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**MANUFACTURERS
MARK ANOTHER
YEAR OF GROWTH
AND INCREASED
DEMAND**

**PLUS: THE TOP
MANUFACTURERS
LIST**

THE MANUFACTURING ISSUE

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Residential fenestration coverage, from source to sale // windowanddoor.com // Vol. 30, No. 3 // May/June 2022

Window + Door Top Manufacturers

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Manufacturers mark another year of growth and increased demand while navigating material and labor constraints.

By Laurie Cowin

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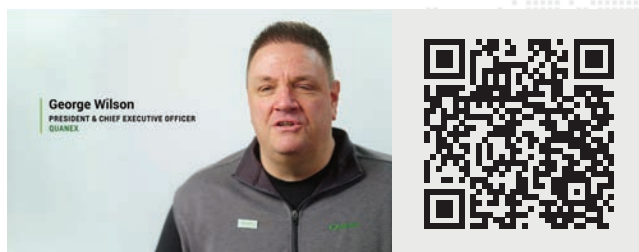
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On the Cover: Vector Windows &
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to \$40 million in 2021. See the full
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Top Manufacturers Photo Gallery

See photos of factory floors, team members in action and products from companies on this year's Top Manufacturers list.

National Glass Association's Glass and Glazing Advocacy Day

Leaders in the architectural glass and

fenestration industries met with Congressional representatives to discuss challenges and opportunities facing the industry. The discussions allowed business leaders to communicate pain points and challenges, provide critical information about glass as a sophisticated building material, and seek clarity on the

best legislative routes to take in confirming glass's place in the built environment.

Women in Construction Week

NGA recognized Women in Construction Week, March 6-12. Visit glass.org for profiles of women in fenestration and glass, and more recruitment and hiring resources.

➔ The Talk // Blogs of the Month

Catch up on all the latest industry "talk" at windowanddoor.com/blogs



Want Women in Your Workplace? Be Flexible

By Norah Dick



Why Fenestration is a Crucial Part of a Sustainable Future

By Michelle Blackston



Define an Innovation Process

By Janice Yglesias

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News

IN THE KNOW



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Industry Companies Garner Awards

Andersen Corp. has been named a Forbes Best Employer for Diversity 2022 for the second year in a row. Honorees were chosen based on an independent survey by Statista Inc. where respondents answered questions regarding age, gender equality, ethnicity, disability, LGBTQ+ and general diversity.

Pella Corp. claimed the No. 8 spot on Fast Company's list of World's Most Innovative Design Companies for 2022 for its Easy-Slide Operator hardware solution. "Innovation and the continuous pursuit of a better way are at the heart of everything we do. To see the hard work of our team reflected in Fast Company's list this year is a tremendous achievement and a testament to the caliber of talent we have here at Pella," says Tim Yaggi, CEO of Pella.

Houzz named Milgard Windows & Doors to its Best of Houzz Design list for the eighth consecutive year. More than 65 million Houzz user reviews and photos saved to idea books determine the winners. Milgard had four winning photos this year, all of which featured black frames.

Company Growth, M&A Activity Continues

MI Windows and Doors revealed MITER Brands as its new parent brand. The nationwide company will retain two regional product brands: MI Windows and Doors in the East and Milgard Windows and Doors in the West. Sunrise Windows & Doors products will be available under the MI brand.

Centra Windows acquired Supreme Windows, allowing it to move into the Alberta, Canada, marketplace. This will be Centra's fifth location and second manufacturing plant. With the addition of the Supreme team, Centra will expand from 375 employee owners to 450.

Marvin opened its third facility in West Fargo, North Dakota, which will be the city's first distribution facility and is expected to bring with it 100 new jobs. The 150,000-square-foot facility will primarily consist of loading dock work, but will create a space for manufacturing work and assembly, including forklift drivers, engineers and purchasing employees, according to the company.

Woodgrain Inc. and Huttig Building Products Inc. reached a definitive agreement whereby Woodgrain will purchase Huttig in an all-cash transaction of approximately \$350 million, including the assumption of debt. The acquisition is intended to increase Woodgrain's distribution network, product offering and value-added service, according to a release.

FlexScreen opened a new plant in Nashua, New Hampshire, marking the company's seventh facility. Along with the new plant comes an expanded partnership with Harvey Building Products, which has several production facilities in New England and the surrounding areas.

Fortune Brands Home & Security Inc. announced its intent to separate into two publicly traded companies, with the Cabinets business becoming a stand-alone company. A potential separation will take 12 months to complete.

Finally, Trimlite Mfg Inc. acquired Builders Hardware Inc., a Tampa, Florida-based manufacturer of exterior door products and hardware.

IN THE NEWS:

Month in Review

Ubiquitous Energy demonstrated 1 ½-meter-wide glass coated uniformly with the company's UE Power transparent solar materials, showing the ability to scale UE Power to large sizes uniformly and paving the way for the company's upcoming high-volume manufacturing line that will produce 1 ½- by 3-meter floor-to-ceiling, transparent solar windows.

Roto North America updated its Roto Solid C concealed door hinge and introduced "ELA" special opening restrictors as a safety feature on large turn-only aluminum windows. **All Weather Architectural Aluminum** also launched new products: the Series 9200 thermally broken bifold door system and Series 7200 thermally broken pivot door system. And **Jeld-Wen's** new line of Auraline composite windows and patio doors is in production.

