compliance requirement, has been adopted into law.

#### **Project-specific impacts**

In response, some standards organizations have provided separate means of access or developed materials specifically for incorporation, which may

## **LEGAL**

# THIRD-PARTY STANDARDS MITIGATION

TECHNICAL QUESTIONS OF STANDARDS COPYRIGHT CAN HAVE PROJECT-SPECIFIC IMPACTS FOR DESIGNERS, ARCHITECTS AND TRADES

BY MATT JOHNSON



**C**an building codes be privately owned? Questions surrounding ownership of building codes and standards have been a source of ongoing legal debate for many years. A seemingly straightforward question of “who can own the law” is complicated when privately produced, industry consensus standards are incorporated into legislative or government agency actions.

#### **Standards creation**

Organizations like ASTM International, ASHRAE and the National Fire Protection Association spend countless hours engaging volunteers and industry participants to create standards, which the organization then copyrights. This

Editor's Note: The views expressed in contributed columns to Glass Magazine belong to the author and do not reflect the position of the National Glass Association or its technical committees.






# YOU ASKED. WE ANSWERED.

Best-In-Class Protection for a Dangerous Job



Available with  
mesh back for  
enhanced airflow

**AeroDex® Technology** | Lighter, more comfortable  
PPE that stands up to your needs!

-  Cut A9 Garments up to 30% Lighter
-  Gloves that Last 6X Longer
-  Unmatched Service & Savings



**LEARN MORE** [magidglove.com](https://magidglove.com)

**MAGID**

Safety at work®

give the essential points of a standard but can lack certain background or the expanse of data or considerations available in the full, copyrightable version. Technical questions of standards copyright can have project-specific impacts for designers, architects and trades. Beyond avoiding the risks of unauthorized use of third-party standards, the hidden exposure rests in “meet code” clauses and undefined project specifications.

Nearly every project contract includes generic language and undefined terms to ensure compliance with applicable building codes and local standards. The lack of detail and defined scope in the crossover with copyrighted standards and legislative codes can present a downstream risk. When details of applicable codes and specifications are not spelled out in a contract, builders and tradespeople must independently find and research these obligations. Where codes incorporate third-party

standards, controlling and owning those standards can impact the effort to determine what the code requires and, by extension, what the contract compels. This means trades must find the applicable code and ensure they are using the proper version of that code and its standards, which can also entail an outlay of monies to purchase the relevant technical documents so that the entirety of the code is available.

**Managing contract risks**

Uncertainty and ambiguity in contracts are risk points where legal exposure lives. Managing the risk of incorporated third-party standards, applicable codes and vague contracts can be daunting; however, a practical mitigation strategy can start with a few simple detail-focused acts.

Consider bid packages: whether a request for proposal or a quote, establishing the applicable codes, providing specifications on relevant

standards and listing specific incorporated third-party standards helps build in required costs, sets expectations early in the process, and provides greater certainty in the contract and negotiation of what those terms mean to the bottom line from monetary and risk management perspectives.

Beyond project needs is continuing education of industry standards and best practices. Access resources on material, performance and investigative standards issued by third-party industry organizations that can help ensure current practices are targeted toward the best methods. Then, when those standards are incorporated into governmental requirements, there will be fewer surprises, regardless of who owns the code. ■

Matt Johnson is a member of The Gary Law Group, a Portland-based firm specializing in legal and risk issues facing manufacturers of glazing products.

# 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





## EXIT DEVICES

Concealed Vertical Rod, Mortise, Surface Vertical Rod



## DOOR CLOSERS

Overhead, Concealed, Floor, Surface



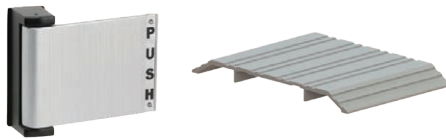
## LOCKSETS

Mortise, Cylindrical, Multipoint



## ELECTRIFIED HARDWARE

Electric Strikes, Power Supplies, Operators, Magnetic Locks



## TRIM & ACCESSORIES

Continuous Hinges, Thresholds, Pivots, Door Pulls

# WE LOVE COMMERCIAL DOOR HARDWARE.

At Orchard Lock, we're more than just enthusiasts; we're obsessed with hardware. We are proud to bring you the very best in the industry, featuring renowned brands that stand for excellence and innovation. Our commitment to you goes beyond the products; it's about ensuring you get the best industry pricing possible.

**GIVE US AN OPPORTUNITY TO QUOTE YOUR NEXT JOB.**

Send your take-offs to: [estimating@orchardlock.com](mailto:estimating@orchardlock.com)



[www.orchardlock.com](http://www.orchardlock.com) | 800.233.2146

Orchard Lock has direct access to all of the premier brands including:





Close-up of glass breakage detection system in action. Photo courtesy of k-Space Associates Inc.

## FIVE GLASS MEASUREMENT CHALLENGES

WHY INNOVATION AT SCALE REQUIRES METROLOGY TOOLS  
BY DAVE WINARSKI

**A** thorough and detailed inspection of architectural glass and the condition of glazing are vital in maintaining the safety and visual appeal of both commercial and residential structures.

Glass will pass through multiple levels of quality inspection during the manufacturing process, and the glass industry has unique requirements for edge inspection, broken glass detection, glass thickness calculation, as well as film thickness, spectral reflectance, absorption and color ( $L^*a^*b^*$ ) measurement, to name a few.

As the science and application of measurement, metrology is a results-driven approach that ensures glass products consistently meet both quality and throughput requirements. So, how does glass metrology work?

### Common problems, custom measurements

Metrology for glass and thin film combines state-of-the-art light sources, lasers, optics and detectors coupled with advanced software algorithms and machine learning to measure and analyze a variety of signals and features. Together, these deliver actionable insight into product performance and glass aesthetics.

Here are some common measurement challenges facing the glass industry, and how metrology is used to remediate each concern.

**Edge inspection.** Glass breakage can lead to potential hazards in the work environment and significant downtime due to equipment damage and maintenance. Real-time analysis of glass breakage and defects lets manufacturers quickly scrap defective product and

identify upstream manufacturing issues immediately. For edge inspection, in particular, the metrology tool is configured to detect small chips, cracks or other debris and abnormalities along the edge, as well as measure sub-millimeter changes in panel thickness, width and radial profiles. All while communicating results to the factory floor to deliver improved yield and performance.

**Color calibration.** For commercial glass manufacturing, accurate color measurement is crucial. Achieving this—with every single panel—typically entails custom solutions through spectral and imaging analysis.

**Film and coating thickness.** Thin films and coatings are improving everyday products by tuning optical, electrical and structural properties of glass and semiconductor surfaces and interfaces. Determining correct film thickness typically requires a non-contact, non-destructive, thin-film characterization sensor—one that relies on spectral analysis of light reflectance or transmittance. This effort is achieved via a custom optical metrology system that acquires spectral data and determines thickness in real time, all without interfering with the production line.

Likewise, spectral techniques are used to identify and quantify other film and coating characteristics. For example, an absolute spectral reflectance metrology tool is used to characterize various films.

### Measure it, manage it

As famed Austrian American management consultant Peter Drucker said, “If you can’t measure it, you can’t manage it.” And if you can’t manage it, you may never reach your manufacturing goals. Lean manufacturing at scale—and with a healthy margin—requires glass metrology.

Still, it’s important to note that metrology does not stand alone. Metrology tools must be designed so they integrate into the existing manufacturing environment, both its physical layout and digital infrastructure. ■

Dave Winarski is the Technical Sales Engineer at k-Space Associates Inc.



# Old-World Craftsmanship...



## for Today's Modern Glass



The F. Barkow Inc. commitment to quality and workmanship began in 1879 and continues today. Handcrafted welding is done by skilled craftsmen to build the highest-quality glass racks on the market today. Each fully-welded glass rack is custom-made in your choice of aluminum, stainless steel or high-tensile steel.

Barkow glass racks come equipped with Barkleats™, Barpads® and Baseplate Pads for added protection while transporting your fragile cargo. Our product line of glass racks ranges from cargo vans and pickup trucks all the way up to semi-trucks and trailers. Trust F. Barkow Inc. for quality, innovation and service.

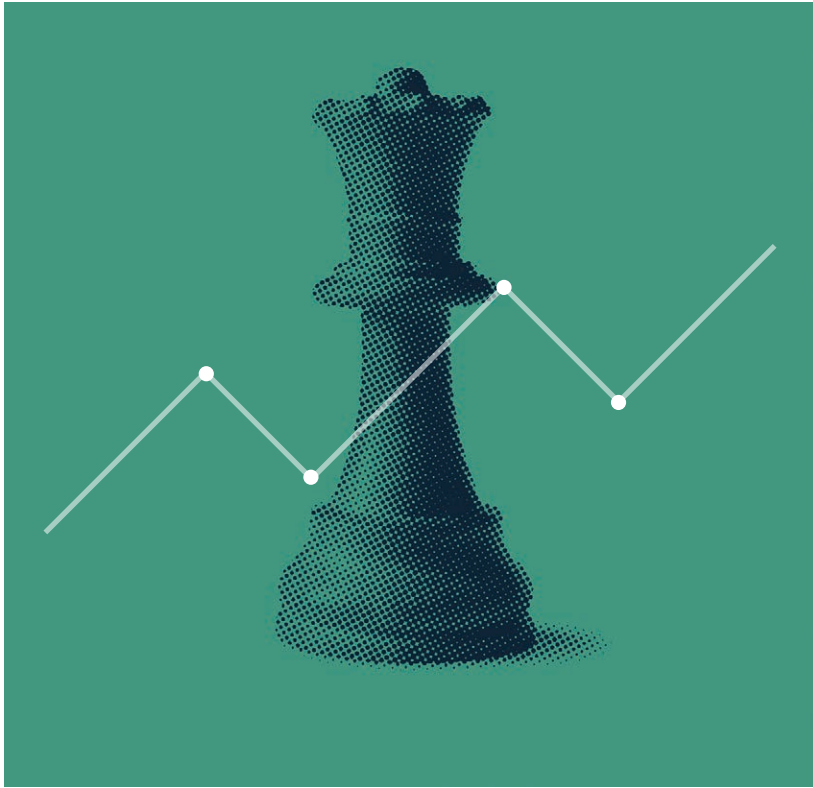
- Fully-Welded
- Aluminum, Stainless Steel or High-Tensile Steel
- 24" Splash Panel Protection
- Stake-Loc® Self-Locking Stakes

**Glass Handled With Care**  
FOR MORE THAN A CENTURY

**(800) 558-5580**



**WWW.BARKOW.COM**



### Managing financial uncertainty

I usually manage complex and uncertain circumstances by simplifying them. My preferred approach is to consider the extremes, which provide a good framework of potential outcomes.

With one extreme, the economy could perform better than expected. The problems are not as bad as forecasted, and we could have a normal year.

The other extreme is more concerning. In this scenario, the forecasts with the worst outcomes prove correct: a prolonged recession, real estate problems and other issues. This environment could put many companies out of business.

### The best strategy

I don't know how the economy will perform, and I suspect that most economic forecasters don't know either. For me, this uncertainty rules out trying to forecast the near-term future; the best strategy is to prepare.

The safest approach is to develop a strategy that offers protection against the worst-case scenario. Your plan should be flexible enough so you are well-positioned to capitalize on opportunities if things turn out better than expected.

I also suggest developing a robust "information filter" and focusing only on forecasts that could alter your opinion or strategy. Everything else is noise that only adds to the uncertainty.

#### 01. Build cash reserves

A sizeable cash reserve is essential for the survival and success of every company. Reserves enable you to handle problems quickly so they don't develop into expensive emergencies. Opinions differ on the proper size of a company's cash reserve, but the amount depends on your company's particulars and risk tolerance. While I prefer larger reserves that offer a better margin of safety, a three- to six-month reserve works well for most companies. A reserve that is smaller than one month is too risky.

#### 02. Evaluate customer credits

When cash is tight, most companies delay paying their vendors, which

## FINANCE

# FLEXIBLE STRATEGIES FOR A SHIFTING ECONOMY

YOU CAN'T PREDICT, BUT YOU CAN PREPARE FOR A 2024 ENVIRONMENT FULL OF UNCERTAINTY AND POTENTIALLY EXTREME OUTCOMES

BY MARCO TERRY



**Y**ou can't predict, but you can prepare.

The past year was turbulent and full of unsettling financial news. We had bank failures, increasing interest rates, growing inflation, geopolitical conflicts and a troubled real estate market—all clear indicators that serious trouble is on the horizon, if not already here.

Experts discussed their economic forecasts in interviews, which didn't help our understanding of the situation as most of them contradicted one another in their changing interpretations of risk probabilities. Rates and inflation were predicted to go up, sideways or possibly down, and depending on who you believe, the economy was headed for either a hard or soft landing.

These circumstances are challenging for construction company managers. With numerous potential outcomes and changing forecasts, how do you prepare your companies for 2024 in an environment full of uncertainty and potentially extreme outcomes?



# School Spirit

Photo: alanblakely.com

## Colorful metal façade generates school pride

**PAC-CLAD Flush panels in shades of gray** form a lively abstract of the Millennium High School mascot's tiger stripes, topped by the school's signature purple to emphasize the building's interior volume.

Explore the possibilities!



View the case study and video



[PAC-CLAD.COM](http://PAC-CLAD.COM) | 800 PAC CLAD

## Install Fire-Rated Glazing with Confidence.

Aluflam delivers specialized solutions in custom fire-rated glazing with true extruded aluminum fire-rated vision doors, windows and glazed wall systems, fire-rated for up to 120 minutes. Pre-assembled systems match up to non-fire-rated products and are ready to install for on-time, on-budget completion.

