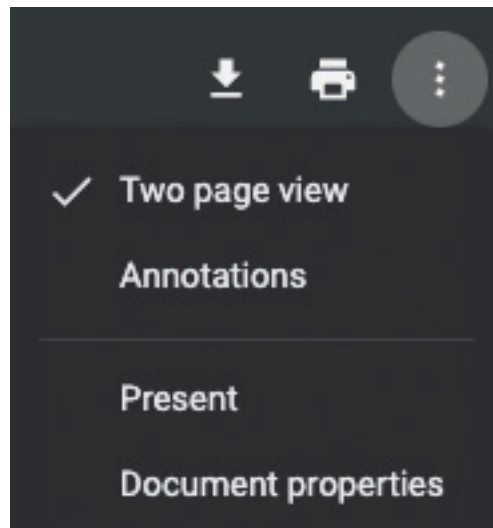


WINDOW + DOOR

**Welcome to the digital edition of
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A woman with long blonde hair, wearing a cream-colored dress with a black floral pattern, stands in a kitchen. She is reaching towards a large white ceramic vase filled with white hydrangeas. The vase sits on a white marble countertop next to a kitchen sink with a gold faucet. The kitchen features light blue cabinets with gold hardware. A window with a dark frame is visible in the background.

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42. The List

North America's largest manufacturers of residential windows, doors, skylights and related products, based on sales volume. *Compiled by Rachel Vitello*

On the Cover: This year's Top Manufacturer's Report once again demonstrates the ability of the fenestration market to grow and innovate even in the face of inflation and labor challenges. Photo courtesy of Centra Windows

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Vinyl's Sustainability

The industry is amplifying vinyl's sustainable attributes through LCAs, post-consumer recycling and more

BY LAURIE COWIN



One of my earliest jobs in publishing was for a magazine dedicated to green building materials and practices. Green building was still a trend. Sustainability was a hot buzzword that would grab an editor's attention.

Today, sustainability and environmental responsibility have long since moved from being a "trend" to being just part of how business is done. The 2024 Top Manufacturers Report, starting on p. 30 of this issue, reflects that. Energy efficiency is still a top-requested product feature. Not only are customers interested in making their homes energy efficient, but many are also environmentally conscious themselves and value companies and products that demonstrate sustainable practices.

The Top Manufacturers Report also shows, once again, that vinyl products are the bread and butter for most companies. So, it stands to reason that the vinyl industry is taking a hard look at sustainability. Several efforts are underway to amplify vinyl's sustainable attributes.

First, six Fenestration and Glazing Industry Alliance members are working to create an industry-wide Life Cycle Assessment for the vinyl industry. Any producer of certified vinyl products will be able to use the LCA as an input for vinyl window and door product Environmental Product Declaration generation. Sixteen facilities are undergoing a four-week, 32-week process in which nine tasks will yield deliverables for a published EPD. These member companies represent more than 30% of the vinyl windows market, providing a good view of the whole, writes Janice Yglesias, FGIA executive director, on windowanddoor.com.

Second, is a post-consumer window recycling pilot program underway with the Vinyl Institute of Canada and its Window Profile Recycling Task Group. While post-consumer vinyl recycling is commonplace in Europe, it has yet to reach North America. "We already, as an industry in North America, recycle about 1.1 billion pounds of post-industrial vinyl annually," explains Tony Vella, board chair of the Vinyl Institute of Canada. "The technology exists to take scrap vinyl, grind it up and reuse it in new products. We're not creating any infrastructure at this point; we're just connecting the dots of what's already there."

Of course, sustainability doesn't come from a single material. Glass, aluminum, wood, composites, components, other materials and the processes that go into creating windows and doors all contribute to the holistic process necessary to being truly sustainable. Visit WindowandDoor.com/sustainability for full coverage about sustainability in the industry. ■

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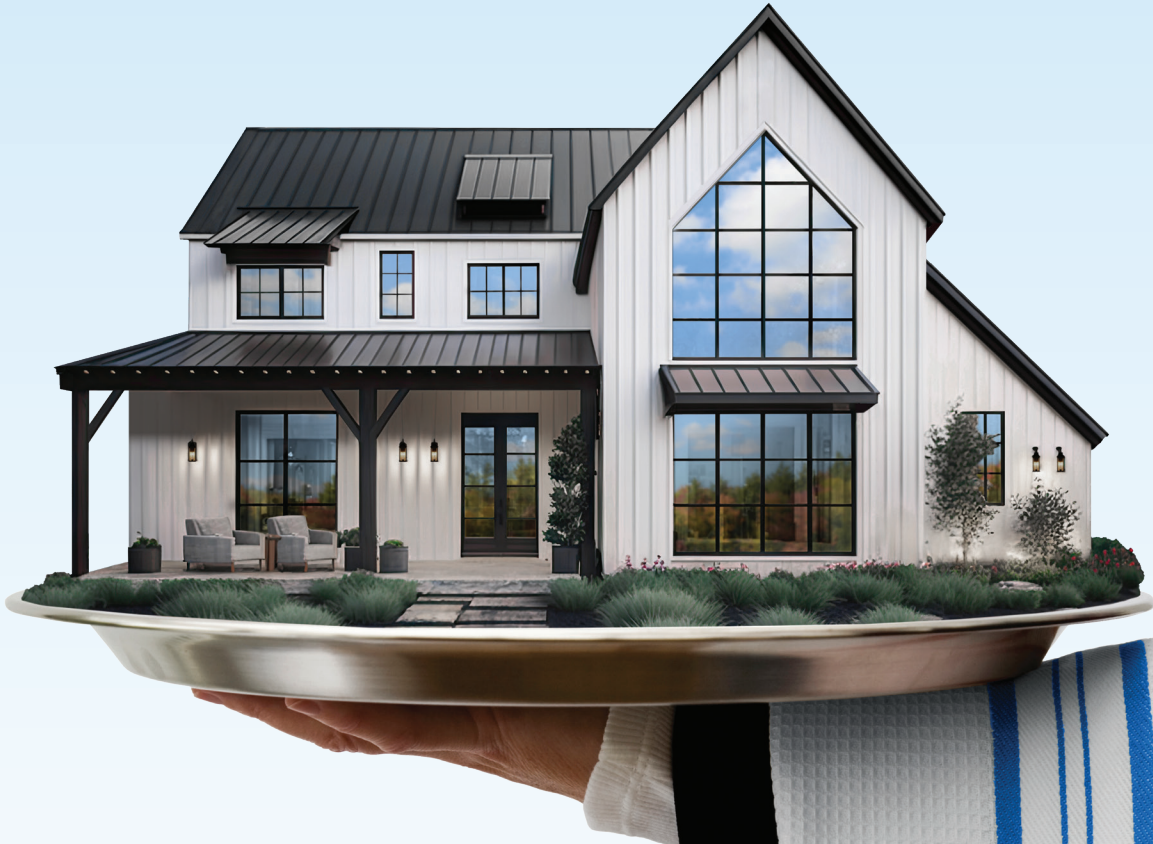
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Cornerstone Building Brands to Acquire Harvey Building Products

Cornerstone Building Brands Inc. reached an agreement to acquire Harvey Building Products and its portfolio of brands. This strategic acquisition hopes to increase Cornerstone Building Brands' exposure to the repair and remodel end market and strengthen its offering in distribution and dealer channels, adding more products to its portfolio. Cornerstone Building Brands expects the transaction to be accretive through purchasing synergies and revenue growth opportunities. The transaction, subject to regulatory approval and customary closing conditions, is expected to close in the second quarter of 2024.

PGT Innovations Stockholders Approve Merger with Miter Brands

PGT Innovations Inc.'s stockholders voted to approve the definitive merger agreement with Miter Brands and an amendment to the Amended and Restated Certificate of Incorporation of the Company at a special meeting of the company's stockholders. As previously announced, under the definitive merger agreement, Miter Brands will acquire all outstanding shares of PGTI common stock for \$42 per share in cash.

YKK AP America Opens Los Angeles Sales and Manufacturing Center

YKK AP America opened its doors to a new sales and manufacturing center in Rancho Cucamonga, California. The facility, which will be dedicated to sales, production, distribution and logistics,

aims to enhance the customer experience in the Western region. The new center offers more than 80,000 square feet of space designed to establish local production capabilities and allow for finished goods inventory. It will serve as a key U.S. sales and distribution center for customers in the states of California, Arizona, Nevada and New Mexico. Robert Colon manages the facility.

Guardian Glass and Velux Group Partner to Develop VIG

Guardian Glass and the Velux Group entered a joint development agreement concerning tempered vacuum insulating glass. This agreement will allow Guardian and Velux to develop manufacturing processes and capabilities together to meet the growing, evolving demand for VIG. With more than 170 years combined innovation and experience, Guardian and Velux will leverage their collective technical teams, intellectual property and additional tools to advance tempered VIG technology.

ProVia Partners with FlexScreen

ProVia announced its partnership with FlexScreen as a licensee. Under this partnership, ProVia will integrate the manufacturing of FlexScreen products at its window manufacturing facility, a decision that aims to further enhance its ability to deliver quality and promptly meet customer demand.

Crystal Window & Door Systems and Wincan Windows Create Alliance

Crystal Window & Door Systems entered an alliance with the manufactur-

ing division of the Toronto area Wincan Windows & Doors. The new affiliate entity, Crystal Canada Windows, has a new logo stylized after the current Crystal Windows logo but with a Canadian flag instead of a U.S. flag.

Crystal Canada will remain wholly owned by Wincan and the two firms will operate with separate management teams. However, Crystal Canada and Crystal Windows will increasingly work in collaboration on market plans, product design and development, production operations, logistics, and purchasing, as well as longer-term growth and expansion strategies. Crystal Canada's products will continue to be fabricated exclusively in Canada.

Marvin Selects Kansas City for New Manufacturing Facility

Marvin selected Kansas City, Kansas, as the future home of its latest manufacturing facility. Marvin started earthwork for the 400,000-square-foot facility in the Scannell 435 Logistics Center at 9822 Leavenworth Road in Wyandotte County. Upon completion in 2025, Marvin anticipates employing approximately 100 team members in full-time positions across manufacturing, fabrication and assembly of the company's fiberglass window and door solutions. Marvin expects to employ a 600-person workforce in Kansas City by 2028.

Quanex Closing Mikron Brand Plant in Kentucky

According to a WARN Act notice, Quanex Building Products Corp. is closing its Mikron brand plant. Mikron is a manufacturer of vinyl and composite window and door components and



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portfolio brands. The plant is located at 100 Mikron Way, Richmond, Kentucky. This closure is expected to happen on or around Aug. 6, 2024, and almost all positions will be impacted. The plant closure will be conducted in a phased approach. Employment separations will commence on or after June 7, 2024.

Jeld-Wen Closing Two Manufacturing Facilities

Jeld-Wen Holding Inc. will close its Vista, California, and Hawkins, Wisconsin, manufacturing facilities. In connection with these site closures, the company expects to incur one-time costs of approximately \$45 million and generate annual pre-tax income improvements of at least \$11 million.

WinDoor and PGT Products Featured on HGTV

Products from WinDoor and PGT Custom Windows and Doors, part of the PGT Innovations family of brands, were displayed in all four homes during the season five premiere of the HGTV show "Rock the Block." The show was filmed on location in Treasure Island, Florida, and features HGTV renovation stars who compete against one another to renovate identical properties and maximize their value. Products featured included the WinDoor countertop bifold, WinDoor bifold door, PGT 770 sliding glass door and the PGT casement window.

NewSouth Window Solutions Unveils New Website

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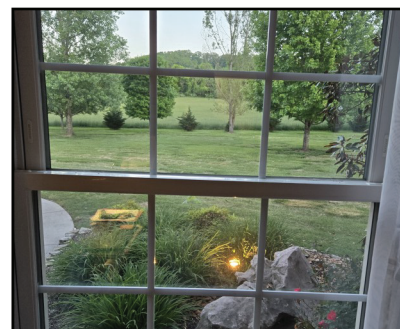
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unveiled the first phase of its new streamlined website, with features aimed at enhancing customer convenience, satisfaction and connection to the brand. New site features include location-specific pages to provide a better user experience. Phase two of the website revamp will roll out later this year, with additional updates and features focused on improving user experience and user interface.

People



Robinson

The National Glass Association

introduced *Holly Robinson* as its new senior media consultant, covering

the Western U.S. Alongside Chris Hodges and Tristan Scofield, Robinson will sell print and digital advertising for NGA’s two publications—Glass

Magazine and Window + Door—as well as sponsorship opportunities for NGA’s annual events in keeping with customer requests for all-encompassing marketing and promotional packages.



Turner

YKK AP America Inc.

appointed *Mike Turner* as president of the company’s commercial business group and *Josh Jensen* as president of the company’s residential business group. Turner is currently senior vice president of sales and marketing and has worked for YKK



Jensen

AP for more than 30 years. Jensen, who joined the company in January 2023, brings 25 years of experience in the windows and doors industry.

Robert Colon was also named regional manager for the Los Angeles Sales and



Colon

Manufacturing Center. He will be responsible for managing all aspects of daily operations and driving sales within the region, which includes California, Arizona, Nevada and New Mexico.