Crystal Window & Door Systems installed a nearly 1 MW solar electricity generation facility on the rooftop of its Queens, New York, headquarters, which includes over 2,300 solar panels and will offset about 35 percent of its overall electricity needs. Its West Coast affiliate, **Crystal Pacific Window & Door Systems**, celebrated its 10th year of operation.

VEKA Group announced its support for mental health and suicide prevention and will sponsor the Loneliest Road tour, held Sept. 24-Oct. 10 in North America.



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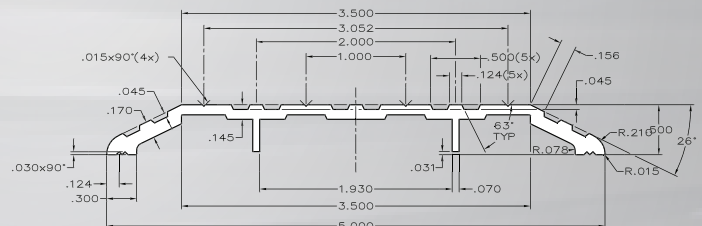
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Evidence of Growth

The Top Manufacturers Report and List shows just how much the industry is growing in a tricky business landscape



By
Laurie Cowin
EDITOR

Each year while compiling the Top Manufacturers List, I start with the previous year's list and do some comparing. An active mergers and acquisitions landscape always condenses several entries as those companies merge together under one entry, such as Centra Windows' acquisition of Supreme Windows and Cornerstone Building Brands acquiring Cascade Windows.

This year I noticed another big reason for shifts in the list compared to last year: revenue category jumps. It's hardly surprising. After all, 87 percent reported higher gross sales in 2021 compared to 2020 and nearly every survey respondent indicated increased demand. What surprised me was just how much.

In deference to knowing many companies in the residential fenestration space prefer to keep specific revenues private, we ask for broad revenue ranges. That vast ranges often mean it's unusual for companies to move revenue categories year-over-year. Nevertheless, at least a dozen companies on our list of approximately 100 indicated higher revenue categories than last year. This trend fits with market reports of burgeoning demand, a hot housing market and strong remodeling and replacement market.

Much of our readership, manufacturers and suppliers alike, report hectic business conditions from that demand. In fact, I can't have a conversation now without talking about operating at what sometimes feels like breakneck speed to keep up with booming business, let alone welcome new business. The challenges are several-fold, none of which are new, but all of which seem to be increasing in pressure.

The majority of survey respondents ranked material cost and availability as among the greatest headwinds. Allocation makes it difficult to get

enough material and in some cases where material can't be obtained, companies are re-engineering their products to exclude what they can't get and include alternative solutions.

One manufacturer shared the following example of how it adapted to material challenges to keep its production lines running:

"We have worked to adapt to this by constantly striving to be as flexible as possible, often thinking outside of the box. Interlayer, a critical component for impact product, remains in short supply across the market. Normally our company uses interlayer in roll form that is specifically optimized for our exact production lines and processes. Due to the various market shortages, we had to be flexible and switch to using various sizes of rolls and sheet just to keep the production lines running. We also have been striving to control more supplies internally and try to rely less on glass suppliers by utilizing our internal glass assets to supplement underperforming glass suppliers. We also spent significant time with our extruders to determine ways to change profiles in order to support them with efficiency gains during the extrusion process. This activity didn't lead to cost savings, but allowed the supplier to push more metal for us throughout their production runs. Lastly, we have been placing a lot of focus and energy on single-sourced parts and digging deep into our suppliers' supply chain to identify risk potential."

Although from some angles this year's survey paints a bleak picture of big challenges, from another angle the survey demonstrates just how innovative, adaptive and resilient this industry is. Despite significant and long-term headwinds that could dampen others' spirits and lessen their bottom lines, the exact opposite holds true for residential fenestration. ■

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The Argument for Wood Plastic Composites

5 benefits to WPCs that may help make the material more popular in the high-performance fenestration segment



**By Ross
DeMeritt**

When I became the new marketing manager for PVC windows at Rehau Plastic's North American division in 1985, PVC windows had less than 2 percent market share here, but in Europe PVC was rapidly replacing other framing materials. In North America, PVC now accounts for about 65 percent of the total market.

So, what is the biggest news on the framing material market? I would argue it is more widespread adoption of large window producers using PVC-based wood plastic composite (WPC) as a material of choice for high-performance fenestration.

Why WPCs?

Aside from product differentiation, the advantages are superior strength, lower expansion/contraction, less heat deformation, better U-values and "greenness." Let's examine each in turn.

1. Strength // Strength is well-known, with most of the fence/deck and rail industry long since moving to composites. There are higher flexural, compression and rupture modulus values. The wood fiber makes profiles stronger, and that means less need for metal reinforcement.

2. Expansion/Contraction // With one-third the expansion-contraction of traditional, hollow-rigid PVC, WPC profiles can have this coefficient be much closer to the glass, wood and metal to which they must mate.