**aluflam**  
Fire-Rated Aluminum Window And Door Systems

Aluflam North America  
562-926-9520  
aluflam-usa.com



## INSIGHTS | YOUR PROFITS

creates problems for vendors expecting those payments to cover business expenses. Increase your chances of getting paid on time by running credit reports on your commercial clients to help reduce invoice delinquencies and improve cash flow. Always run credit reports before offering net-30 terms to clients. A company's credit quality can change quickly, so examine long-term clients' credit reports quarterly, not just at the start of a contract.

### 03. Clean up expenses

Unnecessary expenses, like unneeded, ongoing maintenance contracts, seldom-used services, subscriptions, etc., often accumulate over time. Each of these costs tends to be small and go unnoticed, but collectively, and over time, they can add up to a substantial amount. Examine your company's expenses and determine if any can be cut or modified.

### 04. Examine capital expenditures

Consider delaying any large capital expenditures until the economic outlook stabilizes. The last thing you want is to buy additional equipment (at expensive rates) that will be underutilized.

### 05. Anticipate financing

Lenders are tightening their credit standards and strictly enforcing covenants, making getting—and keeping—a loan more challenging. If you anticipate needing financing in 2024, and I suspect it will be harder to get mid-year, consider accelerating the application timeframe and preparing your accounting before applying for financing to increase your chance of success.

These conservative strategies focus on protecting against a bad outcome and can be changed if conditions improve. ■

Marco Terry is managing director of Commercial Capital LLC, a factoring company and provider of invoice financing to companies in the glass industry.

Photo: ©Woodruff Brown Architectural Photography





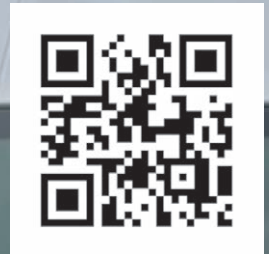
# The pole Locking System



**Have you ever thought  
about locking your  
products on a van glass  
rack?**



**We did it, one more  
innovation created by  
Bromer inc.**



Watch it on  
**You Tube**

**Prevents pole theft  
Prevents material theft  
Can be added to your existing rack  
Part of our glass rack options**

**Bromer Inc.  
1865 Jean Monnet  
Terrebonne Quebec  
J6X 4L7 Canada  
WWW.BROMERINC.COM  
INFO@BROMERINC.COM**

A photograph of a modern hospital room. The room features a glass partition wall and a door, both with white frames. The glass is reflective, showing the interior of the room and the hallway. The room contains medical equipment, including a patient bed, a monitor, and a IV stand. The walls are decorated with blue and white panels. The floor is light-colored. The text "Reimagine switchable glass." is overlaid on the image in a white, sans-serif font.

Reimagine switchable glass.



A photograph of a modern hospital corridor. The walls are primarily glass, revealing several patient rooms. Each room contains a hospital bed, medical equipment, and a desk. The rooms are numbered in blue on the glass: '03' is visible in the middle room, and '02' is visible in the room to the right. The corridor has a light-colored floor and a white ceiling with recessed circular lights. In the foreground, a thick, light-colored wooden bench is partially visible. The overall atmosphere is clean, bright, and professional.

Transform any space.

Congrats team!  
Our hospital  
has just been  
certified as  
a Level One  
Trauma Center!

1. CliC for instant whiteboards. 2. CliC





This  
changes  
everything.

Get ready to rewrite the rules for style, versatility and function of interior spaces.

CLiC™ switchable glass instantly transforms from privacy to crystal-clear views, on demand. Available in configurations for both exterior and interior applications, this is the breakthrough we've all been waiting for.

Visit [cardinalcorp.com](http://cardinalcorp.com) to learn more.

for privacy. 3. CLiC for transparency.

**CLiC**™  
On-Demand Privacy Glass

**CARDINAL**   
Glass Industries

Endless possibilities for architects and interior designers



North American  
float glass  
manufacturers  
explore  
partnerships  
with solar panel  
producers, and  
stay ahead of the  
curve with low-  
carbon products

THE  
WORLD  
OF

G L A



**Pictured:** The Parkland Moody Outpatient Center, a LEED Gold-certified health care facility in Dallas Texas, features natural daylighting thanks to Vitro Architectural Glass's Solarban 90 Acuity glass. HK Architects specified the product for its transparency, color neutrality, solar control and visual light transmittance. Partners included fabricator Hartung, and glazier IWR North America. Photo by Tom Harris.

What a difference a year can make. That was true of the North American, and indeed global, float glass industry in 2023. As inflation continues to depress commercial and residential building, a new segment of the float glass industry is emerging: glass for solar panel production. In this uncertain environment, North American producers are having to set their sights both short-term and long-term; meeting customer demands for increasingly stringent energy performance while improving and updating manufacturing processes for sustained pushes toward industry decarbonization.

# SS



For information on float plant locations worldwide, download the updated World of Glass float plant database at [glass.org/store](https://glass.org/store).

Parkland





## SOLAR PANEL PRODUCTION MAY TRANSFORM SUPPLY IN NORTH AMERICA

While the float glass supply in 2022 was tight, that changed in 2023 due to economic slowdown, says Stephen Weidner, president and head of architectural glass North America and solar products, NSG Group. Unprecedented inflation and interest rates have depressed both the commercial and residential markets in North America, and the “domino effect” of the pandemic continues to affect commercial building, including office and retail construction and even institutional builds, he says.

While the dip in demand might have led to overcapacity, says Weidner, the expansion of glass supply to solar panel, or photovoltaic, production has balanced

this out. “This growth in the solar [panel market] has absorbed a lot of this under-utilized capacity that we would have historically seen in the market from all these negative impacts,” he says.

### Glass for solar panel production grows to 5% of the market

Weidner says glass for solar panels is now a significant sector of the raw glass market, joining the commercial/architectural, residential and automotive segments. To demonstrate the sector’s rapid growth, demand for glass from the solar panel market has risen from 0% five years ago to 5% of the market in 2023,





Architect Gensler specified Solarban 60 Starphire glass for the newly upgraded midtown Manhattan office building, 135 West 50th Street in New York. Designers chose the glass for its balance of clarity and energy efficiency. Photo by Robert Deitchler, courtesy of Gensler.

says Weidner. About three North American float lines are now fully dedicated to the segment, he says, and that's just the beginning. "If you look at next year, it's going to be four lines, and the year after that will be five or six lines."

Both NSG Group and Vitro Architectural Glass supply First Solar, a solar panel manufacturer. NSG's Luckey, Ohio, plant supplies First Solar in the U.S., and the company announced in November 2023 that a float line at its Rossford, Ohio, plant will install online coating capacity and will start shipping transparent conductive oxide glass for solar panel manufacture in the first quarter of 2025. The company has also

increased glass supply to the sector globally; it converted a float line at its factory in Johor, Bahru, Malaysia, to produce TCO glass. "NSG is also considering expanding further capacity for solar energy glass in the U.S., to ensure it meets solar glass demand by First Solar," say officials in the announcement.

Vitro's partnership with the company accelerated in 2023; they announced their first contract in April and another in October of that year. Vitro is rebuilding its second line at its Meadville, Pennsylvania, plant to supply the contract; the float line had been idled due to low capacity and the prohibitive cost of rebuilding it at the start of the pandemic.

Following the company's second contract with First Solar, Vitro announced that it would idle line 1 at its Carlisle, Pennsylvania, plant in order to reconfigure it to produce glass for solar panels. Line 2 at Carlisle will continue to manufacture glass for commercial and residential applications. Overall, the company is investing about \$180 million to refurbish the Meadville and Carlisle plants to produce glass for First Solar, according to officials.

"The agreement further strengthens our supply chain, not only in the U.S. but also in North America," says Paul Bush, vice president, technical services, sustainability and government affairs, Vitro Architectural Glass. "Our Meadville plant already has the necessary raw materials, and its strategic location is well-suited to accommodate First Solar's production."

#### **Solar panel producers expand in the North American market**

First Solar itself is also expanding. In September 2023, the company broke ground on a new facility in Louisiana, with plans for further expansion in Alabama and Ohio. The Inflation Reduction Act has incentivized the production of PV panels, and several companies have announced new locations in the North American market, including Canada-based Heliene; Meyer Burger Technology AC, based in Switzerland; Italian energy company Enel; and Vikram Solar, an India-based solar module producer.

**TO  
DEMONSTRATE  
THE SECTOR'S  
RAPID GROWTH,  
DEMAND FOR  
GLASS FROM  
THE SOLAR  
PANEL MARKET  
HAS RISEN  
FROM 0% FIVE  
YEARS AGO  
TO 5% OF THE  
MARKET IN  
2023**



Float glass being processed at Guardian Glass's facility in Czestochowa, Poland. Photo courtesy of Guardian Glass.

Canadian Premium Sand, which in 2021 announced plans to build a new float plant, continues to develop manufacturing capacity for a patterned solar glass facility to be located in Selkirk, Manitoba, Canada, slated to be operational in 2025. An update on the project in August 2023 noted that the expansion of solar panel manufacturers in the North American market represented “an additional 29 [gigawatts] of potential incremental demand for patterned solar glass and brings [CPS’s] current estimate of market demand to over 100 GW by 2027.”

### Glass supply remains a headwind for future growth of solar panel production

Other than Canadian Premium Sand, the new market is unlikely to be supplied by new U.S. float plants soon, says Cardinal Corp.’s Bowie Neumayer, vice president of sales and marketing. “Economics make it very hard to build a float plant today. The cost is very hard to justify,” he says. Inflation has even further dampened float producers’ ability to build new lines, says NSG’s Weidner. “The inflation we’ve seen in the last couple years has impacted the cost of building a new line, and to repair existing ones. That’s impacting the industry in general, and not just in North America,” he says.

Assuming no new significant capacity in North America, the increased supply

of raw glass for solar panel production may pinch supply for other sectors, says Weidner. While he hopes for the rebound of the commercial and residential markets, once they do return, it will likely mean a very tight glass market. “I do see that the demand will outstrip North American supply at some point,” he says, possibly a year to three years in the future, a development that may result in increased overseas imports.

## GLOBAL CHALLENGES MAY IMPERIL INDUSTRY GROWTH AROUND THE WORLD

This last year continued to see major global challenges. As of this writing, a new conflict in the Middle East has compounded global tensions already running high due to the war in Ukraine. In June 2023, NSG Group disposed of its joint venture in Russia, and Guardian Glass sold its two Russian float facilities the previous summer.

Ongoing conflicts have the potential to disrupt the glass supply for North America. Although about 97% of North America’s leading fabricators source glass from North America, according to Glass Magazine’s 2023 Top Glass Fabricators report, 29% also source glass from Europe and 24% from Asia.

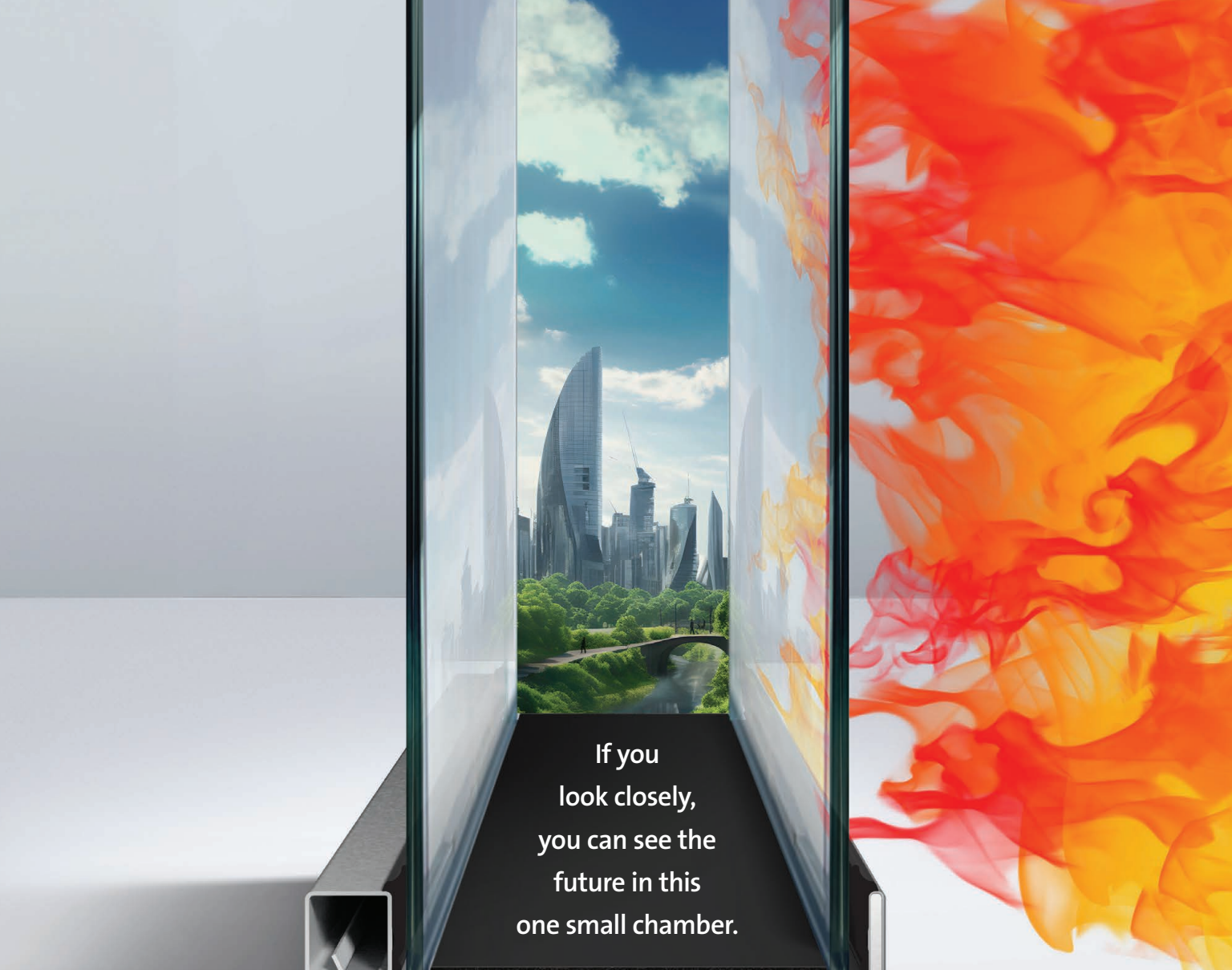
Wassim Khalil, commercial manager, Sphinx Glass, one of three float producers based in Egypt, says the regional float glass market is robust. “The glass market is growing, and it will definitely grow more because of the growing population in Egypt, Africa and the Middle East. There’s a demand for glass there.”