Zajichek

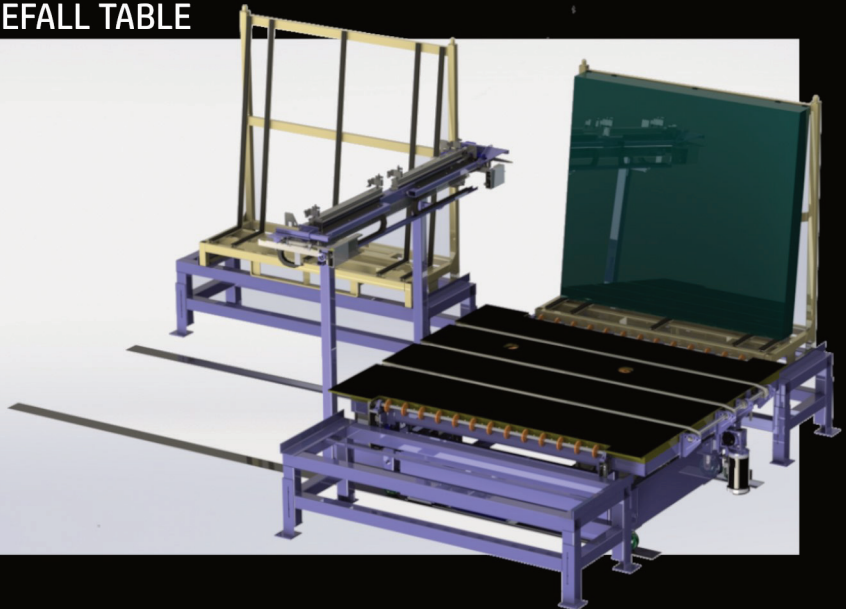
Austin Zajichek has been promoted to marketing manager for the **Linetec**, **TubeLite** and **Alumicor** brands. Zajichek and his team work

closely with product marketing manager, Brian Tobias, and their colleagues in commercial sales, human resources, product management and estimating. Zajichek has been a part of Linetec’s marketing team for 10 years. ■

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Living in Harmony

Exploring the pros, cons and technical challenges of bird-friendly glass in residences

BY ADAM MITCHELL



THE BOTTOM LINE: Tools, questions and answers to help equip you and the homeowner.

With ever-expanding urbanization, the impact of human development on various birds has become a significant concern. Bird-friendly glass, designed to minimize bird collisions with buildings, has emerged as a viable long-term and cost-effective solution. According to the American Bird Conservancy, an estimated one billion bird deaths per year are attributed to building design, making the issue immediate and pressing.

This article explores a different angle: bird-friendly glazing for residential

use. To date, bird-friendly mandates have focused on public, commercial and low-rise residential buildings. We aim to explore the requirements, benefits, drawbacks and technical ramifications of bird-friendly glazing in single-family homes and luxury residential spaces.

Deciding on bird-friendly glazing

The big question surrounding the use of bird-friendly glass for homes is whether the homeowner must

use bird-friendly glazing, or if it's a "nice-to-have" solution. Legislation throughout the U.S. and Canada is ever evolving, and focuses primarily on low-rise residential, commercial and public spaces. Though a step in the right direction to minimize bird strikes, no legislation yet exists for bird-friendly glazing in single-family homes.

This leaves the decision to use bird-friendly glazing squarely in the hands of the homeowner.

Interestingly, an estimated 36% of the one billion bird strikes occur at single-family dwellings. That's 360 million bird deaths due to homes alone. With such a high percentage of strikes occurring in this segment, it wouldn't be surprising to see bird-friendly mandates bridge into this area as well.

For the time being, it's important to remember that the bigger and more luxurious the window, the higher potential for bird strikes. If the home is designed with expansive glass, it may be a worthwhile endeavor to highlight the pros and cons of bird-friendly glazing to the homeowner, architect or general contractor.

Tying it all together

The vast number of considerations, products and aesthetic choices can be daunting for a window manufacturer. The following chart, with all the topics covered in this article, is a practical tool to help guide you and point the homeowner or architect in the best possible direction.

Type of BF Glass	Maximum Size	Low-e Integration Options	Weight	Price Point
Digital Printed Frit	130" x 300" (6mm)	a) Laminated Outboard b) Inboard Lite	a) 9.27 lbs/sq.ft. min b) 6.14 lbs/sq.ft. min	Medium
Laminated Patterns	98" x 300" (6mm)	Laminated Outboard	9.27 lbs/sq.ft. min	Medium
Acid Etch Patterns	96" x 130" (6mm)	a) Laminated Outboard b) Inboard Lite	a) 9.27 lbs/sq.ft. min b) 6.14 lbs/sq.ft. min	Low
Acid Etch + Low-e Integration	96" x 130" (6mm)	Standard DIGU	6.14 lbs/sq.ft. min	Low
UV Frit (invisible to human eyes)	102" x 144" (6mm)	Laminated Outboard (required)	9.27 lbs/sq.ft. min	High

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PROS of Bird-Friendly Glass

MIGRATORY BIRD SAFETY

The main benefit of bird-friendly glass is its ability to reduce bird collisions. Traditional windows are reflective and can easily confuse birds, leading to fatal collisions. Birds cannot differentiate between the reflection of a tree and the real thing. Thus, bird-friendly glass incorporates dots or patterns through digital ceramic frits, acid etching, UV banding or “dotted” laminates that “break” the reflection and provide birds with visual cues.

DURABILITY

The current lineup of bird-friendly glazing options is designed to last for the lifetime of the glass. Print, acid etching and UV technologies are proven long-term solutions and should be used in place of decals or other non-permanent products.

CONS of Bird-Friendly Glass

AESTHETIC CONCERNS

Incorporating bird-friendly elements into residential windows may be regarded as visually unappealing by homeowners and architects. The reality is that bird-friendly glass and glazing will require some visual markers unless costs reduce, and/or sizes increase, for UV-based solutions, which are invisible to humans. This is where a narrative becomes important—is the homeowner willing to contend with bird strikes?

COST CONSIDERATIONS

Bird-friendly glass may have a higher initial cost than traditional glass options; however, these costs vary widely depending on the type of bird-friendly glass the homeowner or architect selects. For example, UV glass costs considerably more than digitally printed bird frit, acid etch or laminated solutions.

Fig. 1 — Examples of pattern alignment.

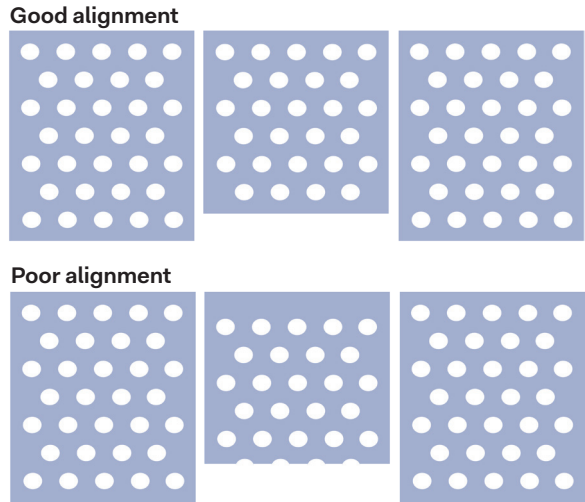


Fig. 2 — Examples of jumbo bird frit and low-e.

Printed Bird Dots	Laminated	Acid Etch	UV Bird Frit
Max Size: 130" x 300"	Max Size: 98" x 300"	Max Size: 96" x 130"	Max Size: 102" x 144"
CONFIGURATION 1 Enhanced Performance Bird Frit: Surface (1) Low-e: Surface (4) Min Thickness: 30mm +-1mm	CONFIGURATION 1 Enhanced Performance Bird Frit: Surface (2) Low-e: Surface (4) Min Thickness: 30mm +-1mm	CONFIGURATION 1 Enhanced Performance Bird Frit: Surface (1) Low-e: Surface (4) Min Thickness: 30mm +-1mm	CONFIGURATION 1 Enhanced Performance Bird Frit: Surface (1) Low-e: Surface (4) Min Thickness: 30mm +-1mm
CONFIGURATION 2 Standard Performance Bird Frit: Surface (1) Low-e: Surface (3) Min Thickness: 24 mm		CONFIGURATION 2 Standard Performance Bird Frit: Surface (1) Low-e: Surface (3) Min Thickness: 24 mm	

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➔ In the Trenches

Technical considerations

Size. Sizing considerations should be considered. For example, ceramic frit allows a window to be sized at 130 inches by 300 inches—up to the largest size in North America—but choosing a UV option will limit the overall window size to 102 inches by 144 inches.

Pattern alignment. If implementing a window-wall system or residential curtainwall, it's important to work with glass fabricators to align the glass appropriately. Care should be taken to justify the pattern and limit visual clutter from misalignment (Figure 1).

Low-e coating integration. The benefit of all bird-friendly glass is that it can be used with low-emissivity coatings. In many cases (especially in jumbo glass), the low-e coated glass must be a laminated outboard configuration or be used on the inboard lite of a double or triple insulating glass unit if lower thermal and solar heat gain coefficient performance is acceptable. Refer to Figure 2 for an example of possible configurations.

Many manufacturers and fabricators can implement first-surface bird frit and second-surface low-e coatings. Your mileage may vary depending on the sizes available. Some examples are included in the chart on page 14.

Bird-friendly glass is a fantastic solution for the homeowner looking to take an additional step toward bird safety. Though bird glazing comes with challenges and considerations, the outcome is proven: fewer bird strikes, a healthy environment and cleaner surroundings for the homeowner. Understanding the deterrent type, costs, sizes and technical considerations will help you better inform all home design stakeholders, while also providing questions you may wish to ask your glass fabrication partner. ■

Adam Mitchell is marketing manager at Agnora.

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Building a Top-Notch Maintenance Program

Solid preventative and proactive maintenance practices are an essential part of an optimized window and door manufacturing operation—how does your program stack up?

BY JOHN RYBA



THE BOTTOM LINE: Prevention should be the true goal of any maintenance department—not necessarily reactive repair.

Any manufacturer—whether they are in the window and door industry or not—knows that downtime is the enemy of efficient operations. When a critical piece of equipment stops working as intended, production is slowed if not ground to a halt completely. Diagnosing the problem and fixing it takes time, effort and resources, all of which could have instead been devoted to continued production.

Major manufacturers continue to focus on maintenance as a critical area of their business, one that is worth investment, rather than an unavoidable cost. And they're doing so with good reason. Research suggests that total annual losses associated with maintenance—across manufacturers as a whole—hovers around \$222 billion.

That is a massive figure, and one that window and door manufacturers can chip into with the right strategies.

Prevent and predict

Preventative maintenance (PM) tasks are the bedrock of a solid maintenance program. By some estimates, a well-rounded PM program can reduce overall maintenance and repair costs by as much as 18%.

Putting your PM program into prac-

tice, of course, can be trickier. Consistency is key when it comes to PM. Regular activities can be scheduled on a daily, weekly, monthly and annual basis as per the needs of your equipment and your production schedule. These might be as simple as greasing bearings on a machine or as complex as dismantling your glass washing station for a thorough evaluation and cleaning.

The rub is that if PM doesn't happen as scheduled, it doesn't work. During busier times of the year, it can be easy for some of your maintenance practices to fall by the wayside. But good PM requires making time—that might involve the maintenance teams and production teams communicating to collaborate on timing, schedules and other accommodations.

Embracing technology is a critical part of PM and predictive maintenance, too. Taking advantage of modern software systems is something many window and door manufacturers are doing, according to Window + Door's 2024 Industry Pulse. By merging the capabilities of software and machinery, operators can streamline maintenance tasks, improve their PM effectiveness, manage their existing equipment infrastructure, and predict problems before they happen via real-time data analysis.

If you're looking to enhance your PM programs or implement predictive maintenance techniques but aren't sure where to begin, it can be helpful to seek the assistance of a third party.

Some of your suppliers and partners may provide such services and can bring a helpful outside eye, helping you to identify what's working, what's not and how to bolster your overall maintenance program.

Identifying the root cause

Outside the purview of PM and predictive maintenance, unforeseen equipment breakdowns and other issues will inevitably happen on the manufacturing floor. Performing a fix quickly and effectively can help get your lines back into production with minimal interruption.

But it's just as important to understand why such a problem occurred—lest it happen again. Root cause analysis can help minimize the long-term impact of equipment issues and prevent them from becoming larger, more critical problems. The fast-paced nature of today's production floors sometimes may seem an impediment to proper evaluation and developing an engineered fix, but the upfront time spent is worth it to prevent ongoing issues that accumulate into more lost time.

Maintenance and production

I've mentioned a few times that maintenance work can be perceived as being at odds with optimal production. In reality, the opposite is true.

Production requires reliable equipment that works safely and consistently, enabling production of high-quality products for your customers. Maintenance, meanwhile, would have no job to do if the production team isn't making product. Neither would be successful without the other.

It can be helpful to keep this framing in mind when promoting a collaborative, symbiotic relationship between all teams on the shop floor. Plant managers should work to encourage this mindset—the benefits can be significant for your business and your bottom line. ■

John Ryba is technical services manager for Quanex.




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M&A: Bullish Outlook

Corporate and private equity buyers are expected to make bold moves in the 2024 market

BY ANDREW PETRYK



THE BOTTOM LINE: M&A activity in 2024 is expected to significantly exceed 2023 levels, with both corporate and private equity buyers showing renewed interest.

Last year was a quiet year for M&A in the window and door industry. Following a period of robust brand consolidation from 2018 to 2022, many leading window and door companies sat on the sidelines in 2023 as they weighed the potential impact of rising mortgage rates and high home prices on their performance. In lieu of completing new acquisitions, many industry participants spent the year focused on enhancing operating performance and integrating recent acquisitions.

BGL attended the 2024 International Builders' Show this February and met with many market participants to discuss company performance and to gauge their interest in M&A.

Common themes we heard include:

- 2023 proved to be a better-than-expected year in terms of industry performance. Despite interest rates surpassing 5%, new residential construction remained relatively stable (1.3 million to 1.5 million starts) throughout the year. Most companies saw their performance fall within a range of -5% to +5% versus the prior year on a revenue basis.
- Corporate development teams were clearly optimistic, indicating they had a renewed interest in M&A in 2024, particularly with the expectation of interest rate cuts this summer and as consumer demand for new housing remains strong.