3. Thermal Conductivity // Then we have K-factor, which is the natural heat and cold transmission of any material. We know that real wood is warm to the touch, and that's good because the K-factor for pine is about half of that for traditional, hollow-rigid PVC. That means that in any given profile, R-values will be higher for any compound replacing PVC with wood fiber.

4. Heat Deformation Resistance // Next is heat deformation resistance. Heat combined with pressure has always been a concern for PVC producers, with the darker colors requiring exterior paint or cladding treatments. With the market share

of darker colors increasing in general, and architectural specifications requiring an even greater percentage of dark colors, this WPC advantage is one of the most important attributes.

5. Greenness // We know architects are an important factor in high-end product selection, and as a group, they may be more concerned with green issues than the producers of the windows they specify. However, the more important these green issues become, the more important it will be to be able to self-certify your products as sustainable.

This is one reason thermoplastic composites made with a bio-component are more highly regarded than composites that are simply a "composite" of resins.

Also, with WPC profiles you can provide a "done on the extrusion line" surface treatment that is paintable/stainable with ordinary household paints. The profiles can be mechanically fastened or welded. Thickness options vary from "builder's grade" to premium commercial, and the profiles can be bent for round tops.

Conclusions

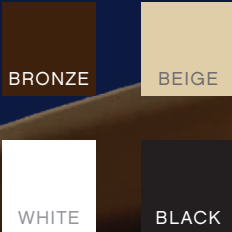
So, you are thinking it may be time to plan your next generation of fenestration products. Sure, demand is strong for current products and backlogged orders from COVID, but you also know that product development cycles take six to nine months if everything goes well.

In my 20 years with the Royal Plastics Group, we dealt with the complete process of framing material change, including arranging product design, extrusion dies and fabrication dies, in most cases from wood and aluminum to PVC. It may now be time to look at the next generation of framing material choices. ■

Ross DeMeritt is president of Window Choice Co. Inc., with offices in Sautee, Georgia, and Mackinaw City, Michigan. He can be reached at ross@worldwidewindowdesign.com.

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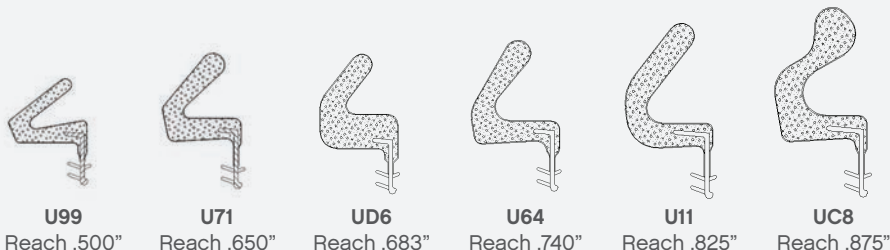
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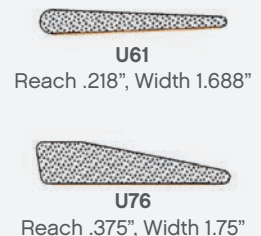
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Policy, Regulation to Watch

Tax credits, trade, regulation around safety and supply chain issues are major players in the current legislative and regulatory landscape

By Laurie Cowin

In late March, the Biden administration lifted steel and aluminum tariffs from the United Kingdom that former president Donald Trump imposed in 2018. Industry groups applauded the action, while also taking the opportunity to encourage the administration to similarly re-examine tariffs on Canadian softwood lumber.

“The Biden administration’s move to end steel and aluminum tariffs from the United Kingdom is a welcome development and a positive first step that can help lower construction and housing costs,” said Jerry Konter, chairman of the National Association of Home Builders. “The administration must now act with the same sense of urgency to negotiate a new agreement with Canada that will eliminate tariffs on softwood lumber shipped into the U.S.

“As the construction and manufacturing industries continue to grapple with supply chain challenges and record-high price volatility, this action by the Administration is an important step to help stabilize supply and improve conditions for residential construction,” said Michael O’Brien, Window & Door Manufacturers Association president and CEO, in a statement. “Moving forward, WDMA encourages the Administration to also re-examine tariffs on Canadian softwood lumber and Chinese imports subject to Section 301 tariffs.”

Notable though this tariff lifting is, it’s merely the tip of legislative and regulatory topics to watch in the coming year. The WDMA 2022 Spring Meeting and Legislative Conference, March 30-31, addressed myriad topics and highlighted what might impact the industry moving forward.

Build Back Better Act and tax credits

Although the Build Back Better Act did not pass the Senate, Kevin McKenney, vice president, government affairs, WDMA, said it’s still worth addressing several provisions. He specifically referenced a proposed minimum 15 percent corporate tax on corporations that book income with profits more than \$1 billion.

Several efficiency tax credits also bear examination, McKenney said:

- 25C increases the percentage of credit from 10 percent of the cost to 30 percent and replaces lifetime cap on credits with a \$1,200 annual credit. It also creates a new credit level of \$600 for Energy Star most-efficient windows and

removes all skylights from 25C credit eligibility. Manufacturers and taxpayers must comply with reporting the ID number of certain properties, including windows, to access the credits.