That growth will depend on regional stability, he says. “When I say stability, I mean economic stability and political stability in our region, so we can invest more in the coming five years to meet the demands of the market,” he says. “If there is no stability, I doubt that any one of us will put more money into that sector in the industry.”

Representatives at Xinyi, a major float producer headquartered in Asia, say the Asian market is also seeing “robust growth.” “Around 80% of the world’s production capacity is concentrated in Asia, underscoring the region’s significant market influence,” says Harold Wang, head of the international sales division, Xinyi Float Glass.

The company is currently opening a new float plant in Indonesia, scheduled to be operational within the next year, says Wang, and is looking to expand further. “In an effort for global business expansion, Xinyi remains open to partnerships with reputable local partners.”





If you  
look closely,  
you can see the  
future in this  
one small chamber.

## INTRODUCING CONTRAFLAM<sup>®</sup> ONE

ONE CHAMBER. ALL RATINGS.

***vetrotech***  
SAINT-GOBAIN



The first fire-resistive glass with a single-chamber foaming interlayer for all performance classifications, CONTRAFLAM One delivers:

- » **Clearest** panes with highest visible light transmission
- » **Lightest weight** for easier handling and faster installation
- » **Lowest embodied carbon** for greater sustainability

## FLOAT PRODUCERS CONTINUE TO LOWER EMBODIED CARBON THROUGH SUSTAINABLE MANUFACTURING

In 2023, NSG Group became the latest float glass producer to offer a low-carbon, flat glass product, Pilkington Mirai. Mirai represents a 50% reduction in embodied carbon compared to standard float glass, according to the company, which was accomplished using biofuel. The range joins low-carbon offerings, including Planibel Clearlite by AGC and Oraé by Saint-Gobain.

Using alternative fuels to power float glass production requires significant technical consideration and is a complex process, says NSG's Weidner. "The availability of some of these other sustainable fuel sources is rather limited because the market hasn't created need from a demand perspective," he says. Beyond availability and cost, the company also has to consider the impact of different fuels on production equipment, he says.

### Guardian explores furnace alternatives towards sustainability

Guardian Glass is exploring power alternatives like electric melting, or "boosting," through a partnership with Glass Futures, a global non-profit research and technology organization that aids companies in decarbonization by encouraging knowledge-sharing across the supply chain. The partners have created a pilot float line with a furnace capable of using electric melting to provide up to 60% of the energy required to melt glass, says Rick Zoulek, executive vice president, Americas, Guardian Glass.

"The challenge is for us to transfer these projects from the concept stage

to full production without disrupting our operations," says Zoulek. "The Glass Futures pilot line will provide an opportunity to try out some of our concepts on a furnace so we can de-risk the implementation of new technologies onto our float furnaces."

Guardian also recently completed a successful cold tank repair of its furnace at its Bascharage, Luxembourg, facility. The furnace is now the most energy-efficient the company has, Zoulek says, consuming 25% less natural gas when compared to traditional furnace methods.

### Floaters communicate material transparency through EPDs

Embodied carbon and global warming potential continue to be of interest to architects. Environmental Product Declarations, or EPDs, remain one of the main ways companies can express material transparency and global warming potential to the design community. "EPDs are technically voluntary, but they're really a necessity," says Alan Kinder, director,

commercial segment, Guardian Glass. "You can't walk into an architect's office without it."

Guardian plans to release an updated North American flat glass EPD in early 2024, with a cradle-to-gate embodied carbon value that will meet the top 20% limit in the General Service Administration's Low Embodied Carbon Material Standard.

Vitro released updated EPDs for flat and fabricated glass in June 2023. The updated glasses now contain 6% lower embodied carbon than the National Glass Association's industry-standard figure. Vitro officials say more efficient use of batch material, furnace efficiency and oxy-fuel technology all aided in the carbon emission reduction. Oxy-fuel can reduce energy consumption in glass melting furnaces by as much as 20% and cut greenhouse gas emissions in half, say officials. The company also offers sustainability resources on its website, including a Cradle to Cradle Certified Material Health Certificate, a LEED Recycled Content Letter, Material Safety Data Sheets and a Living Building Challenge Red List of Materials. ■



NSG/Pilkington's new low-carbon glass, Mirai, represents a 50% reduction in embodied carbon compared to standard float glass, according to the company. Photo courtesy of NSG Group.





In the realm of glass manufacturing, Xinyi Glass (XYG) is among the world's leading manufacturers in the industry, renowned for setting high standards in the industry. We take pride in our unwavering commitment to high quality product and exceptional customer service, consistently exceeding expectations in delivering product solutions for award-winning projects worldwide.

At XYG, we leverage cutting-edge coating and fabrication equipment, bolstered by our extensive experience in managing an international supply chain. These strengths have propelled us to the forefront of the architectural glass industry. With our dedication to value creation and customer satisfaction, you can trust XYG to provide high-quality products and services that consistently surpass your expectations.

XYG stands as the world's largest float glass manufacturer, manufacturing with an impressive daily melting capacity exceeding 29,000 tons, accounted for over 10% of the global float glass market supply.

FLOAT GLASS DIVISION

**XINYI GLASS & MIRROR NORTH AMERICA**

[WWW.XINYI GLASS.COM/EN](http://WWW.XINYI GLASS.COM/EN)

[SALES@XYGLASS.COM](mailto:SALES@XYGLASS.COM) • 416.529.3738

ARCHITECTURAL GLASS DIVISION

**XYG NORTH AMERICA**

[WWW.XYGNA.COM](http://WWW.XYGNA.COM)

[INFO@XYGNA.COM](mailto:INFO@XYGNA.COM) • 905.947.8801



Let your shower glass shine!



Pilkington **OptiShower™**

Clear Glass

Aging tests at high temperature and humidity demonstrate that Pilkington **OptiShower™** limits the corrosive process and limescale deposits compared to untreated glass.





For high humidity applications

## Pilkington **OptiShower™**

Pilkington **OptiShower™** is an excellent solution for high humidity applications. Our online pyrolytic coating mitigates water stains by preventing sodium leaching and is durable enough to withstand tough environments. Maintain cleaner glass with minimal upkeep by using Pilkington **OptiShower™**.

**1.800.221.0444**

**buildingproducts.pna@nsg.com**

**www.pilkington.com/na**



Scan for more on  
high humidity  
glass solutions



**INSTITUTIONAL  
CONSTRUCTION  
STARTS TO EDGE  
UP 3% IN 2024**

**ECONOMIC UNCERTAINTY HUNG  
OVER 2023 AND IS CARRYING  
OVER TO 2024, BUT MANY  
INDUSTRY EXPERTS REMAIN  
CAUTIOUSLY OPTIMISTIC ABOUT  
THE YEAR AHEAD, PREDICTING  
A STRONGER AND MORE  
CONSISTENT CONSTRUCTION  
MARKET.**

**COMMERCIAL  
CONSTRUCTION  
TO EDGE DOWN  
2% IN 2024**

**THE 2024  
FORECAST:  
TOP  
TAKEAWAYS**

**BY TARA LUKASIK**



**RETAIL CONSTRUCTION  
STARTS TO INCREASE  
9% IN 2024**

**LABOR SHORTAGE  
TO PERSIST IN LONG  
TERM**

**CLINICS, HOSPITAL  
CONSTRUCTION TO  
FUEL 2024 WITH AN  
INCREASE OF 5.6%**

**Editor's Note:** The following is based on forecast presentations from the 2024 Annual Outlook Forecast Conference from Dodge Construction Network, the Construction Economy Outlook semiannual webcast by ConstructConnect, and Connor Lokar's annual economic forecast keynote presentation from GlassBuild America 2023.

---

## **Economy on edge, economists split on recession predictions**

In looking at the macroeconomic pressures facing the U.S. economy, including stubborn inflation, high interest rates, tight lending standards, labor shortage, rising energy prices and geopolitical turmoil, it's impressive that the economy has remained recession-free. Resilient consumers, a healthy labor market, and public funding for manufacturing and infrastructure helped, but the challenges of 2023 will shift over into 2024, according to Richard Branch, chief economist for Dodge Construction Network.

"We're anticipating that 2024 will bring about more consistent growth as well as more opportunity in the construction sector," says Branch, "but the economy will remain challenged at least over the next three to six months. Still, we're remaining confident that the U.S. economy will remain recession-free."

However, Branch adds that this is dependent on the assumption that the Federal Reserve is done raising interest rates. Dodge forecasts that the Fed will start cutting rates around the midpoint of 2024. "The takeaway here is we know the construction sector is an extremely interest-rate-sensitive portion of the economy, particularly in sectors like the residential market," says Branch. "We think that by the end of the year, the U.S. economy is going to be on much more stable footing, which should create more opportunity in the construction market."

Other economists are not as optimistic. During a presentation at 2023 GlassBuild America, Connor Lokar, senior forecaster,

ITR Economics, projected that the overall U.S. economy will most likely enter recession in the coming months, with nonresidential construction beginning to feel the effects in late 2024. Lokar anticipates the recession will be mild but will demand that companies plan for a downturn to ensure they are protected, and may even offer time for them to explore new opportunities during the slower business cycle. “This is not going to be as bad as 2008 or 2009. The businesses that will get into trouble are those that don’t plan for it,” he says.

#### Extras

- Dodge estimates that U.S. gross domestic product growth will slow in 2024.
- The Congressional Budget Office forecasts GDP to speed up, averaging 2.4 percent a year from 2024 to 2027, in response to projected declines in interest rates.

### Inflation is still volatile but slowly stabilizing

In terms of major economic indicators, inflation has remained at the top of the list over the past year. “We’ve seen significant progress over the last year,” says Kermit Baker, chief economist, American Institute of Architects. “A year ago, [the numbers] were a little over 8%. A few months ago, we saw them hit a low of 3%; they’ve come down dramatically. Generally, we’re moving in the right direction, even though we’re not done with the inflation issue yet.”

Alex Carrick, chief economist, ConstructConnect, shares the sentiment on falling rates. “As interest rates stabilize and then begin to decline after Q1 or Q2 of next year, the homebuilding sector will revive.”

“What we’re seeing from an interest rate perspective, it’s hard for developers to make the returns, and they’re going to seek returns elsewhere,” says Jay Bowman, principal, FMI Corp., referencing private construction.

#### Extras

- The Federal Reserve’s latest macroeconomic projections indicate a gradual reduction in inflation rates, averaging 2.5% in 2024, decreasing to 2.2% in 2025 and aligning with the Fed’s 2% target by 2026.
- Credit should start easing during the back half of 2024, but the banking sector will continue to be skittish, says Branch.
- Construction expenditures are forecast to increase 3.7% yearly in nominal terms through 2024, according to the Construction: United States report by Freedonia Group.

### Material price inflation about to turn

Talk in the construction industry has been dominated by the issue of bid and material prices, and Dodge’s Branch says that the industry will continue to

**OVERALL CONSTRUCTION STARTS ARE EXPECTED TO RISE 7% IN 2024, FOLLOWING A 1% INCREASE IN 2023, ACCORDING TO THE DODGE FORECAST. THE 2023 INCREASE WILL BRING TOTAL STARTS TO AN ESTIMATED \$1.124 TRILLION, WITH \$1.206 TRILLION FORECAST FOR 2024.**

#### Total construction starts

2023

**\$1,124B**

2024

**\$1,206B**



**6:45 AM**

A brighter wake-up call.

99 West Paces Apartment Homes

## Create lasting moments.

Stunning architectural design creates glimmers of precious, unexpected joy. At YKK AP, we develop award-winning facade solutions that reduce carbon, improve thermal performance, and enhance comfort for everyone. Our commitment to saving energy and sustainability means unforgettable moments for generations to come.

We Build a Better Society Through Architectural Products.

**YKK**  
**ap**®

**“THE NUMBER OF PEOPLE HIRED HAS BEEN TAILING OFF. YOU MIGHT THINK THAT INDICATES A DECLINING DEMAND FOR WORKERS, BUT I THINK IT INDICATES HOW HARD IT IS TO FIND WORKERS TO FILL THOSE POSITIONS”**

Ken Simonson, Chief Economist, AGC



see good news. “[The composite index of building materials] is contracting after that steep run-up that we saw in the wake of the pandemic. And bid prices are starting to be essentially flat from where they were last year. We’re going to see continued relief in bid prices, contracting a little over the coming months through Q1 and maybe even early Q2 of 2024, but that contraction is also going to be brief, and we’ll start to see them re-accelerate. They’ll return to more normal growth, somewhere in the 3% to 5% year-over-year range.”

Supply chains also improved in 2023, with the Global Supply Chain Pressure Index hitting a historical low in October 2023 and almost all material divisions seeing stable or improving lead times, showing that supply disruptions are in the rear-view mirror, for now, according to real estate and investment management JLL Capital Markets. In 2024, slowing private-sector construction starts should keep supply chain pressure manageable, but the current pipeline and increase in publicly funded construction is anticipated to prevent price reductions.

### **Labor challenges continue**

Limited labor availability is expected to persist for the long term, according to the U.S. Bureau of Labor Statistics. Due to ongoing shortages and an increase in people leaving the industry, overall growth of the construction labor force will slow from its current, already inadequate, pace in 2024, severely limiting how many projects owners and developers can take on. While advancements in technologies can ease some of these pressure points caused by the labor market, it cannot fully replace the need for labor.