2024's marquee start

Positive sentiment is supported by two marquee deals already announced in 2024, both at meaningful premiums:

1. Owens Corning acquires Masonite

In February, Owens Corning announced it was acquiring Masonite in a transaction valued at \$4.3 billion, representing a 38% premium to Masonite's stock price the day before the announcement. The transaction implies a purchase multiple of approximately 8.6x Masonite's consensus 2023 adjusted EBITDA. Masonite, a manufacturer of doors and door systems for the repair and remodel and new construction markets, operates 64 manufacturing and distribution facilities primarily in North America. Owens Corning called the proposed acquisition "transformative," and with the addition of doors to its product offering, it will establish a scalable new growth platform in a large addressable market while advancing its strategy to expand into adjacent building material categories.

"Masonite is a market leader that complements our existing residential interior and exterior product offering and has consistently demonstrated top-line growth and margin expansion," says Owens Corning CEO Brian Chambers. "The combination of our commercial, opera-



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tional and innovation capabilities allow us to accelerate our long-term enterprise growth strategy with a clear line of sight to meaningful synergies and increased cash flow generation.” The transaction is expected to close mid-year.

2. Miter acquires PGT Innovations

In January, window and door manufacturers Miter and PGT Innovations reached a definitive agreement to merge in a deal valued at \$3.2 billion in enterprise value, representing a 60% premium to PGTI’s stock price the day before the announcement (11.4x EBITDA). Miter and PGTI bring together a product mix and geographic presence that are “highly complementary” says Miter CEO Matt DeSoto, speaking to the transaction merits. Miter’s brands include MI Window and Doors, which supplies the Eastern U.S., and Milgard, which the company acquired in 2019

to expand into the Western U.S. PGTI brings a strong offering in impact-resistant windows and doors and a leading presence in the Southeast. The deal will be financed partly by an equity investment from Koch Equity Development, the investment and acquisition arm of Koch Industries, marking the third equity investment for the sponsor since 2019, says KED Managing Director Richard Hunt in the press release announcing the transaction. The transaction is expected to close mid-year.

Private equity firms make moves

In addition to corporate activity, private equity firms are looking to benefit from a first-mover advantage and invest in the highly fragmented window and door market while valuations are still at reasonable levels. Supporting this activity is a lender base that has begun to warm up to the building products industry

after spending much of 2023 reluctant to invest at meaningful levels.

In March, Cornerstone Building Brands announced it was acquiring Harvey Building Products, a maker of windows and doors under the Harvey, SoftLite and Thermo-Tech brands. In addition to a strong manufacturing and distribution footprint in the Northeast and Midwest, Harvey brings a “... strong reputation as a premium R&R manufacturer,” says Cornerstone CEO Rose Lee, speaking to the transaction merits.

Harvey was previously backed by Dunes Point Capital, which acquired the company in 2015. Harvey follows the December announcement of Eastern Architectural Systems, a manufacturer of impact-resistant window and doors serving the Florida R&R market. The acquisition of Eastern Architectural “... advances our strategy to increase exposure to high-growth regions with value-add products,” says Lee. Cornerstone is a portfolio company of Clayton, Dubilier & Rice, which it acquired in 2022 in a take-private transaction.

Looking ahead

In summary, we expect M&A activity in 2024 to significantly exceed levels of 2023, with both corporate and private equity buyers showing renewed interest. In particular, the acquisition of large assets such as Masonite and PGTI suggests a bullish long-term outlook and will catalyze broader M&A. Further, increased lender appetite and the prospect of interest rate cuts will serve to boost acquisition financing and provide much-needed liquidity to the market. ■

Andrew K. Petryk is a managing director and leads the industrials practice at Brown Gibbons Lang & Company, an independent investment bank serving the middle market. He can be reached at 216/920-6613 or apetryk@bglco.com.



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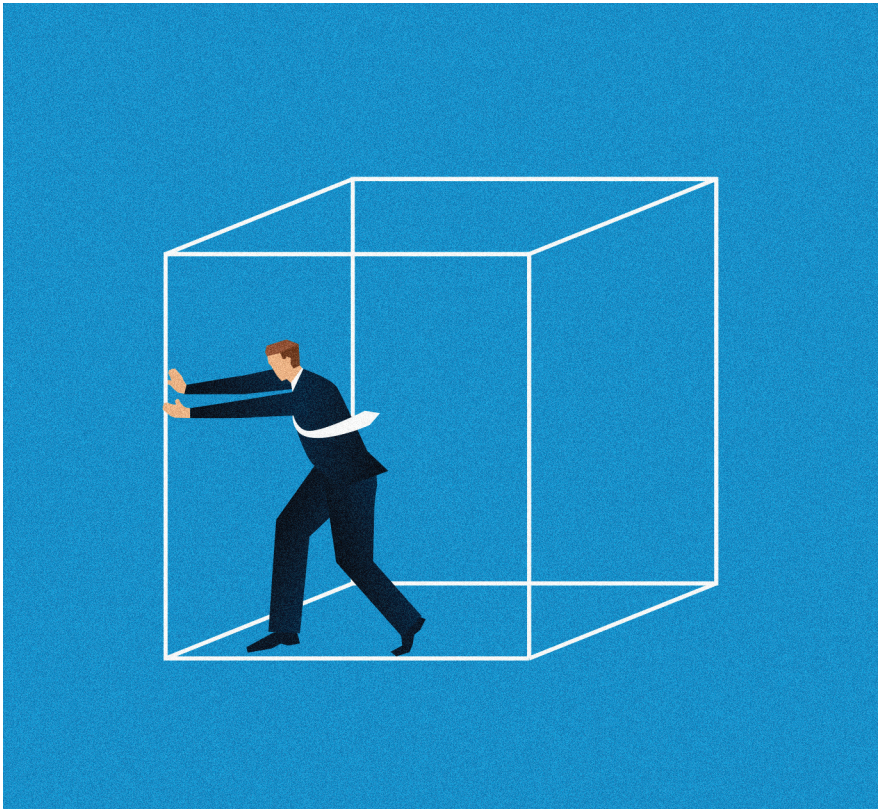


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Employees vs. Independent Contractors

The Final Rule sets forth six clarifications for differentiating between employees and independent contractors

BY MATT JOHNSON



THE BOTTOM LINE: Staying abreast of guidance related to proper worker designation can help employers avoid penalties, fines and litigation.

The “Final Rule” of the United States Department of Labor for distinguishing independent contractors from employees under the Fair Labor Standards Act took effect on March 11. But when is a final rule not final or the only version of the rule? Welcome to the world of defining independent contractors versus employees.

FLSA background

The FLSA was established to determine the minimum wage and overtime employers must pay to non-exempt covered employees. Independent contractors are not employees, and thus are not afforded the protections of the FLSA. Whether a person falls into the bucket of either “employee” or “independent contractor” has been an open question since the FLSA was passed, since the act provides no express rules or tests.

Over the years, courts have been asked to make these distinctions. The

primary guidance came from a 1947 U.S. Supreme Court opinion that set six factors. These were used by courts and the DOL for over 70 years to distinguish between employees and independent contractors. But as one might expect, treatments varied and there was no certainty for employers trying to make these decisions for themselves.

In January 2021, the DOL tried to help provide clarity. A rule was issued that said employers could rely on the general factors from the Supreme Court, but two (control and profit/loss opportunity) were identified as “core” considerations that were entitled to more weight than the others.

Things took a turn in May 2021. Under new management, the DOL delayed implementing the guidance of the January 2021 rule and then tried to withdraw it. This change was reportedly due to a position that suggested the mechanical weighting of factors was against the Supreme Court’s guidance. Court challenges followed, and eventually, the January 2021 rule was returned to enforcement.

The Final Rule

Come March 2024, the DOL has new guidance: the Final Rule. This new rule does two important things. First, it specifically rescinds the January 2021 rule. This is impactful because the DOL believes if the Final Rule is later challenged and not enforced, the January 2021 rule cannot replace it automatically.

Second, the Final Rule removes the weighting of factors and requires that the decision be based on a “totality of the circumstances” approach directed toward the economic realities of the worker and potential employer. With no factor or group of factors having more weight than another, the Final Rule notes that “economic dependence is the ultimate inquiry for determining whether a worker is an independent contractor or an employee.”

Legal challenges to both of the Final Rule’s actions are coming. For now, the



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This uncertainty matters to all employers because the penalties, fines and litigation that accompany a failure to properly designate workers can be crippling.

Final Rule reflects the DOL guidance. So, what do these factors mean for employers trying to clarify their workers under the FLSA?

1. Opportunity for profit or loss: This issue generally focuses on whether the worker can meaningfully refuse the work. Where a worker can negotiate the pay or rate, meaningfully accept or decline a request for work, and have their own marketing and business expansion efforts, there is a higher likelihood that the role is filled by an independent contractor. In those circumstances where the worker has no chance to realize independent loss or gain from the job, employee status is a closer call.

2. Investment by the worker and employer: This factor speaks less to the value of money and more to the scope to which money expenditures go. For example, where a worker has similar embedded business-related expenses as the potential employer (payroll, marketing, overhead), there is a higher suggestion that the worker is an independent contractor. The

expense amounts need not be equal. Rather, the comparison of the expense-use can suggest true independence.

3. Performance and volume of the work relationship: Can workers set their own hours and when their work is performed? Non-exclusive, project-specific work has a higher indication that a worker is an independent contractor. This has less to do with normal seasons of work, like construction during the summer, and turns more on whether the worker can choose to work at all.

4. Control over the work: Where an employer sets the schedule and supervises performance, these controls point toward an employee designation. Beyond physical controls, where an employer limits the opportunity to work for others during a job, employee status is also more likely. That is not to say that oversight of a job to ensure compliance with the work is not permitted, but the more direct control over the means and methods used by the worker, the closer the question becomes.

5. Integral nature of the work to the employer's business: This is a holistic consideration that looks to the business of the employer and weighs whether the worker is performing work that is necessary to the principal business model. If the employer's business cannot occur without the worker, then the facts tend toward an employee relationship.

6. Skill and initiative of the worker: What critical skills is the worker bringing to the relationship? Are these skills essential to the work and do they depend on training offered by the employer? The issue here is not to weigh whether skills overlap, but whether the worker has independently generated skills that they are using in the performance of the work.

Lingering uncertainty

Clarity on when and what matters in deciding whether a worker is an employee or independent contractor can remain elusive even with the guidance above. The economic factors seem to carry most of the weight. Unfortunately for employers, the decision is also complicated by the fact that these factors are specific to the FLSA. These six criteria do not control worker determinations made by the Internal Revenue Service, Employee Retirement Income Security Act or individual state employment rules—California has a notable independent test.

This uncertainty matters to all employers because the penalties, fines and litigation that accompany a failure to properly designate workers can be crippling. For now, staying abreast of these developments is the only way to know how the rules are applied. ■

Matt Johnson is a member of The Gary Law Group, a Portland, Oregon-based firm specializing in legal and risk issues facing manufacturers of glazing products. He can be reached at matt@prgarylaw.com.

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Future-forward Hardware Solutions

How a holistic approach of integrating quality, technology, security and sustainability can help shape the evolving window and door hardware manufacturing industry

BY TARA LUKASIK

Roto Frank is becoming synonymous for innovative, tailored and reliable hardware systems that create added value for windows and doors. In addition to focusing on digitalization within its own company, Roto is actively helping its customers increase their efficiency using digital processes and automation.

Dan Gray, director of sales for Roto North America, took the time to sit down with Window + Door to discuss Roto's involvement in the North American market. He highlights how Roto is positioning itself as a leader in

the hardware manufacturing industry while steadily embracing technological advancements and market trend shifts, focusing on Roto's approach to automation technology integration and safety and security-oriented solutions, and its focus on improving energy efficiency and using sustainable manufacturing practices.

Window + Door: How has Roto evolved over the years, and what sets it apart from other window and door hardware manufacturers?

Dan Gray: We have two manufacturing plants in North America, one in Canada and one in the United States. Local manufacturing offers Roto the ability to build quality into our hardware and better control our delivery service to our customers.

Over the past 20 years, Roto North America has continued to increase the depth of its window and door hardware portfolio. Our core focus and competency in North America is casement/awning and sliding patio door hardware solutions, and we have steadily added line extensions

Over the past 20 years, Roto North America has continued to increase the depth of its window and door hardware portfolio.



to the portfolio over the years. And in December 2022, Roto acquired Ultrafab, the leading manufacturer of weather-sealing solutions.

WD: How does Roto ensure the quality and performance of its hardware products?

DG: Having the ability to manufacture hardware locally, we can design and manufacture quality hardware from the point of specification to the point of shipment. We purchase only the highest grade of raw materials that help ensure a quality finished product.

WD: Smart technology integration is becoming increasingly important in residential hardware. How is your company incorporating smart locks, sensors and other tech-enabled features into your window and door hardware products?

DG: Roto is the exclusive distributor to original equipment manufacturer for Autoslide automation technology for sliding and hinged patio doors. This technology can aid the growing trend for accessibility from indoors to outdoors in one's home.

WD: In the trend toward safety and security-oriented fenestration solutions, what advanced security features does your hardware provide to enhance the safety of residential windows and doors?

DG: Roto has been a leader in providing window opening control devices,

or WOCs, for hung and sliding windows since 2010. A WOC that is properly installed will limit the opening angle of a window to help prevent small children from falling. Our WOCs are manufactured from quality zinc materials and are 100% compliant with ASTM-F2090-21.

WD: With the increasing focus on energy efficiency from homeowners, how does your company's hardware contribute to improving the energy efficiency of windows and doors?