- 25D extends the full 30 percent tax credit for eligible products through 2031 before it phases down to 26 percent in 2032 and 22 percent in 2033.
- 45L extends the credit for energy-efficient new homes through 2031, with the single-family criteria being that of the Energy Star Single-Family New Homes Program. There is also a \$5,000 credit for single-family and manufactured new homes certified as zero-energy ready.

Much of WDMA’s lobbying efforts focused around 25C, said McKenney. “We see this as unworkable for manufacturers.” He believes his team made “significant progress” in getting some members of Congress to see issues with the way it was written. “There’s no real justification for creating this new credit level for essentially triple-pane products,” he said. He added the credit level for windows should be at least \$1,000.

Trade and tariffs

A lot of focus revolves around the America Competes Act, which addresses trade imbalances Congress sees with China and unfair trading practices they’re engaged in, much of which focuses on semiconductors, said McKenney.

In addition to the lifting of U.K. steel and aluminum tariffs, efforts are also underway for the administration to reopen exclusion requests for Chinese products (Section 301).

Regulatory updates

OSHA withdrew its Emergency Temporary Standard around COVID-19 vaccinations after the Supreme Court ruling blocked it, but it still remains an active proposed rule. As of late March, it’s unclear if OSHA will move forward with the rulemaking, said McKenney.

In late 2021, OSHA issued advance notice of proposed rulemaking for a heat illness and prevention standard that would protect workers who “work outdoors in agricultural, construction and delivery services, as well as workers in such indoor facilities as warehouses, factories and kitchens.” Specific considerations include heat stress thresholds, heat

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acclimatization planning, exposure monitoring and strategies to protect workers. Biden's administration said it would prioritize work inspections on days where the heat index exceeds 80 F.

Supply chain challenges

Representatives from the U.S. Chamber of Commerce shared insight as to the current supply chain challenges and federal responses. Plenty of challenges existed prior to the COVID-19 pandemic; the pandemic was a tipping point for supply chain woes, said Jack Overstreet, senior manager in the cyber, intelligence and supply chain security division at the U.S. Chamber of Commerce.

The pandemic's resulting fiscal stimulus packages injected wealth into American homes, thereby increasing and shifting spending habits, causing further disruptions.

Businesses prepared for an anticipat-

ed slowdown and factory closures in Asia disrupted the flow of goods into the U.S. The pandemic also put three times the usual number of trucking companies out of business in 2020. Today, there's a shortage of 80,000 drivers and the U.S. workforce is 3.6 million below pre-pandemic levels. An estimated five to seven years' worth of e-commerce growth was compressed into a single year, which put further strain on the logistics and transportation industry, explained Overstreet.

Forty percent of seaborne imports to the U.S. arrive through the Ports of Los Angeles and Long Beach, which remain center stage for congestion. At peak, more than 100 container ships anchored off the coast waiting to offload. The number has since subsided, but remains "very problematic."

Overstreet predicts supply chain woes aren't through their worst.

COVID remains part of the equation, especially with China's zero-tolerance policy and locking down major ports. Some businesses are hoarding goods, which affects supply. West Coast ports are also negotiating contracts with unions, which Overstreet has heard "isn't going very well."

The government, however, is examining supply chain resilience through measures such as America's Supply Chain Executive Order, the U.S. Innovation and Competition Act and recent riders on the National Defense Authorization Act. It also appears as though the administration is exploring ways to rely less on the Chinese market, he said. Businesses, meanwhile, are shifting supply chains through regionalization, near-shoring and re-shoring. Overstreet warns, however, that these tactics take time, money and increase the risk of supply chain turmoil.■

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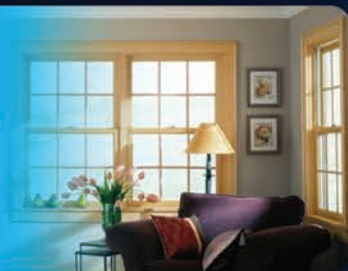
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Consistency After Acquisition

Risk management, certification and service are among factors to consider to ensure consistency across businesses



By Melanie Scherer

You may have noticed the window and door industry is experiencing a period of significant consolidation, driven by private equity and individual business decisions. We have seen evidence of this trend most recently with the acquisition of Cornerstone Building Products Inc. by private investment firm Clayton, Dubilier & Rice, one example of many over the past several years.

Following any acquisition, the desire for consistency across businesses involves more than simply harmonizing the differing cultures and business philosophies. There is also a need to establish consistency across business practices and strategies for the existing and acquired entities, starting with fundamental, practical considerations.

The desire for consistency across businesses involves more than simply harmonizing the differing cultures and business philosophies.

One essential component involves assessing the acquisition's impact on risk management. The affiliated companies must take early steps to identify the points of risk to ensure a cohesive response as issues inevitably arise. Wrapped up in this risk assessment are legal resolution strategies, insurance and financial decisions, and a general product defense philosophy requiring a critical evaluation across the entities and a strategic plan to bring the varying approaches together.

Certification is a factor that is relatively unique in this industry. While no window and door business is unfamiliar with the challenge of navigating standards and regulations, it is unlikely that newly combined companies fully align on how this is accomplished. Thorough attention must be given not only to how certification programs are implemented, but also generally to the role of certification as a business viewpoint. What level of importance is placed on participating in these programs? How is compliance documented and managed internally?