“The number of people hired has been tailing off. You might think that indicates a declining demand for workers, but I think it indicates how hard it is to find workers to fill those positions,” says Ken Simonson, chief economist, Associated General Contractors of America. “The unemployment rate in construction has come all the way down to the same level as the overall economy, to 4% or less, and that’s really exceptional.”

In North America, as the industry faces skilled labor shortages and falling

productivity, competency and efficiency will be increasingly valuable among the workforce. Retention and upskilling are critical for the next year and beyond.

“The big challenge for contractors is going to continue to be finding workers,” says Simonson. “And I think that will be with us for many years.”

Companies may wish to take advantage of broader incentives, like the Inflation Reduction Act tax credits available for companies who hire registered apprentices, which may build demand for apprenticeship programs, potentially expanding workforce training opportunities and benefitting employers.

### **Extras**

- The BLS projects that the labor force participation rate will continue to decline in 2024, although at a slower rate than that seen before the onset of the 2007–09 recession, falling 2.0 percentage points to 60.9% in 2024.
- Simonson forecasts that construction wages will rise 5% to 7% over the next year.



## DESIGN PARTNERS ADVOCATE FOR NACC CONTRACTORS

“As **architects**, we always want to **achieve** what we are **specifying** and accomplish the goal of having beautiful **buildings that work**. Making sure the **glass** and metal are **installed professionally** and at the **highest level of competence** is something we all greatly value.”

– Rowan O. Georges, AIA, Sr. Associate Principal  
Skidmore, Owings & Merrill (SOM) | New York, NY

**MITIGATE RISK.  
BUILD BETTER PROJECTS.  
STRENGTHEN THE INDUSTRY.**

**WWW.NACCPROGRAM.COM**

# NACC

North American Contractor Certification

The North American Contractor Certification Program recognizes architectural glass and metal contractors that consistently demonstrate quality and safety excellence.

The program offers an ANSI-accredited third-party endorsement of companies having completed a significant and time-intensive evaluation process establishing a baseline for competency, business practices, and adherence to industry-accepted guidelines.



# THE COMMERCIAL SECTOR IS EXPECTED TO FALL ANOTHER 2% TO APPROXIMATELY \$153 BILLION NEXT YEAR, ACCORDING TO DODGE OFFICIALS.

## Commercial Construction Starts



## Geopolitical conflicts and trade tensions loom

The Israel-Hamas conflict raises concerns about potential wider Middle East tensions, possibly impacting energy and other raw material prices. U.S. sanctions on Iran and possible retaliatory actions, including threats to the Strait of Hormuz, could further escalate these issues. And the ongoing tensions between the U.S. and China could also stoke inflation.

In February 2023, the Aluminum Extruders Council reported on the White House proclamation adjusting imports of aluminum into the U.S. and significantly increasing costs for aluminum smelted or cast in Russia. Tariff rates on most metals and metal products will double from 35% to 70%. U.S. imports of unwrought aluminum and alloys from Russia amounted to 191,809 tons, or roughly 4.4% of the more than 4.4-million-ton total last year, compared with 8.9% in 2018 and 14.6% in 2017.

Rising energy prices and geopolitical tensions are new risks added to the matrix that Dodge examines. Branch also cited rising tensions in Russia, Ukraine and the Middle East as possible obstacles

in the coming year. “Geopolitical risk remains intense,” he says, but Dodge forecasts that “tensions will start to ease in the coming three to six months.”

### Extras

- The U.S. initiated a 200% tariff on all Russian-made aluminum in February 2023, which applies to about \$2.8 billion worth of materials.
- Chinese materials used in the glass, glazing and metal industries are still subject to the 10% tariff that went into effect September 2018, despite a U.S. International Trade Commission report that found American importers have borne most of the costs.
- In June 2023, the Aluminum Extruders Council asked the Commerce Department to reform its tariff exclusion process for U.S. aluminum extrusion products.

## Commercial construction edges lower

The commercial sector, which includes stores, offices, warehouses and hotels

is expected to fall 6% to \$156 billion in 2023, then another 2% to approximately \$153 billion in 2024, Dodge predicts. “If you pull the warehouse sector out of that minus 2%, construction starts for commercial are actually positive,” says Branch.

Connor Lokar, senior forecaster, ITR Economics, who delivered the annual economic forecast keynote presentation at GlassBuild America concurs on nonresidential construction lags. “For companies on the non-residential side, it has been great. ... And next year should be great, or at least good. But be careful of what comes next,” Lokar says. “You’ll be in recession by end of 2024.”

Market conditions may not be especially supportive right now. “What this says to me, is that projects are going into the queue, working their way through the planning cycle... moving slowly to start... to make sure that the market conditions in 2024 will be supportive,” says Branch. “It could be due to labor, costs or materials challenges, but if the signs indicate a good market, they want to be ready to move those projects forward. Once the economy is a little more stable, these projects will start moving through to groundbreaking.”



Share your project photos of Powr-Grip products in use @woodspowrgrip



# PROS EXPECT THE BEST



For nearly 60 years, Wood's Powr-Grip has put vacuum lifting power in your hands, providing you with a grip you can trust. The new 8" pad design is the best one yet. For information on Powr-Grip or our products, go to [wpg.com](http://wpg.com).



WATCH VIDEO NOW



"I've always used Wood's, never had a failure. This new design is great with the one-handed... [attach] Best one yet!"

**CHRIS NITSCHKE,**  
Glazier for 30+ years



"[I've] been using your suction cups for over 30 years and my father used them before that, too. Glaziers' best friend!"

**JIM CATAZANO,**  
Union Glazier



"I have never seen a professional glazier use anything other than a Wood's suction cup."

**RAMON ORTIZ,**  
Glazier for 20+ years

# “RURAL CONSTRUCTION FOR NONRESIDENTIAL HAS PICKED UP TO ABOUT \$10 BILLION IN ACTIVITY OVER THE LAST COUPLE OF YEARS.”

Richard Branch, Chief Economist, Dodge Construction Network

	Office Construction Starts	Retail Construction Starts	Hotel Construction Starts
2023	▼ <b>\$56B</b>	▲ <b>\$20B</b>	▲ <b>\$12B</b>
2024	<b>\$55B</b>	<b>\$21B</b>	<b>\$14B</b>

## Offices

Office construction under stress

Office starts are expected to decline slightly, at a rate of 2%, in 2024, following two years of growth at a rate of 30% in 2022, and an additional 5% in 2023. While demand for traditional office space still suffers in the wake of the pandemic, data centers are expected to have “aggressive growth” in 2023 and 2024, says Branch. “When we pull out data centers, the 2% drop in overall office construction drops further by 6%.”

“If you look at office occupancy, it’s been sitting around 50 percent,” says Branch. “Office vacancy rates [are] sitting around 18%, up 140 basis points from where they were a year ago. Core office construction never gets back to where it was in 2019. We continue to believe here that remote and hybrid is going to continue to be a driving force in the employer-employee relationship.”

## Retail

Retail construction starts edge up

“Retail is probably the strongest link between the residential sector and the nonresidential sector,” says Branch. “There’s a 12-month lag between the start of single family and the start of a retail development. But e-commerce kind of broke that. There’s still a lot of retail to residential development going on, relative to what we saw in the wake of the Great Recession.”

Dodge officials believe that the slow residential market is holding back retail starts, but that will change in 2024 with an increase of 9%, both from renovations and additions to existing buildings of top retail chains and the growing trend of residential construction moving from urban areas into the suburbs and even further out into the rural areas of the country.

“Rural construction for nonresidential has actually picked up to about \$10 billion in activity over the last couple of years,” says Branch. “It’s an area where the building stock has not kept up with the current population growth, and we’re seeing a lot of retail activity. We think that continues in 2024 with another gain here in retail starts, but project mix is very important.”

## Hotels

Slowing economy hurts hotel starts

Hotel starts are down 5% in 2023 but will increase 16% in 2024. An extremely competitive sector, in the wake of the Great Recession, hotel starts accelerated, but interest rates and tightening lending standards choked off development in 2023.

“Hotel fundamentals are very solid,” says Branch, particularly in the high-end market. “I hate to call anything recession proof, but those luxury and upscale projects are moving ahead whether the economy is slowing or not.”

Branch thinks that hotel chains are betting on a big return in business travel, that business travel will continue to grow, but will stay well below pre-pandemic levels. “The lower-middle hotels where most business travelers stay and extended-stay class of hotels, I think those are more about value,” adds Branch. “I think that comes into play more in 2024.”



# DEPENDABLE

G l a s s  W o r k s

We cut, bevel, edge, insulate, laminate, temper...

We fabricate and customize for you!

Insulated Glass, Impact Resistant Glass,  
Counter tops, Table Tops, Shelving...

Custom glass and mirror projects  
for residential and commercial applications and more!



**SERVING THE GLASS INDUSTRY WORLDWIDE FOR OVER 57 YEARS**

All fabrication is performed IN-HOUSE at our 3 historic Covington, LA plant locations

Call or email us about our inventory of low iron, antique mirror and textured glass.

[ordering@dependableglass.com](mailto:ordering@dependableglass.com)

[www.DependableGlass.com](http://www.DependableGlass.com)

800.338.2414 • 985.892.0999

---

## Institutional building to ease in 2024

Institutional construction starts are projected to increase 3% in 2024, following the upward trend of 7% in 2023 and 23% in 2022. “There’s a lot more diversity here in project type, project size and geography too,” says Branch. “To me, this says a lot more about stability in the institutional market.”

### Education

#### K-12 starts larger, but more volatile than university

The largest institutional construction sector, K-12, colleges and universities, and educational laboratories, libraries and museums are a mixed story, according to Dodge. “Mostly state and local funding drives [them] and those budgets are in really solid shape,” says Branch. “On the bad side, demographics are shrinking on the school age population and mixed-college construction. Overall, demographics are weaker for colleges and universities than they are for K-12.”

“Looking at the total market,” adds Branch, “if I were to rank the three by growth opportunity, I would put the K-12 market at the top. I think the strongest growth market in education is the laboratory market, but it’s a smaller portion of the total overall. The college sector is much like the hotel sector; it’s extremely competitive on who has the best facilities.”

### Health care

#### Clinics, hospital construction to fuel 2024

Among the stronger sectors is health care, which FMI forecasts will end 2023 up 9.4%, with an additional increase of 5.6% in 2024. While hospital construction has been relatively flat, medical office buildings have had a “meteoric rise” in the past 10 years, says Bowman. Once just representing one-fifth of the amount

### Healthcare Construction Starts

2023

**\$37B**

2024

**\$39B**

spent on construction of hospitals, he adds: “I believe [by] 2027 that we will have more spending on medical office buildings than we will on hospitals.”

Dodge predicts that clinic and hospital construction will fuel 2024, increasing 5%, and ranking clinics as the strongest and above trend, with hospitals right at trend, and the nursing home sector bringing down the average. Urgent-care centers, located mostly in suburban strip malls, are part of the retail growth happening in the suburbs, and signal a positive sign for healthcare clinic construction.

“We are starting to see reinvestment in the health care and hospital market. Clinics are looking more stable, much like hospitals, and both have been relatively flat over the past few years in terms of construction activity,” says Branch. “The nursing home side has fallen significantly, with construction about half of what it was pre-pandemic.”

### Extras

- Dodge expects corporate campuses to pick up strength again in 2024.
- In 2022, square feet for K-12 was nearly five times the size of the post-secondary market.

“Commercial construction pretty much moves lock-step with the economy, and follows the single-family market,” says Branch. “The economy slows down construction, and commercial starts slow down with it.”

---

## High rates, lending standards hurting residential starts

Single-family construction organically leads the construction sector into decline or recovery, according to Branch. “Residential leads commercial buildings, like retail leads institutional buildings like hospitals and schools.”

The total dollar value of residential starts is expected to end 2023 down 13%, before rising 11% in 2024.

“The residential market split, with single family going one way towards a pseudo recovery, and multifamily going the other, peaking in December 2022, and falling since,” adds Branch.

ConstructionConnect’s Carrick believes that falling rates are the key to a thriving residential market. “As interest rates stabilize and then begin to decline after Q1 or Q2 of next year, the homebuilding sector will revive.” ConstructConnect’s forecast predicts a 4.4% increase in 2024 for total residential starts, with a more robust 15% increase expected the following year.

### Single family Starts tied to mortgage rate pressures

In the residential sector, Dodge predicts single-family construction will end 2023 down 12%, measured in units, before climbing 3% in 2024. Branch notes that while the bottom for single-family starts has passed, mortgage rates need to ease before the sector will see stronger growth.

“New home sales, tightly correlated to new home construction starts, are up 5% on a year-to-date basis,” says Branch. “With mortgage rates where they are, we’re not going to see a big run up in single-family construction anytime soon. People are still buying homes right now even with mortgage rates where they are.”

Branch believes that downward pressure on mortgage rates will come



# ONLINE glazier training

Glaziers and Glass Shops all over North America  
DEPEND on MyGlassClass.com for their training,  
recruitment, and retention.

**MYglassclass.com**  
An initiative of the **NGA**

**NOW MORE THAN EVER**

## *Having A Fully-Trained Workforce Is Crucial*

- ✓ OVER 100 COURSES AVAILABLE ON-DEMAND VIA COMPUTER, TABLET, OR SMARTPHONE
- ✓ COURSES AVAILABLE IN SPANISH, TOO!
- ✓ OSHA & UL COURSES
- ✓ LEARNING TRACKS FOR FABRICATORS, CSR'S AND MANAGEMENT
- ✓ CONVENIENT MANAGEMENT DASHBOARD TO TRACK EMPLOYEE PROGRESS

MyGlassClass.com courses are approved study material for  
AGMT Glazier Certification

**In-House Training to  
build YOUR Labor Force**

**NGA MEMBERS  
GET 50% OFF**



in Q1 2024, creating more stability and propagating single-family construction through late 2024 and 2025.

“The market needs lower interest rates for people to consider selling their homes that they refinanced when rates were low,” Lokar says.