DG: Roto's hardware is tightly sealing to help ensure the efficient energy performance of the windows and doors. For example, Roto's casement lock bars have adjustable lock pins that allow for a change in compression when needed to help prevent water and air infiltration.

WD: In the context of sustainability, what initiatives has Roto undertaken to reduce its environmental impact?

DG: In addition to optimizing machinery, using energy-efficient lighting and monitoring energy usage to identify and reduce energy consumption in our manufacturing processes, Roto North America regrinds injection-molding plastics and reworks scrap zinc to minimize waste and impact on the environment. Our commitment to sustainable practices aligns with the growing awareness of responsible resource management, and we also explore eco-friendly materials for our products.

WD: How do you see the window and door hardware manufacturing industry evolving, and what role does Roto play in shaping those changes? What future trends or developments can we expect from Roto?

DG: The fenestration industry has three prominent trends that impact a hardware supplier: an increase in size (height, width and weight), colors (black is prominent), and automation (opening and closing). One example of how Roto is helping to shape the trend for an increase in the size of casement windows is to offer three levels of hinges that do not require additional processing by the fabricator: standard (125-pound sash), heavy-duty (150-pound sash) and supreme (200-pound sash).

WD: What challenges does Roto face in the current market, and how does the company address or overcome these challenges? Are there specific industry challenges that you believe deserve more attention or discussion?

DG: The economy has not been friendly to our industry in the past 18 months (high interest rates and a lack of new residential construction), so Roto is focused on adding value for our current customers and enticing prospective customers with the introduction of new products, a reduction in manufacturing throughput times and a strong commitment to quality products. ■



THE 2024 TOP MANUFACTURER



MANUFACTURERS REPORT

Photo courtesy of Joyce Manufacturing

COMPANIES TAKE A HOLISTIC APPROACH TO THEIR BUSINESS AS THEY INVEST IN PROCESSES, PEOPLE AND PRODUCTS WHILE KEEPING AN EYE ON A MARKET CHALLENGED BY INFLATION AND AFFORDABILITY CONCERNS

BY LAURIE COWIN

A 36 VIEW

INFLATION, AFFORDABILITY AND RISING COSTS in materials and labor appear to be the biggest challenges for companies as they navigate the current economic climate, according to Window + Door's 2024 Top Manufacturers Report. Market and production expansion, as well as energy efficiency, are driving companies' growth, and many report those sectors to be among their biggest business opportunities this year. Once again, the market shows that despite some big challenges, residential fenestration manufacturers continue to focus on, and take advantage of, opportunities.

This year's Top Manufacturers Report examines the construction, building and manufacturing industries at large before diving into insights from the statistics provided by residential fenestration manufacturers, compiled using data from a survey companies completed in March of this year.



THE

BUILDERS

The fenestration supply chain is a robust one and necessitates keeping abreast of the latest macroeconomic trends, plus trends within our industry, including single-family new construction, repair and renovation, and manufacturing itself.

New construction

The latter half of 2023 saw decreased builder confidence and housing starts, according to data from the Nation-

al Association of Home Builders, the U.S. Department of Housing and Urban Development, and the U.S. Census Bureau.

This year had a strong start, but the ups and downs continue. February new home sales were up 5.9% year over year, according to data from HUD and the Census Bureau. Overall housing starts increased 10.7% in February; single-family marked

a 11.6% increase and are up 35.2% compared to a year ago. The multifamily sector increased 8.3%.

March, however, saw declining numbers again. Overall housing starts decreased 14.7% in March and single-family homes under construction decreased 2.7% compared to a year ago. “Single-family starts were down in March as interest rates increased and multifamily production fell

as builders faced tighter financing conditions,” says Danushka Nanayakkara-Skillington, assistant vice president for forecasting and analysis, National Association of Home Builders. “And with single-family permits also down in March, single-family production will likely decline again in April.”

The median price of new homes in 2023 was down 6% compared to 2022, which the NAHB attributes to



PICTURE

builders cutting home prices and building slightly smaller homes. In fact, analysis shows new homes built in 2023 are at their smallest size in 13 years; more than a quarter plan to construct even smaller this year.

Remodeling

The remodeling market is a mixed bag. NAHB forecasts stable remodeling spending in 2024, which the Remodeling Market Index score of

66 reflects. (Any score above 50 is in positive territory.) “Demand for remodeling remains solid, especially among customers who don’t need to finance their projects at current interest rates,” says NAHB Remodelers Chair Mike Pressgrove. “Construction costs are still an issue in some places, just as they were toward the end of last year.”

Meanwhile, the Leading Indicator of Remodeling

Activity from the Joint Center for Housing Studies of Harvard University anticipates annual expenditures for improvements and repairs to owner-occupied homes will decrease this year and into the first quarter of 2025. JCHS, however, projects the decreases will be at a moderating rate with homeowner spending declining by over 7% in the third quarter of this year before easing to just -2.6% through the first quarter of 2025.

“Residential remodeling is expected to benefit from the rebounding housing market and stabilizing material costs as we move into next year,” says Carlos Martín, director of the Remodeling Futures Program at JCHS. “While home improvement and repair spending is down from pandemic-induced highs, the nation’s aging homes continue to need investment in critical replacements, home performance deficiencies, as well as modernization.”

Manufacturing

Nearly 40% of manufacturers pulled back on hiring and investing due to increased taxes, according to the National Association of Manufacturers Q1 2024 Manufacturers’ Outlook Survey. About 94% of respondents indicated the importance of the federal tax code reducing manufacturers’ costs for conducting R&D, accessing capital via business loans, and investing in capital equipment purchases. The survey indicated 68.7% of respondents felt somewhat or very positive about their company’s outlook, marking the sixth consecutive reading below the historical average of 74.8%.

Also of note from the survey was nearly two-thirds reporting an inability to attract and retain employees. Other notable headwinds include an unfavorable business climate, rising health care and insurance costs, a weaker domestic economy and weaker sales for manufactured products.



THE RESIDENTIAL FENESTRATION

MARKET

THE WINDOW AND DOOR MARKET INDEX

John Burns Research and Consulting and Window + Door partnered to create the Window and Door Market Survey, which captures timely market developments and insights from residential fenestration manufacturers. Respondents for the Q4 2023 survey represent an estimated 40% of residential industry volume.

Companies increased average revenues by +3.8% year over year, a deceleration from the +7.2% year over year reported in Q3 2023, but still growth compared to the continued realization of price increases implemented in late 2022.

Key takeaways from the most recent Window and Door Market Survey include:

1. Companies are gearing up for growth in 2024. Commentary suggests a need to pivot from taking orders, which was a focus over the past three years, to creating demand. Companies expect to reignite brand loyalty with homeowners, contractors and dealers. JBREC expects demand to materially improve throughout 2024.

2. Companies see reduced backlogs from improved supply chain performance. All companies say most of their active projects are on schedule and 44% of companies report projects take less time to complete than the year prior. Respondents did note, however, delays in imports from Asia due to disruptions in the Middle East affecting cargo shipments.

3. Companies report persistent material and labor inflation. Input costs for material

43.5

100

This indicates that window and door companies' industry sentiment is normal. All three subcomponents of the index showed contraction. (Subcomponents include next quarter expected revenue, volume changes for window and door shipments/installations, and demand for window and door products and services.)

and labor continue to rise and they also cite the need to increase staff pay as the U.S. labor market remains tight.

4. Most companies plan to raise prices in 2024. Window and door companies believe they have significant pricing power with end customers, as evidenced by 61% planning to raise prices by 4.5% on average in 2024. In 2023, however, prices remained relatively flat following accelerated price increases in 2022. Companies say these increases are necessary to maintain margins as they feel the effects of material and labor inflation and higher import shipping costs.

SALES, GROWTH

Most companies (slightly over 50%) reported higher gross sales in 2023 compared to 2022. About three-quarters added production capacity last year, too.

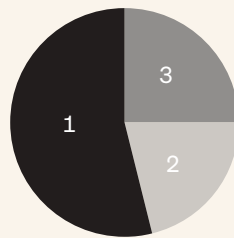
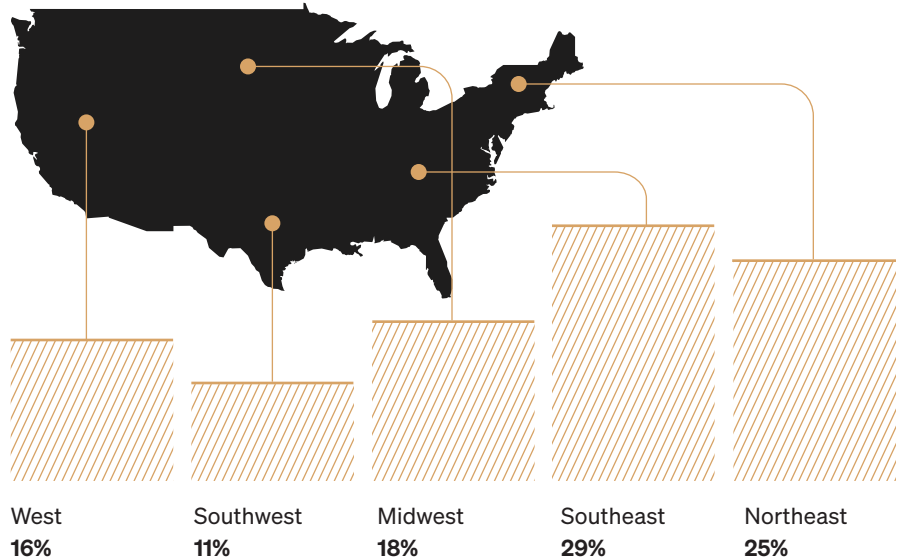
Data from JBREC indicates similar demand conditions for residential products in single-family new construction, single-family repair and remodel, and multifamily. Demand for multifamily products is slightly higher than in the past three years, but demand likely will decline as many multifamily units near completion in early 2024. JBREC expects single-family new construction and repair and remodel to improve later this year due to expected interest rate declines.

The sales landscape continues to evolve. One company, whose 2023 sales were about double as their 2021 sales, shared, “While overall demand has slowed down, the demand for our high-performing products has been growing. We are optimistic the overall market will make a rebound in the next few months with interest rates stabilizing. We anticipate double-digit increase in 2025.”

Other respondents echoed similar sentiments about an overall demand reduction, but those that are investing in the space are after high-performance products. Most high-end luxury products appear to be insulated from economic hardship. Others view a possible slow-down as yet another opportunity. “We have measures in place to adjust our production and staff as necessary to maintain profit margins,” writes one respondent. “We see this downtime as an opportunity to focus on more innovation.”

Several note the importance of looking at statistics, including how permits turn into starts and how the real estate market is performing.

In which geographic markets did you see the most growth in 2023?



How did your 2023 gross sales compare to 2022 gross sales?

- 1. Higher **54%**
- 2. Lower **21%**
- 3. About the same **25%**

71%

of companies note they experienced measurable, significant growth in the past five years. Companies attribute growth to things like demand in new and remodel projects, increased market share, expanding into new areas, acquisitions, increasing production, and introducing new products. Several also note significantly expanding their workforces.

94%

of companies added production capacity in 2023. Capacity increases revolved around adding extra shifts, expanding facilities, adding machinery, streamlining processes, and growing production and office staff.

56% of window and door companies reported YOY volumes declining in Q4 2023. Average volumes across all companies were flat YOY. Conversely, **50%** reported YOY revenue growth in Q4 2023 and +3.8% YOY.



CHALLENGES, OPPORTUNITIES

Respondents to this year’s survey provided ample insight as to headwinds. “The window production industry is expected to face a number of major headwinds in 2024, including rising costs of raw materials, shifting consumer preferences, global supply chain disruptions, and increased competition,” writes one respondent. “Companies will need to be proactive in addressing these challenges and finding ways to adapt to the changing market landscape in order to remain competitive and successful in the years to come.”

One respondent references the rapid advancement of technology and consumer preferences. “Staying ahead demands constant innovation and adapting our designs to meet new market trends, requiring significant investment in R&D and a flexible approach to development.”

“I think we’re past the material inflation challenges, and have been for several years,” writes another respondent. “Those that still have challenges won’t be able to recoup those costs. Now, we see deflation in our product categories. Interest rates and availability of excess cash or loans to start projects are challenges. I think we’ll see deferred decisions to buy a home and deferred maintenance on higher-cost items like millwork.”

Much of the data and commentary collected this year echoes the challenges of home affordability, both for buying a new or used home and for embarking on higher-dollar projects such as window and door replacements.

Companies continue to focus on big business opportunities and taking a holistic view. “A 360-degree focus on employees, supply chain and customers creates partnerships that make it possible to pivot to take advantage of new opportunities,” writes one respondent.

Where will you invest in your business in 2024?

Equipment updates	17%
Marketing	17%
Software updates	16%
New product introductions	15%
R&D/testing	12%
Employee recruiting and retention	12%
Location expansions	11%

What will be major headwinds in 2024?

Inflation	18%
Labor shortage	12%
Housing affordability	12%
Material cost	12%
Policy	10%
Material availability	7%
Evolving product designs	7%
Supply chain	6%
Energy prices	5%
Backlogs	3%
Tariffs	2%

35%

of window and door companies do not expect an impact from the Inflation Reduction Act tax credits for homeowners; 24% think it will provide a tailwind for their business, with 6% indicating it will be “very impactful.”

Source: JBREC

Other notable opportunities include energy efficiency, acquisitions, growing existing customers, increased capacity, and expanding facilities and product lines.

PRODUCTS

Vinyl windows and patio doors remain the overwhelming market leaders, according to the report. The top-requested features remain unchanged from last year’s report, with energy-efficient products, larger windows and doors, and color as the most requested.