Service is another major consideration when joining different companies together. How are service requests and warranty claims managed? Which system is used for intake and completing service under the product warranties? And along those same lines, how is the applicable warranty interpreted and applied? When and by whom are exceptions to the warranty approved, if ever? These questions tie into all aspects of the strategic business decisions and should be addressed through working with the relevant departments as well as through the company leadership team.

Aligning the interconnected pieces of a business is a challenge all on its own, and bringing together previously stand-alone companies with the same goal presents an even greater challenge. However great, these and other important questions surrounding the business practices should be answered in order to set up the affiliated companies for even greater success once joined together. ■

Melanie Scherer is an attorney with The Gary Law Group, a law firm based in Portland, Oregon, that focuses on legal issues facing manufacturers of windows and doors. Contact her at 503/620-6615 or melanie@prgarylaw.com.



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By Laurie
Cowin



Weather Shield Windows & Doors exited production and sales of vinyl windows and doors to focus on its VUE Collection all-aluminum product and pursue growth in the high-end market.

Do More with Less

How offering fewer product lines can bring value to your business

In a moment where manufacturers cite high demand, it might seem counterintuitive to consider discontinuing product lines. Sometimes, however, doing just that is the key to expanding and adding value to a business.

For example, Weather Shield Windows & Doors in February announced its intent to exit production and sales of vinyl windows and doors, which includes eliminating its Visions brand of vinyl windows and doors, as part of a corporate initiative to focus on the luxury window and door market. “This decision is a natural next step in our strategy to position the business toward the premium segments of the market,” explained Robert Foote, president of Weather Shield Windows & Doors, in a statement. “Our new VUE Collection all-aluminum product, along with our wood clad product lines, represent the product portfolio best-suited to pursue the growing high-end of the market.”

Climate Solutions Windows & Doors also opted to discontinue some lower-volume products. Aron Perelman, VP marketing and sales, explains the

decision. “We discontinued all interior color options on our 9100 Classic series windows and only stock white vinyl. We’re still painting the exterior in any color but not stocking laminates on any 9100 products. This allows us to focus on our flagship 8100 series products with a full color line, maintaining adequate material for order fulfillment. The 8100 line is faster to manufacture, better U-factor and has a custom designed low-profile sloped sill (completely sealed, no weep holes). These changes help maintain our four- to six-week lead time.”

Zach Williams, host of Venveo’s Smarter Building Materials Marketing podcast, invited Jeremiah Hershberger, product manager for Key-Link Fencing & Railing, to discuss this topic during a podcast earlier this year, “Adapt or Die: How to Reevaluate your Building Materials Business Strategy.”

Define value

Companies strive to create more value for customers, but value is defined by the withholder, says Hershberger. Further, the definition of value can



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vary depending on where a company is in the supply channel. Key-Link considers the distributor, dealer and homeowner, but ultimately targets the installer when considering what value is. “If an installer doesn’t love to install it, he won’t request that product anymore,” he says. “That’s what our litmus of pass-fail is.”

Education and resource allocation is another part of the value a company can give its clientele. Hershberger notes his business development team educates down channel to ease transactions. “The process, as well as the product, brings value,” he says.

Data insights

Hershberger shares that Key-Link is discontinuing 44 percent of its product line this year and undergoing what he calls a “major overhaul” of its product lines. “There aren’t many easy conversations,” he says, “but the past two years have allowed us to sit down and look at the numbers behind it.” For example, the company has about 10 infill options, yet only three accounted for 96 percent of all sales. The remaining four percent were being ordered in job lot, meaning from customers who didn’t want stock and were shipping through a channel. “If our partners in the channel won’t stock it,” he queried, “how much of a demand is that product having in the marketplace?”

Hershberger encourages companies to gain insights into product line data, including what products are the top movers and what categories customers are demanding. Key-Link’s decision to discontinue products was born out of about a year of data analysis, he says.

He also notes today’s “unique environment” precipitated much of the decision to discontinue products. “We’ve had to consolidate resources as raw materials and supply chains are constrained and devote resources to top-moving product.”

Companies also must continually evolve. “We have some legacy SKUs that make us who we are today, but is it the right product for today’s environment?” Hershberger asks. He recommends examining SKU rationalization and why a company sells what it sells. “If we don’t change and adapt [to the current environment], we’re going to die,” he says.

Product marketing and life cycle is another area to examine. Hershberger notes the cycle of product launch, implementation, growth, maturity and then potential decline. The question is how

to move a product from the decline stage back to growth. He presents two options: tweak it and launch it back through, or discontinue it, take some time to reimagine it and relaunch it through the entire cycle. Key-Link is choosing the latter option for many of its discontinued products. “We know we need to market those products better and have a team that can market these down through the channel once we have the ability to relaunch those products,” he says.

Clear communications

Hershberger urges companies to consider internal and external communications around business decisions and announcements. The internal team should be aware of any changes and armed with information in advance of the customer being notified. Key-Link shares information through typed letters, email and on its website and social media.

Weather Shield shared the letter it sent to its customers from Todd Hallstrand, vice president of sales, explaining its decision to exit vinyl production. The letter cited increasing constraints from labor availability and supply chain disruptions, noting that “the time is right to focus our labor resources and capacity on the best business lines and products to ensure success in the future for Weather Shield.”