## Multifamily Recalibration and increase for 2024

Multifamily work is expected to follow a similar pattern, dropping 13% by the end of 2023, with a 3% increase in 2024. Following a peak at the end of 2022, starts in this sector have declined, due in part to tightening credit standards for multifamily and commercial properties, as well as slowing household formation, with younger people cohabitating or living with family, lowering demand. Still, says Branch, this is simply a fall from the peak of activity. “[Before 2021], these are the highest levels for multifamily construction, going back to the ‘80s,” says Branch. “There’s still a lot of activity going on, so perhaps this is just a recalibration or a realignment following a little rush of development in 2021–2022.”

Companies that leaned into multifamily contracts during the sector’s boom of the last several years should prepare for slowdown in the near term, Lokar says. “If you’ve been living off multifamily, [the sector] is entering recession,” he says. “Starts were down 28.1% in the last quarter, and permit pulls have cratered.”

“Credit is hard to get for multifamily construction... that’s going to push up vacancy rates, and higher vacancy rates will suppress construction,” says Branch. “The point I want to make in multifamily is that even though the national market and some of the indicators are suggesting weakness, there are pockets of opportunity and growth in the multifamily space,” adds Branch. “I think that recovery [going into] 2024 is going to develop later for the multifamily market. Single family goes first, multifamily comes after.”

**“[THIS IS] AN OPPORTUNITY TO GET THE HOUSE IN ORDER. ... THINK ABOUT EVERYTHING YOU’VE SAID NO TO OVER THE PAST TWO OR THREE YEARS. THAT’S WHAT YOU CAN BRING BACK TO THE FRONT BURNER. TAKE ON THE BIG THINGS, LIKE AN INTERNAL SOFTWARE TRANSITION, TRAINING OR INVESTING IN YOUR BUSINESS.”**

Connor Lokar, Senior Forecaster, ITR Economics

## Extra resources for more insight



**Industry Metrics to Watch**



**A Recession Is Coming—Top 5 Factors to Watch**

## Extras

- The National Association of Home Builders projects that residential construction will drop 3.4% in 2024, single family will rise 3.7% in 2024, and multifamily will see a 17.3% decrease next year.
- Lokar believes that the single-family market is now bounding into

recovery, but that multifamily is heading for a tough year.

- Branch says consistent new home sales around the 700,000-unit range through the first nine months of this year are needed; currently it’s at about 684,000 units a month.
- FMI Corp. predicts the residential market will fall 7.1% in 2024; private multifamily could be down close to 20% by 2025.
- Dodge predicts infrastructure growth with a 13% rise in sewage and waste disposal and a 21% rise in water-supply systems, indicators that point to the demands of a growing population and a rise in new single-family and multifamily development.

## Eye on the horizon, sectors to watch

Energy advocates are keeping an eye on the 2024 U.S. election to inform how it may shape, or re-shape, energy transition policy. In its 2024 Engineering & Construction Industry Outlook, Deloitte believes that sustainable practices and technology advancements are likely to shape the industry in 2024, as key pieces of the Infrastructure Investment and Jobs Act, the Inflation Reduction Act, and the CHIPS Act flow into the industry. The U.S. is also prioritizing sustainable construction through its Federal Buy Clean Initiative, which specifies more than \$2 billion for the procurement of lower-carbon construction materials for use in federally funded projects.

Additionally, aviation projects are taking off. Large airport expansions in Colorado, Texas, Montana, Missouri, Iowa and Minnesota are boosted by cash infusions from the Infrastructure Investment and Jobs Act, which designates \$15 billion over five years for terminals, safety and sustainability efforts, and airport-transit connections. Of that, \$2.89 billion became available for airport projects in fiscal year 2023. ■



# SHIFT YOUR STRATEGY

GLASS PROCESSING AUTOMATION DAYS

GPAAD

**March 5-6, 2024**

Nashville  
[glass.org](http://glass.org)



# WE INSPECT YOUR GLASS

The Best in Class Inspection Solutions from Viprotron

## QUALITY SCANNER 3D – SUPERIOR PERFORMANCE

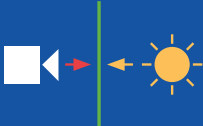
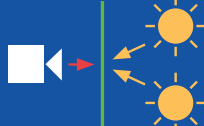

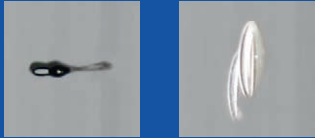


Viprotron’s unparalleled, industry-leading **three-channel approach** to glass defect detection has redefined quality in the glass industry. This advanced scanning system is designed for the most demanding applications - minimizing rejection rates and reducing costs. With three images of each defect, our patented software can distinguish and quantify each type of defect consistently and reliably. A state-of-the-art classification system enables detailed root cause analysis of defects.

The best way to outsmart your competition is to give your customers the smartest data. Viprotron does this for you with “AI” – **Actual Intelligence**. There is nothing “artificial” about collecting the most accurate glass defect data available. Our data, your quality recipe and Actual Intelligence provide the best glass quality your customers expect and deserve.

**Better data delivers better results.**



### WORKING PRINCIPLE – QUALITY SCANNER 3D

Illumination and detection channels	Brightfield channel transmission  Simulation of a bright diffuse sky	Darkfield channel transmission  Simulation of lateral sunlight	Brightfield channel reflection  Simulation of direct light reflection
Detection with special focus on:	 Defects with precise contour	 Defects low in contrast	 Coating defects

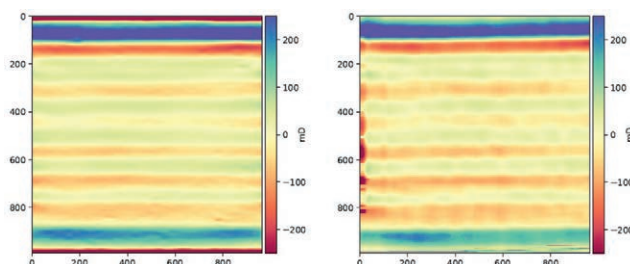


## TEMPER SCANNER 5D - THE NEW MILESTONE

Viprotron is proud to add a **new innovation** to its product range. Our strong focus on defect detection in insulated glass, has steadily expanded over the years to include cutting, fabrication, lamination and finally tempering.

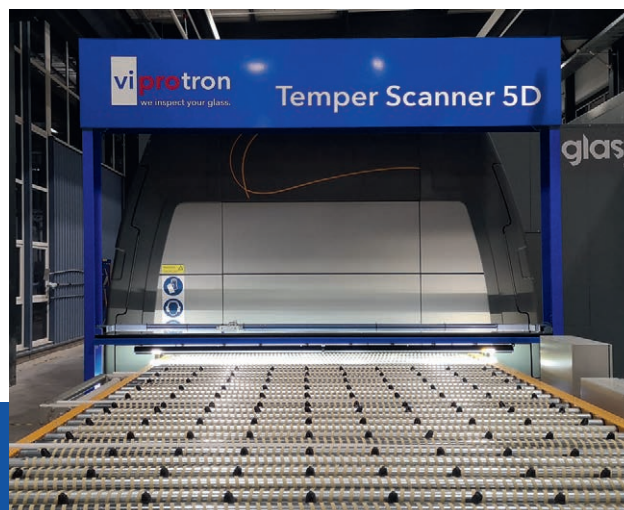
Now we are introducing new, advanced technology for improving tempering defect detection. We will enhance our award-winning Anisotropy + Haze Scanner by adding a **Roller Wave** and **Edge Kink Scanner** to our system. All five functions (Roller Wave/Edge Kink, Anisotropy, Haze, Brightfield & Reflection Channel for optical defects) are available in one complete package or as individual scanners.

Our new, innovative and patented technology is producing excellent results when compared to actual tactile measurements of Rollerwave and Kink distortion.



TACTILE MEASUREMENT

VIPROTRON



### REAL DATA = REAL INTELLIGENCE

Our glass inspection systems provide customers with the information that they need to improve their quality and processes. You can rely on Viprotron to provide the data you need to bring your glass quality to the higher level that your customers demand from you.

MEET US AT GPAD in NASHVILLE



MARCH 5-6, 2024  
PLATINUM SPONSOR

### CONTACT US TODAY

Viprotron North America Inc.

Cell: (313) 384 3855

Mail: [ric.schmidt@viprotron.com](mailto:ric.schmidt@viprotron.com)

[www.viprotron.com](http://www.viprotron.com)

# SPANCraft

## GLASS AND MIRROR

- TEMPERED GLASS TABLE TOPS
- LOW-IRON TABLE TOPS
- ANTIQUE MIRROR SHEETS™
- ANTIQUE MIRROR TILES
- LOW-IRON BACK PAINTED GLASS SHEETS
- COLOR MIRROR SHEETS
- TEMPERED SHOWER DOORS
- TEMPERED SPLASH GUARDS
- TEMPERED GLASS SNEEZE AND COUGH GUARDS

- TEMPERED SHOWER SHELVES
- BENT GLASS TABLE BASES
- TEMPERED GLASS SHELVES
- SHELF BRACKETS
- SHELF CLAMPS
- TRILOGY SLIDING HARDWARE
- SPANGUARD™ GLASS PROTECTOR
- FRAMELESS WALL MIRRORS





STOCK PROGRAM • 2024

## ANTIQUE MIRROR COLLECTION

OUR TRADEMARKED LINE OF ANTIQUED MIRRORS



**STOCK SIZES**

**48"x96" Sheets**

**19 PATTERNS**

**24"x48" Sheets**

- Complete set antiqued mirror samples available at a nominal charge
- Authentic antiqued variations in color and appearance
- Sheets are 3/16" (5mm) thick
- Each sheet individually cartoned with Styrofoam® protection
- Standard smooth mirror back for easy installation
- In stock ready to ship nationwide

**FULL COLOR CATALOG AND WHOLESALE PRICING AVAILABLE UPON REQUEST**

**WAREHOUSE & OFFICE: 71 INIP DRIVE, INWOOD, NY 11096**

**TEL: 516.295.0055 • FAX: 516.569.3333**

**SPANCRAFT.COM • INFO@SPANCRAFT.COM**

A **DGI** DENVER  
GLASS  
INTERIORS COMPANY  
— clear innovation —

# PRODUCTS



## KEY FEATURES

DURABLE CERAMIC FRIT INK

CUSTOM COLORS & OPACITIES

ENHANCED PRODUCTION & RESOLUTION CAPABILITIES

SIDE ONE PRINTING FOR BIRD-FRIENDLY APPLICATIONS

UV FADE & SCRATCH RESISTANT

## SOLUTION: ENHANCED ALICE® DIRECT-TO-GLASS PRINTING

GGI's Alice® Direct-to-Glass Printing is the perfect way to inject personality and color into any glass application like never before. Utilizing ceramic frit ink and Dip-Tech's enhanced printing technology, Alice® provides high-resolution designs combined with precision fabrication.

Choose from hundreds of standard designs available in GGI's Inspiration Gallery or furnish artwork unique to each project. All designs can be easily and cost-effectively customized to meet the needs of the smallest to largest project design, including bird-friendly

applications. Conductive and precious metal inks in gold and white gold are also available.

From transparent to fully opaque—and any opacity level in between—Alice® Direct-to-Glass Printing offers limitless possibilities to create unique designs with long-lasting durability. UV fade and scratch resistant, Alice® is perfectly suitable for both exterior and interior installations.

Collaborate with GGI to streamline the process of incorporating direct-to-glass printed designs into curtain walls and storefronts, glass railings, structural

glass wall systems, operable glass walls, and other glass applications.

Each direct-to-glass printed panel is digitally labeled and stored electronically to ensure the integrity of the design is maintained and the installation process runs smoothly.

Unlock your creative imagination and expand your fabricated glass

capabilities by partnering with GGI on your next decorative glass project.

To learn more, visit [generalglass.com](http://generalglass.com) or email [sales@generalglass.com](mailto:sales@generalglass.com). ■

SPONSORED CONTENT





01



02



03



### 01. Glass wall system

PurOptima's Revolution 100 is a dry-jointed system that can be single- or double-glazed, allowing the same visual appearance across a workspace while addressing varying acoustic requirements. Revolution 100 glass walls can be adapted between single- or double-glazed systems to accommodate changing design requirements. Modular in nature, these glass walls are reusable, and installers can safely demount, relocate and reinstall this glass wall solution time after time.

443/687-7173 | PUROPTIMA.COM

### 02. Sliding door system

The 690/695 Sliding Door System by C.R. Laurence is suitable for commercial and residential applications. The 690/695 Series features quiet operation. The amount of visible hardware is reduced, enabling the design of expansive, all-glass interior spans. An optional grid system is available for a distinct industrial look. This aluminum grid system can be cut to any length and is adhered horizontally or vertically to either the 690 or 695 for design flexibility.

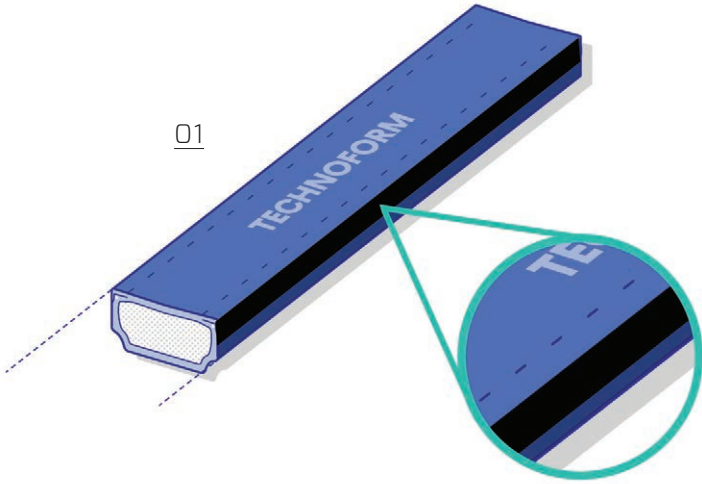
800/421-6144 | CRLAURENCE.COM

### 03. IGU sealer

Glaston's Active'Sealer is designed for automated insulating glass sealing. With a sealing speed of up to about 98 feet per minute, it caters to glass fabricators who primarily produce double IG units. Processing triple units is also possible. It comes with an optional 16-foot-long run-out conveyor equipped for the safe removal of heavy IGUs. Individual customization of the transport sections is also an option. It is available in three configurations.