Energy Star Version 7.0’s implementation last October has upped the ante on what products qualify as Energy Star rated, especially at the top level. Nearly all companies are updating, plan to update or have products that already meet the new requirements. Triple pane and fourth-surface low-E are the top technologies companies use to up the efficiency, but plenty of other technologies are in action, as shown in the chart to the right.

“One of the biggest business opportunities in window production lies in the development and manufacturing of energy-efficient windows,” writes one survey respondent. “By investing in the research and development of innovative window technologies, companies can create a competitive advantage in the market and attract environmentally conscious customers.”

“Another significant opportunity in window production is the customization of windows to meet specific customer needs and preferences,” they continue. “Furthermore, the rise of smart home technology presents a promising opportunity for businesses in the window production industry. By partnering with technology companies and investing in the development of smart window solutions, manufacturers can tap into a growing market segment and align their products with the latest technological trends.”

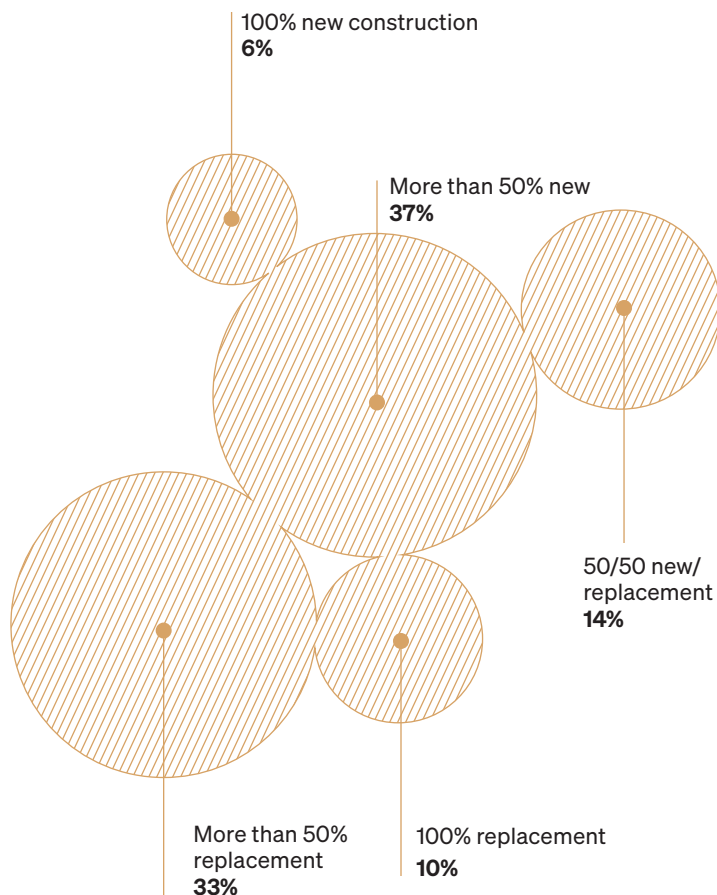
Energy Star is still the dominant certification, but some pursue other certifications, too, including Passive House, Living Building Challenge and impact ratings.

Please select the top features in products that your customers request.

Larger windows/doors	21%
Color	20%
Energy-efficient products	17%
Customized products	17%
Impact-rated products	11%
Sound abatement	6%
Historically accurate products	4%
Other	4%
Smart and tech-enabled products	1%

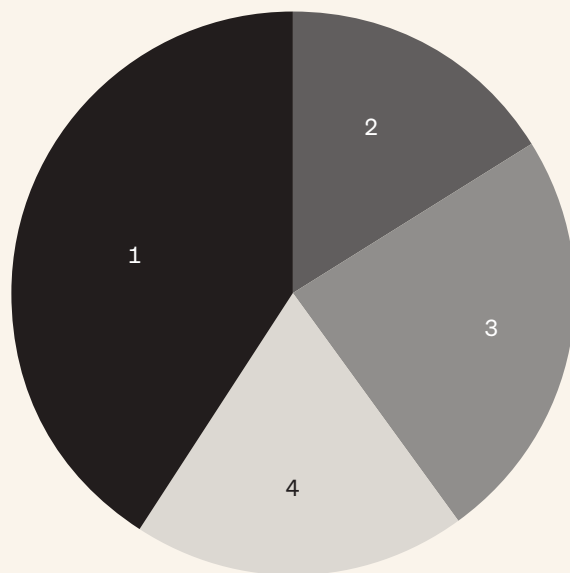
Respondents could select more than one answer

What percentage of products are new construction versus replacement?



Did you update, or are you in the process of updating, Energy Star certification?

1. Yes, I have updated some products **41%**
2. Yes, I am planning to update some products **19%**
3. No, I did not update; my products already meet the standards **24%**
4. No, I did not update; I am letting my certification lapse **16%**



What technologies have you implemented/are you considering to enhance energy efficiency?

Triple pane	22%
Fourth-surface low-E	16%
Foam fill	4%
Glass coatings	12%
Gas fill	11%
Skinny triples	8%
Thermally broken aluminum	7%
Larger IG pockets	6%
Dynamic glass	3%
Aerogel	2%



What is your biggest labor challenge?

Recruitment	34%
Retaining	23%
Training	23%
Wage expansion	21%

What are your most effective employee recruitment strategies?

Referrals	32%
Social media	22%
Agencies	17%
Job fairs	10%
Open interviews	10%
Other*	4%
Signing bonuses	2%
Location signage	2%
Partnerships with local schools	1%

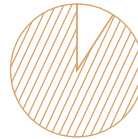
*Other includes word of mouth, digital advertising and wage transparency in job descriptions.

What are your most effective employee recruitment strategies?

Competitive salaries	22%
Company culture	21%
Opportunity for advancement	17%
On-the-job training	17%
Increased benefits	15%
Flexible work shifts	6%
Education incentives	2%



21% of companies had more difficulty finding workers in 2023 compared to 2022. This figure is a marked improvement from last year's report, in which 50% of companies cited more difficulty in finding workers.



91% of companies plan to hire new workers this year.



Direct labor costs increased 7% YOY.

Source: JBREC

IN THEIR WORDS

Diversity: Biggest Training Challenge, Greatest Asset

"Our biggest challenge in training new employees is also one of our greatest assets: the diversity of our workforce. Our team comprises individuals from a multitude of countries, creating a rich tapestry of cultural and linguistic backgrounds. This, however, brings forth certain hurdles, particularly in the realms of language, communication and metric-to-imperial conversion.

In addressing these challenges, we have implemented an extended onboarding program that provides ample time for training on fundamental tasks, such as reading a tape measure, and understanding their practical application in daily duties. While we are yet to overcome the language barrier entirely, we have made significant strides in this direction. Our training instructors are proficient in English, Spanish, French and Creole, ensuring effective dissemination of critical start-up information to most of our staff.

These instructors maintain a supportive and continuous relationship with the new hires and their leaders during the initial 30 days of employment. It's essential to remember that for some, this job may signify their first venture into manufacturing, their first job in general or their first work experience in this country. We view these circumstances not as hurdles, but as opportunities for growth, adaptation and fostering an inclusive work environment. We believe that our diverse workforce is our strength, providing us with unique perspectives and approaches that drive our success in the manufacturing industry."

LABOR

Recruitment is the top challenge around labor, followed by retention, training and wage expansion, all of which respondents cited as being equally difficult.

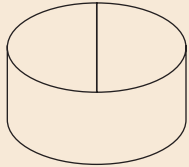
Qualified installers, manufacturing floor labor and more are feeling the impact of the labor shortage. Several companies note the fierce competition to retract and retain labor in their markets. Other commentary from this year's survey noted the challenge of keeping new employees engaged and motivated.

"Language barriers and cognitive load can be challenging for team members learning a new role," writes

a respondent. "We've implemented several [English as a second language] initiatives to bridge the gap in communication and we've also implemented voice-to-pick technology to help production team members more easily navigate process for custom products."

Transferring knowledge from retiring employees with decades of experience to employees in training is also a challenge. Those same workers were often the trainers and it's imperative that companies formalize and document their knowledge so that it can be passed on to new workers.

SUPPLY CHAIN AND MATERIALS



50% of companies are experiencing increased demand compared to last year. The 28% that are not seeing increased demand cite an “expected decline after the COVID boom,” a slowing economy and market uncertainty. The remaining 22% are unsure.

67%

of companies experienced material price increases last year. Price increases averaged 9.6%. Although the majority of companies are experiencing price increases, this figure is significantly lower than last year’s recording of 99% indicating price increases, with many companies noting increases of up to 30%.



63% of window and door companies report reduced backlogs in Q4 2023 versus Q4 2022. 25% report increasing backlogs.

4%

Material input costs increased 4% YOY.

Source: JBREC

“WITH RISING MATERIAL COSTS, RISING LABOR COSTS AND INFLATION, WE HAVE NO CHOICE BUT TO INCREASE OUR PRICES IF WE WISH TO RETAIN THE SAME LEVEL OF QUALITY, PERFORMANCE AND CUSTOMER SERVICE.”

What materials are most challenging to source?

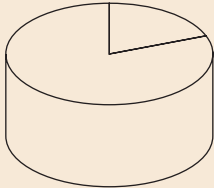
Glass	33%
Hardware and components	17%
Aluminum	11%
Vinyl	8%
Laminate	7%
Weatherstripping	7%
Wood	5%
Paint	4%
Glass spacers	3%
Other*	3%
Sealants	2%
Fiberglass resin	1%

Respondents could select multiple answers

*Adhesive resins, glass laminate, flat glass.



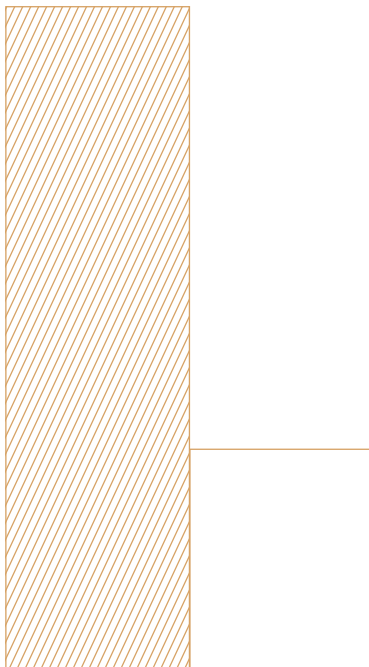
AUTOMATION AND TECHNOLOGY



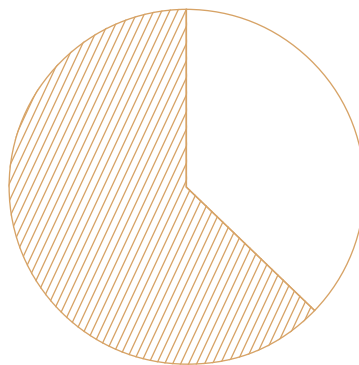
81% of respondents include automation in their factory. Automation's biggest benefits include increased quality, increased output, cost and labor savings, and safety benefits.

68%

plan to add automation in the next year. 24% are unsure. Anticipated equipment includes welding equipment, robotics for fabrication and assembly processes, IG fabrication, glazing tables, material handling, CNC, screen machines, cleaners and more.



75% of companies do IG production in-house.



63%

of companies have other in-house operations. Other in-house operations include extruding, profile laminating, laminating, pultruding, part and IG fabrication, painting/staining, tempering, roll forming, and powder coating.

40%

of companies use artificial intelligence in their business. Of those that are leveraging AI, one company is exploring use cases related to process and schedule optimization, vision systems with AI learning and large language model chatbots for training. Other AI uses include marketing campaigns, service tickets, cameras to detect employee performance and adherence to safety standards, and website chatbots.

WHY SHOULD YOU AUTOMATE?



ERDMAN® HIGH SPEED IG LINE

Automation is Not Just About Cycle Time and Output. Did You Know Automating IG, Glazing and Screen Production Does These Things?

- Reduces the revolving door of employees that often are your largest risk of quality, performance and safety. For example: work loss incidents and training time consumption.
 - Reduces some of the most dangerous work stations that can cause injury and trap skilled workers.
 - Creates opportunities for your trusted long-term employees to grow fostering loyalty and increased performance.
 - Reduces the need for that needle in the haystack employee that can lay the spacer perfectly, put down the perfect bead of silicone and make a screen square with no screen mesh sag.
 - Reduces or eliminates extra labor in downstream areas like final assembly and glazing bead assembly .
 - Make a better and cleaner looking window that just may make the difference in gaining or losing a customer.
- Visit www.erdmanautomation.com or call 763-389-9475 for more information.