It continued, “The discontinuation of vinyl windows and doors will allow production employees to transition to clad production so that we can fully staff those lines for increased output. The market for wood window and door products remains exceptionally strong, and we already have adequate demand to support significantly expanded manufacturing capacity of these products.”

Weather Shield stopped accepting orders for its vinyl line in mid-May and expects winding down vinyl production will take several months as they work to fulfill the backlog of orders.

The letter concluded with an open door to sales representatives so that customers can adjust volumes as needed and examine other product lines for their needs.

Weather Shield, Climate Solutions and Key-Link are just some examples of companies consolidating and discontinuing products for the greater good of the company. “Change is tough, but if we don’t embrace that change, we’ll ultimately falter or fail,” says Hershberger. “We all need to continue to move forward to get where we’re going.” ■

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Capital Investments

The state of window manufacturing from an equipment supplier's perspective



By Emily Kay Thompson

ASSOCIATE
PUBLISHER

The Top Manufacturers Report in this issue (page 28) details the conundrum of the fenestration industry post-pandemic: orders are nonstop with no signs of slowing, while product, materials and labor are no match for the demand. Automation and technology are critical to the resolution. Window + Door asked Joseph Machine Company's David Kline, Vice President of sales and marketing and CEO Anthony Pigliacampo to address why it is crucial for manufacturers to continue to invest and how choosing the right partner makes all the difference in a successful transition.

WD: Let's dive right into the current state of the industry. What are you seeing from JMC's vantage point?

David Kline: Our industry is facing the same inflationary and labor pressures as everyone else.

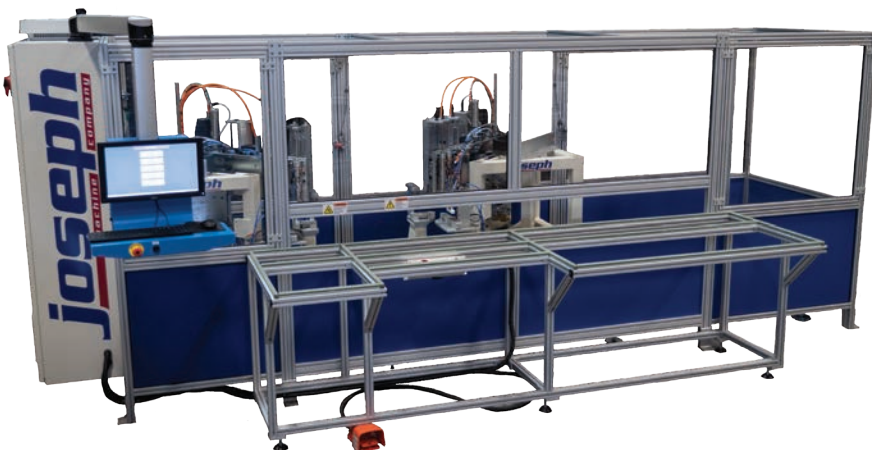
The good news is that demand is high; the bad news is fulfilling it is more challenging than ever. We believe automation is a solution to many of these issues. As wages rise and workers become harder to come by, automated solutions can allow manufacturers the ability to produce more with the same head count... and make the jobs easier so that the worker experience is improved, helping retention and satisfaction.

WD: Yes, labor is a big one. And, of course, supply chain. How is JMC navigating supply chain challenges?

Anthony Pigliacampo: The current supply chain challenges are unprecedented and unpredictable. We have worked to expand our supplier network and seek out alternative components so, when one is unavailable, we are not limited in our ability to produce machinery. Our experience in custom manufacturing has also helped us tremendously. We have a large engineering team that has been able to redesign various parts of machines around what we are able to source.

On our customers' end, supply chain certainly impacts lead times, but not nearly as much as high demand. There is a tremendous need in our industry for automated solutions right now and that is driving lead times more than anything else. It's paramount to be more proactive in budgeting and planning.

WD: Yes, and, in the same vein, we hear manufacturers struggle to take a production



Fixtures on Joseph Machine's welders are mechanically rigid to ensure consistency on multiple welds.

time-out to focus on integrating new systems and equipment. What do you have to say about this time factor?

AP: What we see is that new solutions tend to integrate into operations easily and pay for themselves relatively quickly. Where time becomes important is planning for future needs. Customers often come to us with an immediate need for a solution. And, with customized capital equipment, machines and parts are not just sitting on a shelf. Manufacturers need to allow appropriate time for their suppliers to produce machines in relation to when they need them to be put into service.

WD: Point taken. Now, let's shift to talk more about specific equipment. What's trending in automated equipment?

DK: Every manufacturer has specific bottlenecks in their production; we offer solutions for maximizing output accordingly. There is no single solution. JMC has a deep engineering team that engages with customers to understand exactly what they need and help them craft solutions to meet those goals.

We are also able to offer an advanced automated manufacturing line from 'stick to opening.' A line built with Joseph fab centers, welders and cleaners offers the highest throughput, safest worker environment and best ROI of any solution in the market.