856/840-4736 | GLASTON.NET

PRODUCTS



**01. Warm-edge spacer**

Designed for use in structural silicone glazing applications, the black sidewall of the Technoform SP25 spacer reduces the chance of steel visibility where there is not full coverage of the sidewall by primary polyisobutylene sealant. The new black sidewall spacer allows fabricators to ensure consistency of color at the edge, while achieving optimal thermal performance and durability, say company officials.

330/487-6600 | TECHNOFORM.COM

**02. Power hinge**

The Roto NX Power Hinge is designed for sash weights up to 440 pounds on tilt-and-turn windows and up to 660 pounds on turn-only windows. To prevent unintentional slamming of windows, Roto offers an anti-slam device in addition to the Roto NX Power Hinge. Designed for tilt-and-turn sashes with an opening width of 80 millimeters, it secures the sash in the tilt position, is retrofittable and comes with a special drilling jig.

860/526-4996 | ROTONORTHAMERICA.COM

**03. Business app**

Customer details, lead information and sales appointments entered into the Business Pilot system are pulled through to the Paradigm Vendo platform, ready for quoting and selling jobs virtually. Quote and sales information from Paradigm Vendo is then fed back to Business Pilot where contracts, finance, installation dates, purchase orders and stock can be managed.

+(33) 3050-7506 | BUSINESSPILOT.CO.UK





## Resources to meet your needs.

When it comes to glazing and glass building products, NGA is the authority and resource on all things technical. We offer in-depth manuals written and developed by industry experts for fabricators, glaziers and other industry professionals.

Order now at [glass.org/store](https://glass.org/store) or scan this QR code to get started.



**NGA**  
NATIONAL GLASS ASSOCIATION with GANA

# Suppliers Guide

## ARCHITECTURAL FINISHES

### POWDER COATING



FRAMELESS HARDWARE COMPANY  
THE GLASS SPECIALTY COMPANY  
EXPERIENCE AND INNOVATION

Frameless Hardware Company **NGA ADV**  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

## ARCHITECTURAL GLASS/FLAT GLASS

### GENERAL



American Insulated Glass **ADV**  
7 Regional Fabrication Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com



Benowitz International Glass Products, LLC **ADV**  
"The Pinnacle of Innovation"  
Phone: 702/885-4772  
E-mail: sales@benowitzinternationalglass.com  
www.benowitzinternationalglass.com



GGI **NGA 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



Global Security Glazing **NGA**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
**(See our ad on this page)**



Global Security Glazing  
**ISOCLIMA Specialty Glass**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
**(See our ad on this page)**



## 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. **ADV NGA**  
US: 866-OLDCASTLE (653-2278)  
www.obe.com

### ANTI-REFLECTIVE



GGI **NGA 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

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**

### BIRD-FRIENDLY

Glasswerks LA Inc. **ADV NGA**  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com

### BLAST RESISTANT



RAY-BAR USA **NGA**  
Security, Ballistic Glass and IGU's  
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@safti.com  
www.safti.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



Global Security Glazing **NGA**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
**(See our ad on this page)**

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



Riot Glass LLC **ADV**  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.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

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@safti.com  
www.safti.com



Technical Glass Products **NGA**  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

### BURGLARY 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



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

### CHEMICALLY STRENGTHENED



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 81)**

### 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**

## YOUR SOURCE FOR SECURITY AND SPECIALTY GLASS

LEARN MORE AT **ISOCLIMASG.COM**



### DISTRIBUTORS



American Insulated Glass **ADV**  
7 Regional Fabrication Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com



GGI **NGA 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

SGC International Inc.  
6489 Corvette Street  
Commerce, CA 90004  
US: 866/802-8682  
Phone: 323/318-2998  
Fax: 323/318-2999  
E-mail: sgcjames@yahoo.com; hennysgc@gmail.com  
www.sgc-usa.com  
**(See our ad on page 79)**

### FIRE-RATED



American Insulated Glass **ADV**  
7 Regional Fabrication Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com



GGI **NGA 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





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 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: 425/396-8300  
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

**FIRE-RATED:  
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



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 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: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

#### FLOORS

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



**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

**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)  
www.obe.com

#### HEAT SOAKED



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



Glasswerks LA Inc.  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.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)  
www.obe.com

#### HEAT-STRENGTHENED



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

**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

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

#### LAMINATED

Go to category **LAMINATED  
GLASS & EQUIPMENT**

#### LEAD

**Amerope Enterprises Inc.**  
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 USA  
Fastest X-Ray Glass and  
IGU's Available  
US: 800/444-XXRAY  
Fax: 800/333-XXRAY  
E-mail: sales@raybar.com  
www.raybar.com

#### LOW-EMISSION

Glasswerks LA Inc.  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.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

#### LOW IRON



American Insulated Glass  
7 Regional Fabrication  
Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com

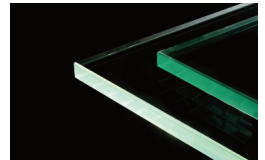
**Oldcastle BuildingEnvelope®**  
More Than 85 Manufacturing and  
Distribution Locations in 25 US  
States, 4 Canadian Provinces, 3  
European Countries and 3  
Australian States.  
US: 866-OLDCASTLE  
(653-2278)  
www.obe.com



**WWW.SGC-USA.COM**  
**GLASS DISTRIBUTION CENTER**

- Glass Products:**
- Clear Float Glass (1/16" - 1")
  - Tinted Float Glass (1/8" - 1/2")
  - Low iron clear glass (1/16" - 1")
  - Textured patterned Glass
  - Polished Wire Glass (UL Listed)
  - Laminated glass (Clear & White)
  - Tinted laminated glass
  - Copper free mirror (1/8", 3/16", 1/4")
  - Safety backing mirror (CAT II)
  - Antique mirror & Deco mirror
  - Satin etched glass
  - Pyrolytic low-e glass
  - Triple silver low-e glass
  - Tempered glass

**Your local glass warehouse and  
business partner. Thousands of  
cases of glass and mirrors in stock  
and ready to ship on-demand.**



6489 Corvette Street • Commerce, CA 90040  
email: sgciusa@gmail.com  
1-866-802-8682 • 323-318-2998

#### OVERSIZED



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

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



American Insulated Glass  
7 Regional Fabrication  
Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.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

# Suppliers Guide

## Olde Good Things

**WANTED:  
SALVAGED CHICKEN  
WIRE GLASS**

**Glaziers • Renovation Contractors  
Demolition Companies**

**If you come across Chicken  
Wire Glass, contact us.**

Please email quantities and sizes,  
along with pictures, to:

**glass@oldegoodthings.com.**

We also sell chicken wire glass and  
antique hand silvered mirror glass.

**Call Kathy at 570-341-7668**

**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**



www.obe.com

**GGI**

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 **NGA  
ADV**



### 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. **ADV  
NGA**



www.obe.com

### PRIVACY: ELECTRICALLY SWITCHABLE

**AMERICAN  
SWITCHGLASS**  
SWITCHABLE PRIVACY GLASS

American Switchglass  
63 Via Pico Plaza, Ste 104  
San Clemente, CA 92672  
US: 800/838-6088  
Phone: 949/254-6188  
E-mail: sales@  
americanswitchglass.com  
www.americanswitchglass.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

## SECURITY

**ISOCLIMA**  
Specialty Glass, LLC

**Global Security Glazing** **NGA**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
**(See our ad on page 78)**

**McGRORYGLASS  
DEFEND**

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



**RIOT GLASS**

Riot Glass LLC **ADV**  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.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@safti.com  
www.safti.com

## SILKSCREENED

**GLASSFAB  
TEMPERING SERVICES, INC.**

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**



www.obe.com

## SPANDREL

**American  
Insulated  
Glass**

American Insulated Glass **ADV**  
7 Regional Fabrication  
Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com

**GGI**

GGI **NGA  
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

**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. **ADV  
NGA**



**PRELCO**

Prelco Inc. **ADV**  
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

**American  
Insulated  
Glass**

American Insulated Glass **ADV**  
7 Regional Fabrication  
Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com

**GLASSFAB  
TEMPERING SERVICES, INC.**

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



Glasswerks LA Inc. **ADV  
NGA**  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.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

**PRELCO**

Prelco Inc. **ADV**  
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  
NGA**



## 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

**GLASSPOLIS**

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

## WIRED

**GGI**

GGI **NGA  
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

Olde Good Things **NGA**  
400 Gilligan St.  
Scranton, PA 18508  
US: 888/233-9678  
Phone: 570/341-7668  
Fax: 570/341-8104  
E-mail: og.tbz/vintageglass7  
**(See our ad on this page)**

## 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

**GLASSPOLIS**

Glassopolis **ADV**  
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 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

**TGP FIRE RATED**

**Technical Glass Products** **NGA**  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

**BATH ENCLOSURES  
& RELATED ITEMS**

## GENERAL





American Insulated Glass  
7 Regional Fabrication  
Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com



C.R. Laurence Co. Inc.  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com



Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.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



**ENCLOSURES: CURVED**



**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 this page)*



**ENCLOSURES: CUSTOM**



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



**ENCLOSURES: FRAMELESS**



Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com



Glasswerks LA Inc.  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com



**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.  
US: 866-OLDCASTLE  
(653-2278)  
www.obe.com



**HARDWARE**



**Benowitz International Glass Products, LLC**  
"The Pinnacle of Innovation"  
Phone: 702/885-4772  
E-mail: sales@benowitzinternationalglass.com  
www.benowitzinternationalglass.com



C.R. Laurence Co. Inc.  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com



Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com



**IGT Glass Hardware**  
5260 NW 167th St.  
Miami Gardens, FL 33014  
US: 877/545-7079  
E-mail: sales@igt-glasshardware.com  
www.glasshardware.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



Rockwell Security Inc.  
15083 Wicks Blvd.  
San Leandro, CA 94577  
Phone: 510/270-5633  
Fax: 309/276-2680  
E-mail:  
info@rockwellsecurityinc.com  
www.rockwellsecurityinc.com  
*(See our ad on this page)*

**SHOWER DOORS**



**Benowitz International Glass Products, LLC**  
"The Pinnacle of Innovation"  
Phone: 702/885-4772  
E-mail: sales@benowitzinternationalglass.com  
www.benowitzinternationalglass.com



C.R. Laurence Co. Inc.  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com



Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-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.  
US: 866-OLDCASTLE  
(653-2278)  
www.obe.com



**BENT GLASS**

**GENERAL**

**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)*



**Isoclima Specialty Glass**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
*(See our ad on page 78)*



**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 this page)*



Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
www.standardbent.com



**BENT/CURVED GLASS**



Glasswerks LA Inc.  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com



**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 this page)*



**DECORATIVE**



Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
www.standardbent.com



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



Clear, Tinted, Low-E,  
Reflective, Acid-Etch,  
Low-Iron or Specialty

Polished Edges, Holes,  
Notches, and Cutouts



**Precision Glass Bending**

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

**INSULATING**



**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 this page)*



**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

# Suppliers Guide



Fenestration software  
made simple

### EASILY CREATE

- Drawings • Reports
- Quotes • Cut Sheets

### FREE TRIAL

858.538.4375  
gdsestimating.com/try



Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
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 81)*



Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
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 81)*

### 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 81)*

### TEMPERED



**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 81)*

### TEMPERED/LAMINATED



Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
www.standardbent.com

### TEMPERED/LAMINATED



**Global Isoclima Specialty Glass**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
*(See our ad on page 78)*



**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 81)*



Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
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

### ESTIMATING

**GDS Storefront Estimating** NGA  
2033 San Elijo Ave. #221  
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 this page)*

### INVENTORY

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

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

### 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

MarketPro Point of Sale Solutions  
2372 Morse Ave., Ste. 674  
Irvine, CA 92614  
US: 888/616-3706  
E-mail: support@marketpropos.com  
www.marketpropos.com  
*(See our ad on this page)*

### PRICING

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

### 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



American Insulated Glass ADV  
7 Regional Fabrication  
Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com



Glasswerks LA Inc. ADV NGA  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com



McGrory 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**<sup>®</sup>  
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



Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
www.standardbent.com

### ACID ETCHED



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

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**<sup>®</sup>  
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



**CERAMIC FRIT:  
PATTERNED**



**BENOWITZ  
INTERNATIONAL  
Glass Products, LLC**

**Benowitz International Glass  
Products, LLC**  
"The Pinnacle of Innovation"  
Phone: 702/885-4772  
E-mail: sales@  
benowitzinternationalglass.com  
www.benowitzinternationalglass.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

**COLOR COATED**



**GGI** **NGA  
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

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**  
**EVALAYER**  
EVA films and more  
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

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



**SBG**  
Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
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** **NGA  
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

**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



**SBG**  
Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
www.standardbent.com

**LAMINATED**

**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



**SBG**  
Standard Bent Glass  
P.O. Box 65  
East Butler, PA 16029  
Phone: 724/287-3747  
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

**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 (PA): 800/352-0800  
US (FL): 800/780-5051  
Fax: 610/534-3202  
E-mail: cservice@strybuc.com  
www.strybuc.com

**ACCESS CONTROL**

**Frameless Hardware Company** **NGA  
ADV**  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

**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  
US: 800/759-9895  
Phone: 305/740-6252  
Fax: 305/740-6221  
E-mail: calusabarndoor@aol.com  
www.calusabarndoorhardware.com

**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**

**C.R. Laurence Co. Inc.** **ADV  
NGA**  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com

**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



**Kenwa Trading** **NGA**  
380 N. Broadway, Ste. 302  
Jericho, NY 11050  
Phone: 516/933-6016  
Fax: 516/933-6018  
E-mail: ktc@kenwa.net  
www.kenwa-america.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