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MORE THAN \$1 BILLION

Andersen Windows & Doors*

andersenwindows.com
 Bayport, MN
 800/426-4261
PRODUCTS MANUFACTURED:
 Wood, composite, vinyl-clad wood windows, aluminum and fiberglass windows, entry doors, and patio doors
SUBSIDIARIES/SISTER BRANDS:
 Andersen Windows and Doors, Renewal by Andersen, Heritage, MQ and Weiland brand names

Associated Materials

associatedmaterials.com
 Cuyahoga Falls, OH
 234/542-4328
PRODUCTS MANUFACTURED:
 Vinyl windows, vinyl patio doors

Cornerstone Building Brands*

cornerstonebuildingbrands.com
 Cary, NC
 888/624-8677
PRODUCTS MANUFACTURED:
 Acoustic windows; aluminum patio doors, sliding doors and windows; aluminum-clad doors and windows; composite windows; impact-resistant aluminum doors and windows; impact-resistant doors; impact-resistant vinyl patio doors and windows; impact-resistant windows; insulating glass units; multi-panel doors; multi-slide pocketing doors; patio doors; sliding doors; vinyl casement patio doors and windows; vinyl doors, entry doors,

multi-panel patio doors, patio doors, replacement doors and windows, sliding doors and windows; and wood patio doors and windows
SUBSIDIARIES/SISTER BRANDS:
 Ply Gem Windows & Doors, Silver Line Windows & Doors, Simonton Windows & Doors, Atrium Windows & Doors, American Craftsman Windows & Doors, Great Lakes Window and Ply Gem Canada, Cascade Windows, Eastern Architectural Systems

Jeld-Wen

jeld-wen.com
 Charlotte, NC
 704/378-5700
PRODUCTS MANUFACTURED:
 Vinyl windows, composite windows, clad windows, wood windows, vinyl patio doors, aluminum patio doors, multi-panel vinyl doors, multi-slide pocketing aluminum clad doors, fiberglass entry doors, steel doors, wood doors, interior doors
SUBSIDIARIES/SISTER BRANDS:
 LaCantina, VPI, MMI, ABS, Dana, Swedoor

Marvin

marvin.com
 Warroad, MN
 888/537-7828
PRODUCTS MANUFACTURED:
 Aluminum and fiberglass doors, Wood and aluminum clad windows and doors, Wood windows and doors, Fiberglass windows, Fiberglass doors, Interior doors, Entry doors, Impact-resistant windows and doors, Impact-resistant garage doors, Skylights and smart skylights, Integrated smart windows and doors
SUBSIDIARIES/SISTER BRANDS:

Infinity from Marvin Replacement Windows & Doors, TruStile Doors and SIW Solutions

Masonite

masonite.com
 Tampa, FL
 817/739-1828
PRODUCTS MANUFACTURED:
 Interior doors, aluminum patio doors, multi-slide pocketing aluminum clad doors, fiberglass entry doors, steel doors, wood doors, interior doors, pivot and hinged glass entry doors, high performance components
SUBSIDIARIES/SISTER BRANDS:
 Endura Products, Fleetwood Windows and Doors

Miter Brands

miterbrands.com
 Harrisburg, PA
 717/365-3300
PRODUCTS MANUFACTURED:
 Vinyl windows, vinyl patio doors, aluminum patio doors, multi-panel vinyl doors, aluminum and fiberglass windows and fiberglass patio doors
SUBSIDIARIES/SISTER BRANDS: MI Windows and Doors, Milgard Windows and Doors

Pella

pella.com
 Pella, IA
 641/780.5162
PRODUCTS MANUFACTURED:
 Wood windows, vinyl windows, clad windows, vinyl patio doors, aluminum patio doors, multi panel vinyl doors, fiberglass entry doors, steel doors, wood doors, fiberglass windows and patio doors
SUBSIDIARIES/SISTER BRANDS:
 Custom Window Systems, Reilly Windows and Doors,



Photo courtesy of Lux Windows and Doors



Bonelli Windows and Doors, Duratherm Windows Corporation, Win-Dor, Avanti Windows, Burris, Lawson Industries, Inc.

PGT Innovations

pgtinnovations.com
North Venice, FL
760/983-0932

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors, aluminum patio doors, multi-panel vinyl doors, garage doors, patio enclosures, aluminum windows

SUBSIDIARIES/SISTER BRANDS:

WinDoor, CGI Windows & Doors, Martin Door, Anlin Windows & Doors, Western Window Systems, NewSouth Windows & Doors, Triple Diamond Glass, ECO Windows & Doors



Photo courtesy of ES

Velux*

veluxusa.com
Greenwood, SC
803/396-5700

PRODUCTS MANUFACTURED:

Residential skylights, tubular skylights, commercial dome skylights, structural framed skylights, barrel vault skylights, polycarbonate panels, modular commercial skylights, flashing systems, electronic controls and blinds

Wintegra Windows Inc.*

wintegra.ca
Abbotsford, BC, Canada
778/981-0309

PRODUCTS MANUFACTURED:

Tilt & Turn Windows, casement windows, lift & slide doors, exterior swing door, French patio door

\$500 MILLION TO \$1 BILLION

ES

eswindows.com
Miami, FL
754/900-2300

PRODUCTS MANUFACTURED:

Aluminum patio doors, vinyl windows, vinyl patio doors, aluminum pati doors, interior doors

SUBSIDIARIES/SISTER BRANDS:

ES Metals, GMP, Componenti

Kommerling USA*

kommerling.us
Huntsville, AL
800/330-2239

PRODUCTS MANUFACTURED:

Lift & slide patio doors, tilt-and-turn windows, balcony doors,

residential doors, large fixed lights

ProVia

provia.com
Sugarcreek, OH
800/669-4711

PRODUCTS MANUFACTURED:

Steel doors, vinyl windows, clad windows, vinyl patio doors, fiberglass entry doors, steel doors, aluminum storm doors

SUBSIDIARIES/SISTER BRANDS:

Premier Profile Lamination

Starline Windows*

starlinewindows.com
Surrey, BC, Canada
604/882-5100

PRODUCTS MANUFACTURED:

Aluminum window wall, unitized curtain wall, patio doors, sliding sealing doors,

patio doors and swing doors; vinyl windows, patio doors, sliding sealing doors, patio doors and swing doors; entry doors

SUBSIDIARIES/SISTER BRANDS:

Starline Installations Ltd.

Therma-Tru Doors*

thermatru.com
Maumee, OH
800/843-7628

PRODUCTS MANUFACTURED:

Fiberglass and steel entry doors, impact-rated fiberglass doors, door system components

SUBSIDIARIES/SISTER BRANDS:

Larson, Fiberon, Fypon, Solar Innovations, MasterLock, American Lock, SentrySafe, Moen, House of Rohl, Perrin & Rowe, Riobel, Victoria +



Photo courtesy of Marvin

Albert, Aqualisa, Rohl and Shaws England

YKK AP America

ykkap.com
Atlanta, GA
678/838-6000

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, multi-panel vinyl doors
SUBSIDIARIES/SISTER BRANDS:
Erie Architectural Products

\$300 MILLION TO \$500 MILLION

Harvey Building Products*

harveybuildingproducts.com
Waltham, MA
800/822-0437

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl doors, wood clad windows, fiberglass entry doors, steel entry doors
SUBSIDIARIES/SISTER BRANDS:
Harvey Windows & Doors; Thermo-Tech Premium Windows and Doors; SoftLite Windows and Doors; Northeast Building Products Windows and Doors

Novatech*

groupenovatech.com
Sainte-Julie, Quebec, Canada
844/986-8001

PRODUCTS MANUFACTURED:
Steel and fiberglass entry doors, vinyl patio doors, door glass, vinyl frames, injection-molded frames, louvers
SUBSIDIARIES/SISTER BRANDS:
RSL Inc.

ODL

odl.com
Zeeland, MI
800/253-3900

PRODUCTS MANUFACTURED:
Door glass inserts with high performance plastic frame, impact door glass inserts with aluminum frames, enclosed blinds (aluminum) patio doors, enclosed blinds IGs, fiberglass doors, steel doors
SUBSIDIARIES/SISTER BRANDS:
Verre Select, Robover, and Tru Tech Doors

Sierra Pacific Windows*

sierrapacificwindows.com
Red Bluff, CA
800/824-7744

PRODUCTS MANUFACTURED:
Aluminum-clad doors and windows, bi-fold doors and windows, curtain wall, impact-resistant doors and windows, multi-panel doors, multi-slide pocketing doors, pivot doors, sliding doors; vinyl casement windows, doors, patio doors, replacement doors and windows; sliding doors, windows, window wall, wood patio doors and windows; wood-clad windows and doors

Steves & Sons Inc.*

stevesdoors.com
San Antonio, TX
800/627-5111

PRODUCTS MANUFACTURED:
Barn doors, bi-fold doors, entry doors, fiberglass entry and patio doors, glass exterior and interior doors, interior doors, patio doors, prehung doors, steel doors, wood entry and patio doors

Woodgrain Millwork*

woodgrain.com
Fruitland, ID
888/783-5485

PRODUCTS MANUFACTURED:
Wood-clad, wood, aluminum-clad, composite and vinyl windows; wood-clad and vinyl patio doors; wood-clad, wood, aluminum-clad, and fiberglass entry doors
SUBSIDIARIES/SISTER BRANDS:
Huttig Building Products

Champion*

championwindow.com
Cincinnati, OH
877/424-2674

PRODUCTS MANUFACTURED:
Vinyl windows

Fenplast Inc.

fenplast.com
Candiac, Québec, Canada
514/990-0012

PRODUCTS MANUFACTURED:
Vinyl windows, wood windows, vinyl patio doors, aluminum patio doors, steel doors, wood doors, interior doors
SUBSIDIARIES/SISTER BRANDS:
Altek Portes et Fenêtres; Altek Installation; Fenêtres Lajeunesse inc.; Solarcom inc.; Ramp-Art; ADG Portes et Fenêtres inc.; Portes et Fenêtres Magog inc.; Portes et Fenêtres Rimouski inc.; Portes et Fenêtres Rive-Sud; Portes et fenêtres Sorel inc.; Portes et fenêtres Terrebonne; Portes et Fenêtres Lac-Brome inc.; Bourcier Portes et Fenêtres inc.; Portes et Fenêtres Québec inc.; Fenex Windows and Doors; Comfort King Limited Portes et Fenêtres Saint-Hilaire inc.; Portes et Fenêtres Saint-Jérôme inc.; Vitrierie Repentigny inc.;



Portes et Fenêtres De Villers inc.; Ouellet Portes et Fenêtres inc.; Édificom inc.

Kolbe & Kolbe Millwork Co.*

kolbewindows.com
Wausau, WI
715/842-5666

PRODUCTS MANUFACTURED:
Wood, vinyl and aluminum windows and patio doors

Polaris Windows and Doors*

polariswindows.com
Austintown, OH
216/926-6151

PRODUCTS MANUFACTURED:
Vinyl windows and patio doors; steel and fiberglass entry doors

Quaker Windows and Doors

quakerwindows.com
Freeburg, MO
800/347-0438

PRODUCTS MANUFACTURED:
Vinyl windows, clad windows, wood windows, vinyl patio doors, aluminum doors, multi-slide pocketing aluminum clad doors, wood doors

Trimlite

trimlite.com
Renton, WA
425/251-8685

PRODUCTS MANUFACTURED:
Interior doors, wood doors, interior doors, doorlites
SUBSIDIARIES/SISTER BRANDS:
Builders Hardware, Codel Doors, Francis-Schulze

United Window & Door

unitedwindowmfg.com
Springfield, NJ
732/310-6667

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, multi-panel vinyl doors, cellular vinyl windows

Weather Shield Mfg.*

weathershield.com
Medford, WI
800/222-2995

PRODUCTS MANUFACTURED:
Wood, aluminum-clad wood, aluminum, vinyl-clad wood, fiberglass, fiberglass-clad wood windows and patio doors

\$100 MILLION TO \$200 MILLION

All Weather Windows*

allweatherwindows.com
Edmonton, Alberta, Canada
780/451-0670

PRODUCTS MANUFACTURED:
Vinyl windows, clad windows, fiberglass and steel entry doors, patio doors, multi-panel vinyl doors

Boral Windows*

boralwindows.com
Atlanta, GA
469/862-5178

PRODUCTS MANUFACTURED:
Vinyl and aluminum windows and aluminum patio doors

Crystal Window & Door Systems

crystalwindows.com
Flushing, NY
718/961-7300

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, aluminum patio doors, fiberglass entry doors
SUBSIDIARIES/SISTER BRANDS:
Crystal Pennsylvania Window

& Door Systems Crystal Pacific Window & Door Systems (Crystal California) Crystal Illinois Window & Door Systems (Crystal Chicago)

Durabuilt Windows & Doors

durbuiltwindows.com
Edmonton, Alberta, Canada
780/455-0400

PRODUCTS MANUFACTURED:
Vinyl windows, fiberglass entry doors, vinyl sliding/folding doors, fiberglass windows and doors, aluminum doors, hollow metal doors, aluminum-PVC-clad windows, skylights

Earthwise Group LLC

earthwisewindows.com
Liberty Township, OH
513/755-6707

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, multi-panel vinyl doors
SUBSIDIARIES/SISTER BRANDS:
Acadian Windows, Advanced Window Products, D&W Windows, Dasan Glass & Windows, Eastern Architectural Systems, Energy Shield Windows, Home Guard Industries, JetAlum, Mercury Excelum, RJT Industries, Sprouse Windows, Synergy Windows, US Energy Windows, Western Window

Elevate Windows and Doors

elevatewindows.net
Grand Prairie, TX
469/490-1100

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors

Lincoln Windows & Patio Doors

lincolnwindows.com
Merrill, WI
715/722-0751

PRODUCTS MANUFACTURED:
Wood windows, multi-slide pocketing aluminum clad doors, wood doors

Lindsay Windows

lindsaywindows.com
North Mankato, MN
507/461-2542

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, multi-panel vinyl doors, fiberglass entry doors
SUBSIDIARIES/SISTER BRANDS:
Lindsay Windows Missouri LLC, Lindsay Windows Illinois LLC, Lindsay Windows Georgia LLC, Lindsay Windows Washington LLC, Lindsay Windows California LLC, Lindsay Windows Texas LLC

Loewen Windows and Doors

loewen.com
Steinbach, Manitoba Canada
431/305-0888

PRODUCTS MANUFACTURED:
Clad windows, wood windows, multi-slide pocketing aluminum clad doors, wood doors