But also consider that, in modern manufacturing, capital equipment is really a software system that drives a mechanical system. We spent years developing a new .NET software platform to power all JMC equipment. This architecture will enable equipment to stay up to date much easier than in the past, with remote upgrade capabilities and a seamless way to roll out new features to customers. Our system not only works across equipment, but offers simple, easy-to-use menus and screens to train operators more easily. It also has a flexible back end that can connect to all data sources present in a modern factory.

WD: What about the universal problems most manufacturers contend with? What are the issues and what solutions exist?

DK: In a word, consistency. Our welder fixtures are the most mechanically rigid in the industry, which ensures every weld is identical when welding multiple frames and sashes at the

same time. Our controls and software can be seamlessly tied to our fabrication equipment, allowing for a consistent user interface across a production line along with easy industry 2.0 data collection. And, our 24/7/365 service with remote diagnostic capability ensures our welders and cleaners will have the highest uptime of any equipment in the category.

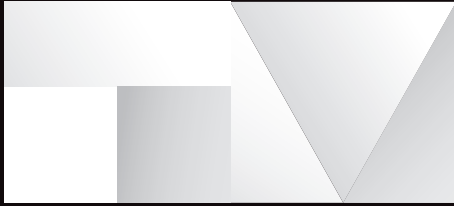
WD: Consistency—we could all use more of that, especially after years of uncertainty. Another lesson we've come away with during such unprecedented times is how important relationships are across the board. Talk about why the supplier/manufacturer relationship is so important.

AP: Buying capital equipment is not a transaction; it is a marriage. We recently took in the 18th machine we ever produced to refit some tooling on it. This machine was delivered in the 1980s! You have to trust that whomever you purchase equipment from is going to be there 30 years from now. Manufacturers need to be able to trust that their vendor has a willing and capable team that is ready to help should the need arise. We believe selling the equipment is just the starting point and we pride ourselves on providing the best support possible over the lifecycle of our equipment.

WD: One last thing: tell us the secret to how JMC has thrived in this industry for, what, 35-plus years?

AP: Yes, more than 35 years. JMC is a values-led, family-owned company that is committed to helping American manufacturing thrive. The team is committed to doing everything we can to not just deliver great equipment, but keep it working properly for as long as it is in service. Ours is a culture that is obsessed with the success of both our customers and our team members. This is incredibly important—we are always focused on innovating and improving our products and everyone that works here loves that continual growth mindset. ■





GREATEST OPPORTUNITIES FOR THE YEAR AHEAD

- INTERNET SALES
- REMODELING
- GEOGRAPHIC EXPANSION
- TECHNOLOGY AND AUTOMATION
- PRODUCT GROWTH
- REDUCED LEAD TIMES
- LARGE PROJECTS
- ENERGY EFFICIENCY

Source: 2022 Window + Door Top Manufacturers Survey



Photo courtesy of Van Isle Windows



The Top Manufacturers Report

BY LAURIE
COWIN

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The Big Picture

NEW HOME CONSTRUCTION,
REMODELING AND
MANUFACTURING OUTLOOKS

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A Look at Residential Fenestration

MARKET CONDITIONS, LABOR AND
AUTOMATION, MATERIALS, SUPPLY
CHAIN AND PRODUCTS

44

The Top Manufacturers List

NORTH AMERICA'S LARGEST
MANUFACTURERS OF RESIDENTIAL
WINDOWS, DOORS, SKYLIGHTS AND
RELATED PRODUCTS, BASED ON
SALES VOLUME

H

Headlines and reports from the past year have made it easy to focus on the challenges in the overall economy and hardships in the construction products market specifically. From worsening supply chain complications to rapidly rising inflation to fallout from the ongoing

Ukraine-Russia war, many factors have negatively impacted the market. Within those hardships, however, lies plenty of opportunity for manufacturers to expand business and continue to innovate.

As the 2022 Industry Pulse, published in the January-February issue of Window + Door, said, this is the year when companies are finally starting to work on their businesses again, rather than just in their businesses. Labor, costs, materials and supply chain might be hard, but rather than merely “getting by,” many companies are navigating these challenges while actively growing and best meeting their customers’ evolving needs. Window + Door’s Top Manufacturers Report, presented in the coming pages, supports this sentiment.

This year’s report examines the market, pain points and product trends with commentary from manufacturers about how they are expanding in today’s conditions while mitigating challenges.



PART 01

The Big Picture

DESPITE OPERATING IN A NICHE MARKET, IT'S IMPORTANT THAT RESIDENTIAL FENESTRATION MANUFACTURERS TAKE STOCK OF THE BUILDING MARKET AS A WHOLE TO BEST UNDERSTAND WHERE WINDOW AND DOOR PRODUCTS FIT IN AND WHAT OVERALL BUILDING TRENDS ARE AFFECTING THE MARKET.



New Home Construction

Sales of newly built single-family homes in March fell 8.6 percent to a 763,000 seasonally adjusted rate from an upwardly revised reading in February, according to the U.S. Department of Housing and Urban Development and the U.S. Census Bureau. New home sales are down 12.6 percent

compared to March 2021.