**HANDLES**

**C.R. Laurence Co. Inc.** **ADV  
NGA**  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com



**Kenwa Trading** **NGA**  
380 N. Broadway, Ste. 302  
Jericho, NY 11050  
Phone: 516/933-6016  
Fax: 516/933-6018  
E-mail: ktc@kenwa.net  
www.kenwa-america.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**



**C.R. Laurence Co. Inc.** **ADV  
NGA**  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com



**Frameless Hardware Company** **NGA  
ADV**  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

**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

# Suppliers Guide

## 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

## RAILS



**Frameless Hardware Company** NGA  
ADV  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

## SLIDING GLASS DOOR

**C.R. Laurence Co. Inc.** ADV  
NGA  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.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

## 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 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



## GENERAL



**GGI** NGA  
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

**McGrory Glass Inc.** ADV  
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

## ALUMINUM

**C.R. Laurence Co. Inc.** ADV  
NGA  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.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

## 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.  
US: 866-OLDCASTLE  
(653-2278)  
www.obe.com

## BIFOLD

**C.R. Laurence Co. Inc.** ADV  
NGA  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com

## BLAST RESISTANT



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

## BULLET RESISTANT

**McGrory Glass Inc.** ADV  
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** NGA  
Security, Ballistic Glass and  
IGU's  
US: 800/444-9729  
Fax: 800/333-9729  
E-mail: sales@raybar.com  
www.raybar.com

## ENTRANCE SYSTEMS: METAL

**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

## FIRE-RATED



**McGrory Glass Inc.** ADV  
NGA  
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



**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** 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



**Technical Glass Products** NGA  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
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

## GLASS

**McGrory Glass Inc.** ADV  
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

## RAILINGS



**Benowitz International Glass Products, LLC** ADV  
NGA  
"The Pinnacle of Innovation"  
Phone: 702/885-4772  
E-mail: sales@benowitzinternationalglass.com  
www.benowitzinternationalglass.com



**C.R. Laurence Co. Inc.** ADV  
NGA  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com



**IGT Glass Hardware**  
5260 NW 167th St.  
Miami Gardens, FL 33014  
US: 877/545-7079  
E-mail: sales@igt-glasshardware.com  
www.glasshardware.com

## SAFETY GLASS

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

## SECURITY



**Global Security Glazing** NGA  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
See our ad on page 78)

**McGrory Glass Inc.** ADV  
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  
Security, Ballistic Glass  
and IGU's  
US: 800/444-9729  
Fax: 800/333-9729  
E-mail: sales@raybar.com  
www.raybar.com



## RIOT GLASS

Riot Glass LLC  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.com

ADV

## TGP FIRE RATED

Technical Glass Products  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

NGA

## 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

ADV  
NGA

## SIDELITES

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

## SLIDING GLASS

C.R. Laurence Co. Inc.  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@claurence.com  
www.claurence.com

ADV  
NGA

## STOREFRONTS & ENTRANCES

## CRL

C.R. Laurence Co. Inc.  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@claurence.com  
www.claurence.com

ADV  
NGA

## FHC

FRAMELESS HARDWARE COMPANY  
THE GLAZING SUPPLY COMPANY  
EXPERIENCE AND INNOVATION

Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

NGA

ADV

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

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

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

## TEMPERED GLASS DOORS

Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

NGA  
ADV



Glasswerks LA Inc.  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com

ADV  
NGA

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

## SAFTIFIRST

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

## 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 EVALAYER

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

## 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

## SAFETY & SECURITY

## INTERLAYER SOLUTIONS EVALAYER

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

## RIOT GLASS

Riot Glass LLC  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.com

ADV

## WATER RESISTANT PROTECTIVE

## INTERLAYER SOLUTIONS EVALAYER

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

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.smarttrigcranes.com

## HANDLING EQUIPMENT



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

## HOISTING

## MICROCRANES

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.smarttrigcranes.com

## GLASS TOOLS & SUPPLIES

## GENERAL

## CRL

C.R. Laurence Co. Inc.  
2503 E. Vernon Ave.  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@claurence.com  
www.claurence.com

ADV  
NGA

## ERGO ROBOTIC SOLUTIONS

## 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

## FHC

FRAMELESS HARDWARE COMPANY  
THE GLAZING SUPPLY COMPANY  
EXPERIENCE AND INNOVATION

Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

NGA

## BITS: DIAMOND

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, ACCESSORIES AND SERVICE

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

NGA

# Suppliers Guide

## FABRICATING EQUIPMENT SPECIALIST

**MUNTIN/SPACER RADIUS FORMER  
COMPUTERIZED/PNEUMATIC NOTCHERS  
SUNBURST LAYOUT TABLE SYSTEM  
SAWS-BLADES  
MUNTIN/SPACER PUNCHES  
FISHMOUTH EQUIPMENT**



**EQUIPMENT & SUPPLY**  
734-459-5870 FAX 734-459-9837  
WWW.MCKEEGANEQUIP.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

## 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: DIAMOND

**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



**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



**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



**American Insulated Glass** ADV  
7 Regional Fabrication Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.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



**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

**Glasswerks LA Inc.** ADV  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.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  
(See our ad on this page)



**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)  
www.obe.com



**Prelco Inc.**  
94 Cartier Blvd. NGA  
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

## AIR SPACERS

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

## EQUIPMENT: OVENS

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

## MUNTIN BARS

**Helima Helvetion International Inc** NGA  
P.O. Box 1348  
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 Australian States. ADV  
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 Australian States. ADV  
US: 866-OLDCASTLE (653-2278)  
www.obe.com

## INTERIOR OFFICE PARTITIONS

## DEMOUNTABLE

**C.R. Laurence Co. Inc.** ADV  
2503 E. Vernon Ave. NGA  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@claurence.com  
www.crlaurence.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  
US: 866-OLDCASTLE (653-2278)  
www.obe.com

## FRAMELESS



**Frameless Hardware Company** NGA  
4361 Firestone Blvd. ADV  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

## LAMINATED GLASS & EQUIPMENT

### GENERAL



**American Insulated Glass** ADV  
7 Regional Fabrication Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.com

**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



**Glasswerks LA Inc.** ADV  
8600 Rheem Ave. NGA  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com



**Global Security Glazing** NGA  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
See our ad on page 78)



**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



**Isoclima Specialty Glass**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
See our ad on page 78)

**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



Prelco Inc.  
94 Cartier Blvd.  
Riviere-du-Loup, GQ 5SR 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**  
506 Airport Executive Park  
Nanuet, NY 10954  
Phone: 845/354-2010  
Fax: 845/547-0328  
E-mail:  
sales@cassosolartechnologies.com  
www.cassosolartechnologies.com



**EQUIPMENT:  
AUTOMATED**

**Casso-Solar Technologies**  
506 Airport Executive Park  
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**  
506 Airport Executive Park  
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**  
506 Airport Executive Park  
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**  
506 Airport Executive Park  
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 Australian States.  
US: 866-OLDCASTLE (653-2278)  
www.obe.com



**Riot Glass LLC**  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.com



**HURRICANE GLASS**

**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



**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



**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



**Riot Glass LLC**  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.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**  
506 Airport Executive Park  
Nanuet, NY 10954  
Phone: 845/354-2010  
Fax: 845/547-0328  
E-mail:  
sales@cassosolartechnologies.com  
www.cassosolartechnologies.com



**Erdman Automation**  
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



**FGE Solutions**  
1457 Kelly Rd. Suite 360  
Apex, NC 27511  
Phone: 336/259-3853  
Email: Sales@FGESolutions.com  
Web: FGESolutions.com



**ASSEMBLY**

**Mueller TB Technologies AG**  
Laubisruetistrasse 72  
CH-8712 Staefa  
Switzerland  
Phone: 905/427-3400  
Fax: +41-44-926-6774  
E-mail: info@ejindustries.ch  
www.mueller.ch  
*(See our ad on this page)*



**BENDING**



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



**BEVELING**



**Lattuada North America Inc.**  
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.  
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 Machine Company**  
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



**Jordon Glass Machinery**  
OUR TOP SELLER  
D3MGL - POLISHER W/ MITER  
TOP MACHINERY OF 2022  
CNC CUTTING TABLES  
CHEMICAL TEMPERING OVEN  
TEMPERING FURNACE  
GLASS WRAPPING MACHINES  
WATER FILTRATING SYSTEMS  
HUGE SELECTION OF MACHINES & TONS OF SPARE PARTS AVAILABLE  
WWW.JORDONGLASS.COM  
SALES@JORDONGLASS.COM  
(305) 482-0116

**COATING**



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



# Suppliers Guide



**MÜLLER TECHNOLOGIES**

Are you going to start producing thermally insulated profiles or do you need to extend your current production drastically? As the leading manufacturer for Thermal Break Assembly Lines we can offer you fully automated lines as well as basic equipment to start your production.

We also manufacture other equipment for aluminum profiles, such as protection taping machines, gasket inserting devices, shear force testing units and other useful components.

**Müller TB Technologies | +41 44 926 44 88**  
sales@muller.ch | www.muller.ch

## 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.  
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.

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**  
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.

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

**FGE Solutions**  
1457 Kelly Rd. Suite 360  
Apex, NC 27511  
Phone: 336/259-3853  
Email: Sales@FGESolutions.com  
Web: FGESolutions.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



Lattuada North America Inc.  
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

## FURNACES

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

## LEHR'S

**Casso-Solar Technologies**  
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**  
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**  
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

## 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

## SEAMING

**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

## SPRAYING

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

## TEMPERING



**Jordon Glass Machinery**  
6320 NW 99th Ave.  
Doral, FL 33178  
US: 800/833-2159  
Phone: 305/482-0116  
Fax: 305/482-0119  
www.jordonglass.com  
(See our ad on page 87)



Xinglass (Hangzhou Glass Technology Co., Ltd.)  
4445 Corporation Lane, Ste. 264  
Virginia Beach, VA 23462  
US: 800/868-0307  
Phone: 302/489-9583  
Fax: 302/231-2195  
E-mail: sales@xinglassamerica.com  
www.xinglass.com  
www.xinglassamerica.com

## V-GROOVING



**Glasswerks LA Inc.**  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com

## VACUUM CUPS



Better Vacuum Cups  
13841 Roswell Ave., Ste. K  
Chino, CA 91710  
US: 877/872-2821  
Phone: 909/606-0140  
E-mail: orders@greenBVC.com  
www.GreenBVC.com

## VACUUM TABLE HOLDDOWN/FLOTATION



Better Vacuum Cups  
13841 Roswell Ave., Ste. K  
Chino, CA 91710  
US: 877/872-2821  
Phone: 909/606-0140  
E-mail: orders@greenBVC.com  
www.GreenBVC.com

## WASHING



LaLattuada North America Inc.  
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

## WATER JET CUTTING

**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

## METAL PRODUCTS

## GENERAL



**Niles Aluminum Products**  
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

## 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  
US: 866-OLDCASTLE (653-2278)  
www.obe.com

## ALUMINUM EXTRUSIONS: BULLET RESISTANT



**Riot Glass LLC**  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.com

## BENDING EXTRUSIONS



**Niles Aluminum Products**  
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

**MIRRORS &  
RELATED PRODUCTS**

**GENERAL**



**American Insulated Glass** **ADV**  
7 Regional Fabrication  
Locations in the US  
US: 866/519-1565  
Phone: 404/361-9154  
E-mail: sales@aiglass.com  
Web: www.aiglass.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

**ANTIQUÉ**



**GGI** **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

**DECORATIVE**



**Glasswerks LA Inc.** **ADV**  
8600 Rheem Ave. **NGA**  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.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

**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**  
US: 866-OLDCASTLE **NGA**  
(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**  
US: 866-OLDCASTLE **NGA**  
(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**  
US: 866-OLDCASTLE **NGA**  
(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**  
US: 866-OLDCASTLE **NGA**  
(653-2278)  
www.obe.com

**SEALANTS & ADHESIVES**

**SILICONE**

**C.R. Laurence Co. Inc.** **ADV**  
2503 E. Vernon Ave. **NGA**  
Los Angeles, CA 90058  
US: 800/421-6144  
E-mail: crl@crlaurence.com  
www.crlaurence.com

**SERVICES**

**CONSULTING**



**Sole Source Consultants**  
Custom solutions for marketing and  
brand growth.  
E-mail: max@solesource.info  
www.solesourceconsultants.com

**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

**RECYCLING**

**repurposedMATERIALS**  
13505 E. 112th Ave.  
Brighton, CO 80603  
US: 877/282-8733  
Phone: 303/521-1471  
E-mail: damon@  
repurposedmaterialsinc.com  
www.repurposedmaterialsinc.com  
**(See our ad on this page)**

**STAFFING NEEDS**

**HoLampCo International**  
5825 Ellsworth Ave.  
Pittsburgh, PA 15232  
US: 800/875-6268  
Phone: 412/954-0000  
Fax: 412/954-0030  
E-mail: patti@hlcinternational.com/  
gary@hlcinternational.com  
www.holampcoresources.com  
**(See our ad on this page)**

**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**  
US: 866-OLDCASTLE **NGA**  
(653-2278)  
www.obe.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**  
US: 866-OLDCASTLE **NGA**  
(653-2278)  
www.obe.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**  
US: 866-OLDCASTLE **NGA**  
(653-2278)  
www.obe.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**  
US: 866-OLDCASTLE **NGA**  
(653-2278)  
www.obe.com

repurposedMATERIALS

**WANTED:  
GLASS**

... used, surplus or  
obsolete inventories  
of tempered and  
insulated glass panels.