Lux Windows and Doors

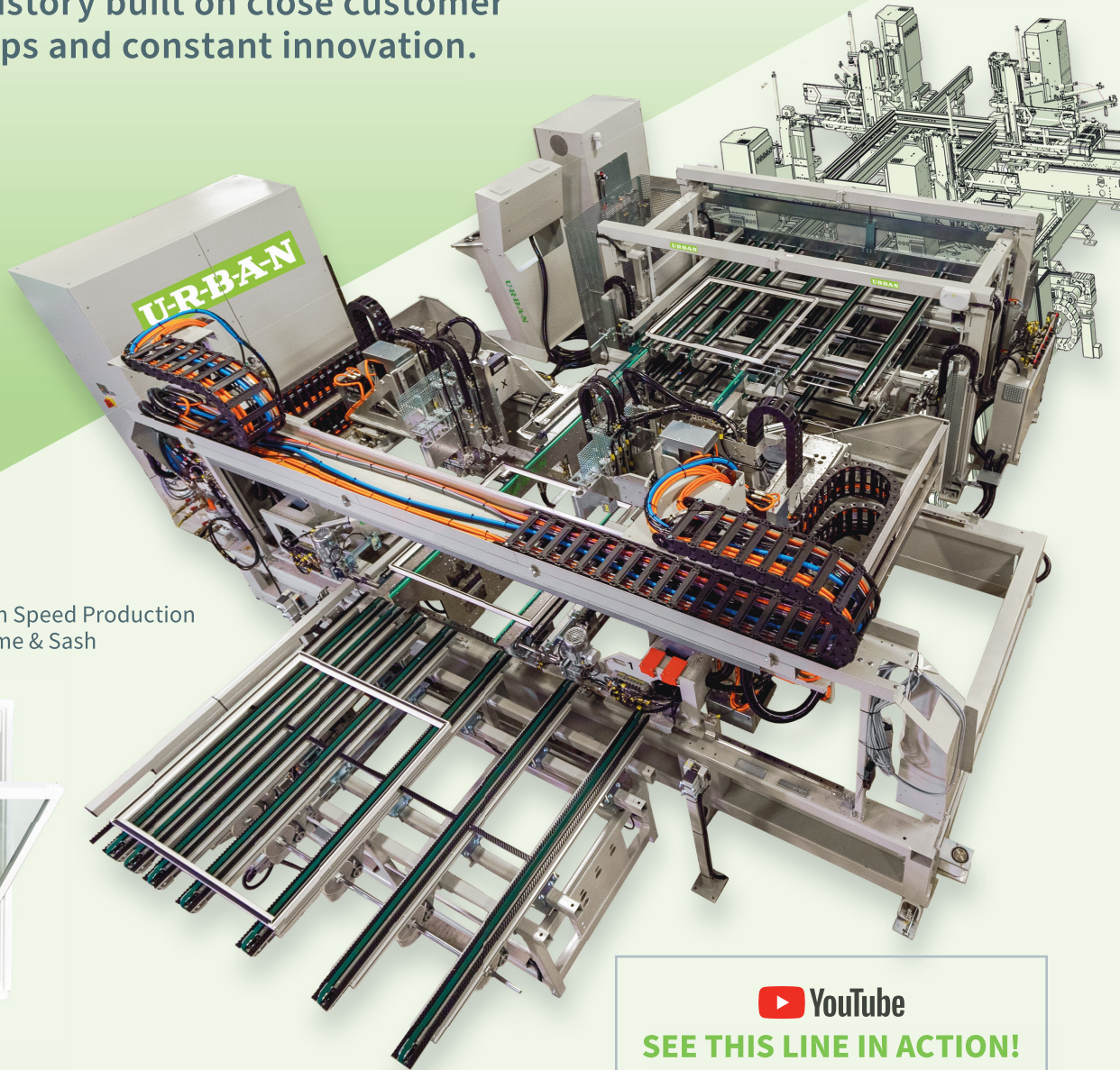
luxwindows.com
Calgary, Alberta, Canada
403/276-7770

PRODUCTS MANUFACTURED:
Vinyl windows, clad windows, wood windows, vinyl patio doors, aluminum patio doors, multi-panel vinyl doors, fiberglass entry doors

AUTOMATION CONCEPT – PLANNING – EXECUTION

A proven history built on close customer relationships and constant innovation.

Hung Window High Speed Production Machinery for Frame & Sash



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youtube.com/UrbanMachinery

urban-machinery.com

1-800-263-4216

U-R-B-A-N

Trust. Right from the start!



Photo courtesy of Marvin

Midway Windows and Doors

midwaywindows.com

Chicago, IL

708/594-2600

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors, multi-panel vinyl doors

Plastpro*

plastproinc.com

Los Angeles, CA

310/693-8600

PRODUCTS MANUFACTURED:

Fiberglass entry doors, polyfiber door frames, glass inserts, vinyl planking, wainscoting

Trinity Glass International*

trinityglass.com

Federal Way, WA

253/875-6700

PRODUCTS MANUFACTURED:

Door glass, entry doors, fiberglass entry and patio doors, fire-rated doors, impact-resistant doors and vinyl patio doors, patio doors

SUBSIDIARIES/SISTER BRANDS:

Signamark, Feather River Doors

Viwinco Inc.

viwinco.com

Morgantown, PA

610/286-8884

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors, multi-panel vinyl doors

Wallside Windws

wallsidewindows.com

Taylor, MI

313/292-4400

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors

Wincore Windows and Doors

wincorewindows.com

Parkersburg, WV

304/424-3880

PRODUCTS MANUFACTURED:

Fiberglass entry doors, vinyl windows, vinyl patio doors, fiberglass entry doors

Window Designs Group*

vinylwindowdesigns.com

Toronto, Ontario, Canada

416/741-7820

PRODUCTS MANUFACTURED:

Vinyl windows and patio doors, aluminum windows, steel entry doors, fiberglass entry doors

SUBSIDIARIES/SISTER BRANDS:

Vinyl Window Designs, Aluminum Window Designs, The Vinyl Company, Performance Windows & Doors, Vinylbilt

\$75 MILLION TO \$100 MILLION

Air Master Windows and Doors

airmasterwindows.com

Barceloneta, Puerto Rico

787/623-1800

PRODUCTS MANUFACTURED:

Impact-resistant windows and doors

Arcadia Custom*

arcadiacustom.com

Vernon, CA

303/665-5700

PRODUCTS MANUFACTURED:

Steel, thermal aluminum and wood windows; steel, thermal aluminum and wood swing, sliding and pivot doors; wood entry doors; wood interior doors; impact-rated windows;

impact-rated swing and sliding doors

Centra Windows

centrawindows.com

Langley, BC, Canada

888-534-3333

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors

OpenView Products LLC

openviewproducts.com

Missouri City, TX

713/228-3761

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors

SUBSIDIARIES/SISTER BRANDS:

Hayfield Window and Door, Showcase Window and Door

Regal Aluminum Windows & Doors

regalaluminum.com

Concord, ON, Canada

905/738-4375

PRODUCTS MANUFACTURED:

Vinyl windows and patio doors

SUBSIDIARIES/SISTER BRANDS:

Progress Doors Limited, Regal Windows & Railings Systems Inc.

Simpson Door Company

simpsondoor.com

McCleary, WA

800/746-7766

PRODUCTS MANUFACTURED:

Wood doors

Skyline Windows

skylinewindows.com

New York, NY

973/809-7004

PRODUCTS MANUFACTURED:

Aluminum double hung windows, tilt & turns, inswing

and outswing casements, terrace doors, lift & slide doors, window wall

SUBSIDIARIES/SISTER BRANDS:

Skyline Interiors (a division of Skyline Windows)

Thompson Creek Window Co.*

thompsoncreek.com

Lanham, MD

866/572-7335

PRODUCTS MANUFACTURED:

Replacement vinyl windows and patio doors, steel and fiberglass entry doors

Vinylmax Windows

vinylmax.com

Hamilton, OH

513/772-2247

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors

ViWinTech Window & Door Inc.*

viwintech.com

Paducah, KY

800/788-1050

PRODUCTS MANUFACTURED:

Vinyl windows and patio doors

Window Mart*

windowmart.com

Royal, AR

888/283-6278

PRODUCTS MANUFACTURED:

Vinyl windows and patio doors

\$50 MILLION TO \$75 MILLION

Builders FirstSource*

buildwithbmc.com

Marietta, GA

770/429-9285

PRODUCTS MANUFACTURED:

Vinyl windows

Castle Windows*

castlewindows.com

Mount Laurel, NJ

800/360-4400

PRODUCTS MANUFACTURED:

Vinyl replacement, casement, awning, garden, and slider windows, steel and fiberglass doors

Conservation Windows*

conservationwindows.com

Mount Carmel, PA

570/339-3374

PRODUCTS MANUFACTURED:

Vinyl replacement windows, sliding glass doors, impact- and non-impact replacement windows

Gerkin Windows and Doors

gerkin.com

South Sioux City, NE

402/494-6000

PRODUCTS MANUFACTURED:

Vinyl windows, vinyl patio doors, aluminum patio doors

LePage Millwork*

lepagemillwork.com

Quebec, Canada

877/289-0191

PRODUCTS MANUFACTURED:

Wood and aluminum-clad windows and doors, vinyl windows and doors, hybrid aluminum/vinyl windows, steel doors

Mathews Brothers Co.

mathewsbrothers.com

Belfast, ME

207/338-3360

PRODUCTS MANUFACTURED:

Vinyl windows and patio doors

MGM Industries

mgmindustries.com



Hendersonville, TN
615/824-6572

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors

Northeast Windows USA Inc.

northeastwindowsusa.com
Merrick, NY
516/378-6577

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio door

SUBSIDIARIES/SISTER BRANDS:
Quality Lineals USA, INC.

NT Window Inc.

ntwindow.com
Fort Worth, TX
800/969-8830

PRODUCTS MANUFACTURED:
Vinyl windows, aluminum windows, Impact windows, vinyl patio doors, aluminum patio doors, sunrooms

Premium Windows*

premiumwindows.com
Corona, CA
562/630-9696

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl doors, aluminum doors, aluminum windows

Vytex Windows

vytexwindows.com
Laurel, MD
877/747-8735

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, multi-panel vinyl doors

\$40 MILLION TO \$50 MILLION

ATI Windows*

vinylwindows.co

Riverside, CA
909/946-3697

PRODUCTS MANUFACTURED:
Vinyl casement windows, multi-panel patio doors, patio doors, replacement doors and windows, sliding doors and windows

SUBSIDIARIES/SISTER BRANDS:
ABC Window Systems

Croft LLC*

croftllc.com
Magnolia, MS
800/222-3195

PRODUCTS MANUFACTURED:
Aluminum and vinyl windows and patio doors

FrontLine Bldg. Products Inc.

frontlinebldg.com
Green Bay, WI
920-393-1340

PRODUCTS MANUFACTURED:
Exterior entry door cladding, windows, geometric windows, door transoms, grilles, commercial doors, commercial storefront grilles
SUBSIDIARIES/SISTER BRANDS:
FrontLine Bldg. Products, Inc. Medford, WI Division, FrontLine Bldg. Products, Inc. - Merrill, WI Division

GlassCraft Door Co.

glasscraft.com
Houston, TX
713/690-8282

PRODUCTS MANUFACTURED:
Fiberglass doors, wood doors, barn doors, door components

Hope's Windows Inc.*

hopeswindows.com
Jamestown, NY
716/665-5124

PRODUCTS MANUFACTURED:
Steel and bronze windows and doors, hurricane- and

impact-rated windows and doors

International Window

intlwindow.com
Corona, CA
800/477-4032

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, aluminum patio doors, multi-slide pocketing aluminum clad doors, aluminum windows

SUBSIDIARIES/SISTER BRANDS:
Precision Screen, Vista Security Screens, Universal Molding, Anaheim Extrusion

Okna Windows Manufacturing*

oknawindows.com
Bristol, PA
215/788-7000

PRODUCTS MANUFACTURED:
Vinyl and composite windows and patio doors

Solaris International*

solaris-intl.com
Quebec, Canada
800/363-0643

PRODUCTS MANUFACTURED:
Vinyl windows and patio doors, hybrid windows (aluminum exterior, PVC interior)

Sun Windows Inc.

sunwindows.com
Owensboro, KY
270/929-5990

PRODUCTS MANUFACTURED:
Clad wood windows, clad wood doors, clad wood multi-sliding pocketing doors, aluminum clad vinyl window

The Coeur d'Alene Window Company

coeuralenewindow.com
Spokane, WA
509/340-0705

PRODUCTS MANUFACTURED:
Patio doors; vinyl multi-panel patio doors, patio doors, replacement doors and windows, sliding doors and windows

SUBSIDIARIES/SISTER BRANDS:
McVay Brothers Inc.

\$30 MILLION TO \$40 MILLION

All Weather Architectural Aluminum*

allweatheraa.com
Vacaville, CA
800/680-5800

PRODUCTS MANUFACTURED:
Aluminum windows and doors

Comfort View Products

comfortviewproducts.com
Newnan, GA
770/251-4050

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors

Gilkey Window

gilkey.com
Cincinnati, OH
513/310-7380

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl doors, fiberglass windows, fiberglass doors

Innotech Windows + Doors

innotech-windows.com
Langley, BC, Canada
604/854-1111

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, uPVC entry doors

Interstate Window & Door Co.

interstatebldg.com
Pittston PA
570/905-2716

PRODUCTS MANUFACTURED:
Vinyl windows,
CompositWood windows
SUBSIDIARIES/SISTER BRANDS:
IWD Installation + Services
Inc.

Joyce Manufacturing Company

joycemfg.com
Berea, OH
800/824-7988

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio
doors, Vinyl Sunrooms, Screen
Rooms, Insulated Patio Roofs
SUBSIDIARIES/SISTER BRANDS:
Joyce Factory Direct

Slocomb Windows and Doors Inc.

slocombwindows.com
Wilkes-Barre, PA
570/825-3675

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio
doors

Stanley Doors*

stanleydoorproducts.com
Joubert, Montreal, Canada
877/290-0941

PRODUCTS MANUFACTURED:
Fiberglass and steel entry
doors; patio doors; decorative
glass

Taylor Entrance Systems*

taylordoor.com
West Branch, MI
800/248-3600

PRODUCTS MANUFACTURED:
Fiberglass and steel entry
doors
SUBSIDIARIES/SISTER BRANDS:



Photo courtesy of Vector Windows and Doors



Waudena Entrance Systems and Diamond Kote Building Products

Vector Windows & Doors

vectorwindows.com
Fergus Falls, MN
218/739-9899

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors

\$20 MILLION TO \$30 MILLION

EuroLine Windows Inc.

euroline-windows.com
Delta, BC Canada
604/640-8485

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, aluminum patio doors, multi-panel vinyl doors

Everlast Group of Companies*

everlastproducts.ca
Etobicoke, Ontario, Canada
800/897-5118

PRODUCTS MANUFACTURED:
Aluminum patio doors, porch enclosures, sliding doors
SUBSIDIARIES/SISTER BRANDS:
Napa Valley Doors by Everlast and Alberta Vinyl Windows and Doors

Ideal Window Manufacturing

idealwindow.com
Bayonne, NJ
800/631-3400

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors

Inline Fiberglass Ltd. *

inlinefiberglass.com

Toronto, Ontario, Canada
866/566-5656
PRODUCTS MANUFACTURED:
Fiberglass windows and patio doors

Madero

madero.ca
Calgary, AB, Canada
306/220-8686

PRODUCTS MANUFACTURED:
Steel doors, fiberglass entry doors, interior doors
SUBSIDIARIES/SISTER BRANDS:
Penner Doors And Hardware Security Building Supplies West Four Distribution WSI Modular West Four Aluminum TwoSix Creative

Moss Supply Co.*

mosssupply.com
Charlotte, NC
704/900-1634

PRODUCTS MANUFACTURED:
Vinyl windows and doors

Vinyl Kraft Inc.*

vinylkraft.com
New Boston, OH
740/456-4949?

PRODUCTS MANUFACTURED:
Vinyl windows and patio doors

Winchester Industries

winchesterwindows.net
Saltsburg, PA
724/639-3551

PRODUCTS MANUFACTURED:
Vinyl windows, steel doors, vinyl patio doors

\$15 MILLION TO \$20 MILLION

Alpen High Performance Products

thinkalpen.com
Louisville, CO

206/963-4167
PRODUCTS MANUFACTURED:
Clad windows, vinyl windows, Fiberglass and Fiber-reinforced uPVC Composite windows and doors

Ikon Windows LLC

ikonwindows.com
Brooklyn, NY
888/365-4934

PRODUCTS MANUFACTURED:
Multi-slide pocketing aluminum clad doors, vinyl windows, steel doors, steel windows

Kensington HPP Inc

khpp.us
Vandergrift, PA
724/845-5300

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors

Thermal Windows, Inc.

thermalwindows.com
Tulsa, OK
918/663-7580

PRODUCTS MANUFACTURED:
Aluminum patio doors, Thermally broken aluminum windows and doors, vinyl windows

Upstate Door

upstatedoor.com
Warsaw, NY
800/570-8283

PRODUCTS MANUFACTURED:
Wood doors, wood windows, interior doors, wood patio doors, wood overhead doors

LESS THAN \$15 MILLION

Aurora Doors & Windows

auroradoorsandwindows.com

Wheeling, IL
847/804-4280
PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors

Climate Solutions Windows & Doors

cswindows.com
Franklin Park, IL
847/233-9800

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, multi-panel vinyl doors

Glass Rite

glass-rite.com
Albuquerque, NM
505/764-9899

PRODUCTS MANUFACTURED:
Vinyl windows, insulated glass

Prestige Entries

prestigeentries.com
Hammond, LA
214/559-0071

PRODUCTS MANUFACTURED:
Wood doors, interior barn doors

Seaway Mfg. Corp.

Erie, PA
seawaymfg.com
814/898-2255

PRODUCTS MANUFACTURED:
Vinyl windows, vinyl patio doors, aluminum sunrooms, patio covers, breezeways, fill-in sunrooms, year-round sunrooms, three-season sunrooms

Stewart Brannen Millworks

brannenmillwork.com
Register, GA
912/488-2397

PRODUCTS MANUFACTURED:
Wood windows, wood doors, interior doors

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Products



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01

As seen at Fensterbau Frontale in Nuremberg, Germany, in March 2024

02



03

01. Roto North America

One of the main characteristics of the Roto NX product range is that many of the same parts are utilized in each model, reducing the number of components for storage and logistics, according to the company. With eight different hinge sides, Roto NX makes it possible to flexibly manufacture tilt and turn windows in various formats, weights and designs. All hinge sides have been designed to be processed manually, partially or fully automatically, and are easy to adjust.

860/526-4996 | ROTONORTHAMERICA.COM

02. Renolit

Renolit GEOFOL FH is a decorative film for laminating outside decking panels. Corundum components provide abrasion resistance, while a rough surface structure ensures slip resistance, says the company. A special UV protective layer also protects the printing inks from fading. The foldable cladding panel for components around PVC-U windows is available in selected Renolit EXOFOL decors. The product consists of an aluminum composite panel with a laminated foil surface that can be cold formed.

616/554-2230 | RENOLIT.COM

03. Veka

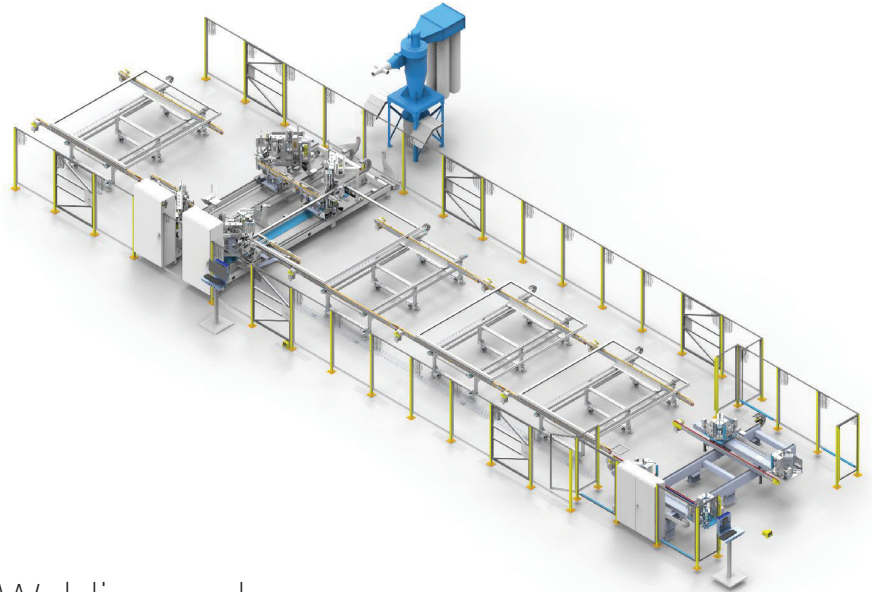
Veka Spectral is a design surface intended to give PVC-U windows and doors aesthetic dimension, according to the company. The surface technology combines through-dyed PVC film with a hardened coating layer. It is dust-repellent and easy to clean thanks to the anti-fingerprint effect. It is available in continuously expanding color shades. The design surface has an ultra-matte surface finish and high resistance to mechanical and chemical influences.

724/452-1000 | VEKAINC.COM

Product/Solution

Key features

- Configured to specific product and production needs
- Easy maintenance and high uptime
- Common interface and user experience



jWeld, jClean and jFlow Welding and Cleaning Solutions // **Joseph Machine**

Joseph Machine's new jWeld, jClean and jFlow product lines are designed to help North American manufacturers thrive. As the leading producer and designer of fabrication solutions for window and door vinyl extrusions, Joseph applied its "common sense" engineering philosophy to a new lineup of welding and cleaning solutions.

Approach

The Joseph solutions take a modular approach with the base platforms for welding and cleaning, able to be configured to your specific product and production needs. For example, the jWeld platform can easily be converted from hydro-pneumatic clamping to full servo control. The jClean platform has dedicated frame or sash solutions as well as a combo product that can accommodate frame or sash.

Solutions

Our large installed base of fabrication centers gives us unique insight into what our customers require from an operation and maintenance standpoint for vinyl welding and cleaning. When we developed our jFlow pass-thru lines, we took into account our customers' space constraints and issues with existing systems on the market. The result is a product that has just the right level of automation to reduce labor for welding and cleaning but also the right components and simplified engineering to allow for easy maintenance and high uptime.

Results

Our software also enables us to offer customers a common interface and user experience from "stick to opening" so that if a team member understands the logic of a fab center, interacting with a welder and a cleaner is easy and intuitive.

For more information, visit josephmachine.com ■

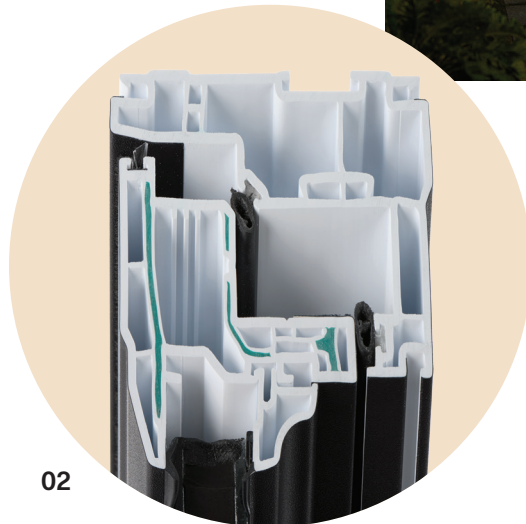


➔ Products



01

03



02

01. Hegla

Hegla's Renault Master is an option for converting a vehicle into a glass industry vehicle. An exterior rack allows fitters to ergonomically set the glass, window or structural element down on the rack without having to enter the interior or lift the load accordingly. Anti-slip, solid rubber profiles protect the surfaces of the load and enable professional transport. The load is secured by height-adjustable slat bars. If more support is required, the two lashing rails provide greater security.

419/335-2244 | HEGLA.COM

02. North Star Windows & Doors

North Star Windows & Doors casement and awning windows now include a next-generation, European-engineered, UltraStar co-extruded reinforcement. This reinforcement is designed to be more stable than traditional vinyl window metal reinforcements, according to the company.

800/265-5701 | NORTHSTARWINDOWS.COM

03. Cornerstone Building Brands

Cornerstone Building Brands' Ply Gem Perspective Multi-Slide Vinyl Patio Door now has co-extruded exterior black and bronze color options with a white interior, expanded sizes of up to 10 feet in height or 30 feet in width and the addition of black and bronze color choices, and an expanded range of sizes. Applied using co-extrusion that will retain its color and character in any climate, the new color options offer all-season durability; scratch, scrape and scuff resistance and more.

800/746-6686 | SIMONTON.COM

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Quanex Building Products	13		quanex.com
Roto North America	3	800/243-0893	rotonorthamerica.com
Schweiss Doors	22		schweissdoors.com
Stürtz Machinery	60	330/405-0444	sturtz.com
Triple Diamond Glass	25		tripldiamond.com
Urban Machinery	47	800/263-4216	urban-machinery.com
Vision Hardware	27	800/220-4756	visionhardware.com
Wakefield Equipment	16	440/899-5658	wakefieldequipment.com

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The New American Home

A MODEL HOME, SHOWCASED AT THE 2024 NAHB INTERNATIONAL BUILDERS' SHOW FEATURES HIGH PERFORMANCE FENESTRATION

Project: The New American Home

Products: Western Window Systems' Series 600 multi-slide door, Masonite performance door system.

Description: Visitors to the 2024 NAHB International Builders' Show in Las Vegas experienced fenestration and residential building products at the New American Home.

This year's model home featured fenestration products, which were credited with raising the project's performance. The building performance breakdown reports a U-factor average of 0.34 and a solar heat gain coefficient average of 0.24.

Western Window Systems contributed its Series 600 multi-slide door. Doors in this series offer wide panels and multiple sill

height options, with panels up to 12 feet tall, with a maximum of 70 square feet.

The project also featured Masonite's performance door system, a fiberglass door with a rot-resistant frame, equipped with a 4-point performance seal designed to insulate the home from air and water intrusion.

Fensterbau 2024 Highlights

By Emily Thompson

Fensterbau made a strong return this March in Nuremberg, Germany, with more than 600 exhibitors across the expanse of nine full halls and a reported attendance of around 75,000 overall visitors. The crowds and exhibits were telling of a healthy and engaged industry focused on networking, education and innovation.

What relevance does this show have for the North American market? While many of the specific trends don't translate one-to-one—for example, European fenestration is going to have a lot more hardware and a lot more reinforcement—the challenges for fabricators can be a consistent worth exploring. "This event gives us an opportunity to see what types of capabilities they're developing based on European problems and European manufacturing challenges," Laura Doerger-Roberts, Vinylmax Windows, says. "Those usually translate into similar challenges American fabricators have. Seeing how that technology and innovation can bring more efficiency and more consistency to our facilities is important to us."

Further, as Marco Patermann, U.S. representative for Continental and Fux Machinery states, "Customers come from all over the world, including the United States and Canada, to see what's new.



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WINDOWANDDOOR.COM

Creative Millwork Grille Products



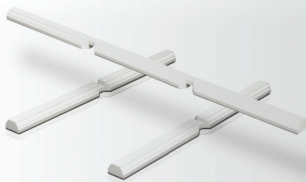
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