**Call Damon  
303/321-1471**

repurposedMATERIALS

**SPECIALTY GLASS  
PRODUCTS**

**GENERAL**

**GLASSPOLIS**

**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

**Glasswerks LA Inc.** **ADV**  
8600 Rheem Ave. **NGA**  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.com

**HLC** **SM**  
International  
**HoLampCo International**

Our team of professional "headhunters"  
has been dedicated to servicing the talent  
in the façade world since 1982

**Patti Lamp, Managing Partner**  
Patti@hlcinternational.com  
(O) 412.954.0000 or  
(C) 412.656.6904

**Gary Holupka, PE,  
Managing Partner**  
Gary@hlcinternational.com  
(O) 412.954.0000 or  
(C) 412.656.6903

**www.holampcoresources.com**  
**We welcome your call.**

# Suppliers Guide



**Global**  
Specialty Glass  
**Isoclima Building Glass**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
**See our ad on page 78)**

## WOOD STOVE REPLACEMENT



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



**Technical Glass Products**  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

## STOREFRONTS & CURTAINWALLS

### GENERAL



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



**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

### CURTAINWALLS

**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@safti.com  
www.safti.com



**Technical Glass Products**  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
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.  
US: 866-OLDCASTLE (653-2278)  
www.obe.com

### ENTRANCES: CLADED



All Metal Specialties  
300 Livingston Avenue  
Jamestown, NY 14701  
US: 800/766-9141  
Phone: 716/664-6009  
Fax: 716/483-0575  
E-mail: bill@allmetalspecialties.com  
joe@allmetalspecialties.com  
www.allmetalspecialties.com

### ENTRANCES: CUSTOM

**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

### 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

## STOREFRONTS & ENTRANCES



Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com



Glasswerks LA Inc.  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.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



**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

**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



**Technical Glass Products**  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

## STOREFRONTS & ENTRANCES: SECURITY



**Global Security Glazing**  
500 Grant Ave.  
PO Box 739  
East Butler, PA  
U.S.: 866/412-6977  
E-mail: sales@isoclimasg.com  
www.isoclimasg.com  
www.security-glazing.com  
**See our ad on page 78)**

**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



Riot Glass LLC  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.com

## THERMAL BREAK STRUT

Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

## WINDOW HARDWARE & RELATED PRODUCTS

### GENERAL

Strybuc Industries  
2006 Elmwood Ave.  
Building 102-C  
Sharon Hill, PA 19079-0767  
US (PA): 800/352-0800  
US (FL): 800/780-5051  
Fax: 610/534-3202  
E-mail: cservice@strybuc.com  
www.strybuc.com

### SCREENS & COMPONENTS



Frameless Hardware Company  
4361 Firestone Blvd.  
South Gate, CA 90280  
US: 888/295-4531  
Phone: 323/968-2031  
Fax: 323/336-8307  
E-mail: info@fhc-usa.com  
www.fhc-usa.com

## WINDOWS

### GENERAL



Glasswerks LA Inc.  
8600 Rheem Ave.  
South Gate, CA 90280  
US: 888/789-7810  
Phone: 323/774-7373  
E-mail: johnm@glasswerks.com  
www.glasswerks.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

## 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.lgm.net  
**(See our ad on page 91)**

**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

## ARCHITECTURAL

**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

## 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.  
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@safti.com  
www.safti.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



## BULLET 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



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



Riot Glass LLC  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.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

**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

## 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.  
US: 866-OLDCASTLE  
(653-2278)  
www.obe.com

## FIRE-RATED



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



**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: 425/396-8300  
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

## FIXED

**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

## 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.  
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@safti.com  
www.safti.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

## 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



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



**Technical Glass Products**  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

## LEAD X-RAY

**Amerope Enterprises Inc.**  
150 Commerce Rd.  
Boynton Beach, FL 33426  
US: 800/327-3320  
Phone: 561/737-3720  
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 USA  
Fastest X-Ray Glass  
and IGU's Available  
US: 800/444-XYRAY  
Fax: 800/333-XYRAY  
E-mail: sales@raybar.com  
www.raybar.com

## NUCLEAR SHIELDING

**Amerope Enterprises Inc.**  
150 Commerce Rd.  
Boynton Beach, FL 33426  
US: 800/327-3320  
Phone: 561/737-3720  
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

## SECONDARY GLAZING



Riot Glass LLC  
17941 Brookshire Ln.  
Huntington Beach, CA 92647  
US: 800/580-2303  
Phone: 714/904-1030  
E-mail: brad@riotglass.com  
www.riotglass.com

## 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



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



**Technical Glass Products**  
8107 Bracken Place SE  
Snoqualmie, WA 98065  
Phone: 800/426-0279  
Fax: 425/396-8300  
E-mail: sales@fireglass.com  
www.fireglass.com

## SINGLE HUNG

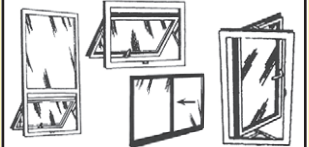
**Oldcastle BuildingEnvelope®**  
More Than 85 Manufacturing and  
Distribution Locations in 25 US  
States, 4 Canadian Provinces, 3  
European Countries and 3  
Australian States.  
US: 866-OLDCASTLE  
(653-2278)  
www.obe.com

## Liberty Glass & Metal Industries

Toll free: 800-843-2031  
estimating@lgminc.net  
www.lgminc.net



## 2" Projected Window Systems Specifically Designed for Commercial Applications



Commercial Rated Windows

## SPECIALTY

**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

## 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.  
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@safti.com  
www.safti.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

To place a listing or display ad in the Suppliers Guide, email Tim O'Connell at [toconnell@glass.org](mailto:toconnell@glass.org).

## Reader Response Center

Advertiser	Page	Phone	Website or email address
Aluflam	40	562/926-9520	aluflam-usa.com
BEC Conference 2024	95	703/442-4890 ext. 178	glass.org
Bromer, Inc.	41	450/477-6682	bromerinc.com
BVB Architectural Products	14, 26		bvbproducts.com
C.R. Laurence Company, Inc.	9	800/421-6144	email: showers@crlaurence.com
C.R. Laurence Company, Inc.	96	800/421-6144	email: entrance.partitions@crlaurence.com
Cardinal Glass Industries	42-43, 44-45		cardinalcorp.com
Curved Glass Distributors	81	888/288-9129	curvedglasscreations.com
Dependable Glass Works	65	800/338-2414	dependableglass.com
Erdman Automation Corp.	7	763/389-9475	erdmanautomation.com
Ergo Robotic Solutions	10-11, 85	518/796-2179	ergorobotic.com
F. Barkow, Inc.	37	800/558-5580	barkow.com
FHC, The Glazing Supply Company	2	888/295-4531	fhc-usa.com
GDS Estimating	82	858/538-4375	gdsestimating.com
GGI	23	800/431-2042	generalglass.com
Glass Magazine Employment Center	93		https://jobs.glassmagazine.com
Glass Processing Automation Days	69	703/442-4890 ext. 178	glass.org
Glassfab Tempering Services, Inc.	30-31	800/490-3860	glassfabusa.com
Glasswerks LA Inc.	3	888/789-7810	glasswerks.com
Global Security Glazing/Isoclima	78	866/412-6977	isoclimasg.com / security-glazing.com
GuangDong Kin Long Hardware Products Co., Ltd.	25		email: mail@kinlong.com
HoLampCo International	89	800/875-6268	holampcoresources.com
Jordon Glass Machinery	87	800/833-2159	jordonglass.com
Joseph Machine Co.	27	717/432-3442	josephmachine.com
Liberty Glass & Metal Industries	91	800/843-2031	lgminc.net
Magid	33	800/867-1083	magidglove.com
McKeegan Equipment & Supply	86	734/459-5870	mckeeganequip.com
Mueller Technologies AG	88	905/427-3400	muller.ch
MyGlassClass ONline Training	67	703/442-4890 ext. 196	myglassclass.com
MyGlassTruck	24	800/254-3643	myglasstruck.com
NGA Publications	77	703/442-4890 ext. 127	glass.org/store
North American Contractor Certification	61		naccprogram.com
Olde Good Things	80	888/233-9678	oldegoodthings.com
Orchard Lock	35	800/233-2146	orchardlock.com
PAC-CLAD   Petersen Aluminum	39	800/722-2523	pac-clad.com
Pilkington North America, Inc.	54-55	800/221-0444	pilkington.com/na
Precision Glass Bending Corp.	34, 81	800/543-8796	e-bentglass.com
repurposedMATERIALS	89	303/321-1471	repurposedmaterialsinc.com
Roto North America	5		rotonorthamerica.com
Salem Fabrication Technologies Group Inc.	20-21	800/234-1982	email: info@salemftg.com
Seclock	19	800/847-5625	seclock.com
SGC International Inc.	79	866/802-8682	sgc-usa.com
Spancraft	72-73	516/295-0055	spancraft.com
Vetrotech Saint-Gobain	51		vetrotech.com
Viprotron North America Inc.	70-71	313/384-3855	email: ric.schmidt@viprotron.com
Viracon	15		viracon.com
Vitro Architectural Glass	28-29		vitroglazings.com/solarban
Wood's Powr-Grip	63		wpg.com
XYG North America	53	905/947-8801	xygna.com
YKK AP America, Inc.	59		ykkap.com



# ATTENTION JOB SEEKERS

Use the Glass Magazine Employment Center to Help Find Your Next Job in the Architectural Glass Industry

The screenshot shows the Glass Magazine Employment Center website. At the top, there are tabs for 'Job Seeker' and 'Employer'. Below this is a navigation bar with 'HOME', 'JOBS', 'YOUR PROFILE', and 'RESOURCES'. On the right, there are links for 'Help' and 'Sign In'. The main header features a large image of people in a modern office with a city view, overlaid with the text 'Glass Magazine Employment Center'. Below the header is a search bar with 'Keywords' and 'Location' fields, and a search button. An 'Advanced Search' link is also present. The main content area is titled 'Glass Magazine Employment Center Account Benefits' and includes three icons: 'Post Your Resume', 'Apply For Jobs', and 'Get Job Alerts', followed by a large blue 'Get Started!' button. Below this, there are statistics: '6 Job Listings' and '4 Employers Hiring'. A 'Featured' tab is selected, showing a job listing for 'Project Manager II' at ' Fargo Glass & Paint Co.' in 'Minot, North Dakota'. A 'See More Listings' button is below the listing. The bottom section is titled 'Glass Magazine Employment Center Resources' and features a 'Career Learning Center' icon.

Visit [jobs.glassmagazine.com](https://jobs.glassmagazine.com) to learn more!

Industry Spotlight profiles people across the glass and glazing industry, showing off the work of individuals while demonstrating the range of exciting careers in glass. To suggest someone to profile, write to Senior Editor Norah Dick, [ndick@glass.org](mailto:ndick@glass.org).

# USING SOCIAL MEDIA TO AMPLIFY YOUR TRADE SHOW PRESENCE

BY ANDREW HARING

Trade shows are a sizeable investment to exhibit at and to attend. But when you factor in the opportunities presented, it's priceless in terms of value to your company and individual career. So, how can you leverage and capitalize on said investment?

## Getting "social"

Take a look at the free tools that exist to maximize the commitment you've already made. You can do this through the avenues you're already scrolling through, like LinkedIn, and disseminate that across other channels you or your marketing team are already using, like Twitter (X), Facebook, TikTok and Instagram.

"We view social media as a marketplace of ideas. Across all social platforms, we're able to provide valuable information that supports our initiatives. Social media does not live in a vacuum but when used strategically, social content will bring new leads to your door," says Crista Tekstra, vice president of brand and product marketing, C.R. Laurence.

## The pregame

Let people know ahead of time that you'll be under the same roof. This is your chance to meet people face-to-



face. Tell them you'll be there and what your intentions are. That could be a corporate email blast with a free promo code, or a direct outreach/ping just to let people know you'll be in the vicinity.

If you have a product to show, blast it on social media to let people know you're going, and what solution you have to offer or are seeking. You'll either connect with people already planning to be there more efficiently, or you might sway folks that weren't planning to be there to show up.

## During and after the show

You're now boots on the ground and ready to mingle and conduct business. Post something on your platform of choice and let folks know where you are in the building. Whether it's at a specific booth, food vendor or main entrance, be findable. They won't set an appointment if they don't know you're there. Build and cultivate that genuine rapport so that transactions can happen from a place of familiarity and trust. But first, make your presence known and be easy to locate.

After the show, reinforce those connections with follow-through. If you shook a hand or snagged a

business card, follow up. Reiterate that it was awesome meeting them at the show, include details specific to the interaction, and ask questions or deliver the info you said you would.

## Best practices

Throughout the show, share content that is relatable, informative and actionable. People love seeing projects and processes they can relate to.

Cite your sources and tag/attribute accordingly and selectively, and don't plagiarize. Give credit where it's due, but too many tags will stunt your social performance. Random tagging is clunky and will bury your post.

Prioritize quality over quantity. Don't post bland content for the sake of posting daily, and don't get hung up on trying to be an influencer. Be authentic and communicate clearly about the things you know.

"Having a strategy or niche that allows you to create fresh content, differentiate yourself and become a thought leader are great ways to utilize the benefits of social media," says Syndi Sim, vice president of marketing and business development, Diamond-Fusion International. ■



# GLAZING EVOLVED.



**BEC**  
CONFERENCE

**March 3-5, 2024**  
Nashville  
[glass.org](http://glass.org)





©Benjamin Benschneider

# Seamlessly Define Interiors

**Project:** Seyfarth Law Offices  
**Architect:** TVA Architects  
**Products:** Cascade Glass Partition System

CRL offers a comprehensive line of **glass partition systems** that can transform interiors to improve daylighting, transparency, acoustic privacy, and aesthetics.

- Framed, semi-framed, and frameless systems
- Bifolding, sliding, and stacking movable walls
- Double-glazed systems with high STC ratings
- Full selection of doors and door hardware
- Multitude of finishes including matte black



800.421.6144 • [crlaurence.com](http://crlaurence.com)  
[entrance.partitions@crlaurence.com](mailto:entrance.partitions@crlaurence.com)