"Buyers are facing sticker shock due to deteriorating affordability conditions and a lack of existing home inventory," says Danushka Nanayakkara-Skillington, NAHB assistant vice president of forecasting and analysis. "Only 14 percent of new home sales in March were priced below \$300,000. A year ago, it was 34 percent." The median sales price rose to \$436,700 in March from

\$421,600 in February and is up more than 21 percent compared to a year ago, due primarily to higher development costs.

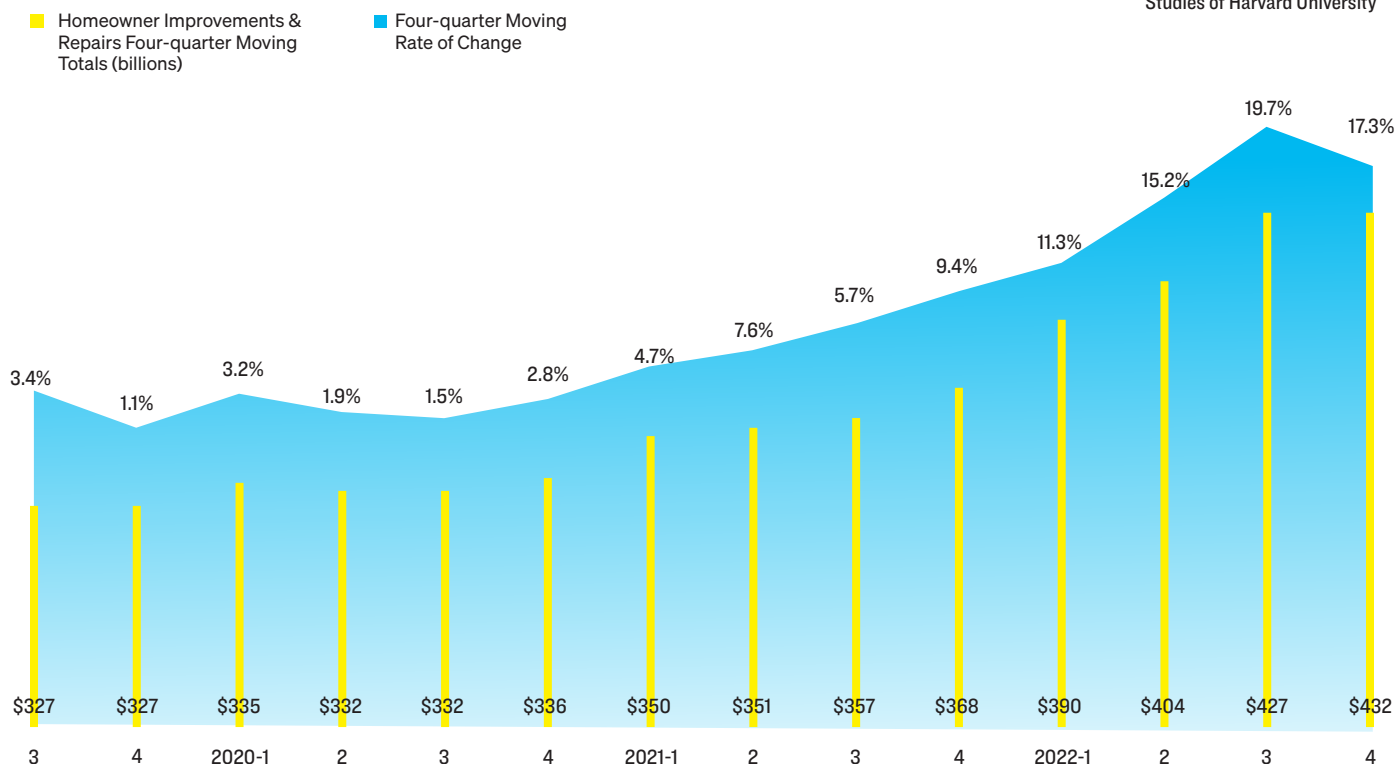
Those higher costs, which include rising interest rates and higher construction costs, continue to deteriorate builder confidence and housing affordability. Builder confidence in the market for newly built, single-family homes declined in April for the fourth consecutive

month, according to the National Association of Home Builders/Wells Fargo Housing Market Index.

"Despite low existing inventory, builders report sales traffic and current sales conditions have declined to their lowest points since last summer as a sharp jump in mortgage rates and persistent supply chain disruptions continue to unsettle the housing market," says Jerry Konter, NAHB chairman.

Leading Indicator of Remodeling Activity - Fourth Quarter 2021

Source: Joint Center for Housing Studies of Harvard University



“The housing market faces an inflection point as an unexpectedly quick rise in interest rates, rising home prices and escalating material costs have significantly decreased housing affordability conditions, particularly in the crucial entry-level market,” says Robert Dietz, NAHB chief economist.

Mortgage interest rates have jumped more than 1.9 percentage points since the start of the year and currently

stand at 5 percent, the highest level in more than a decade.

Remodeling

Spending for home improvements and repairs is expected to expand at a stronger pace in 2022, but signs point to some easing of growth by year end, according to the latest Leading Indicator of Remodeling Activity

from the Joint Center for Housing Studies of Harvard University. The LIRA projects double-digit gains in annual homeowner renovation and maintenance expenditure will top out in the third quarter of 2022 before beginning a deceleration toward more sustainable rates of growth.

While annual owner improvement and repair spending could reach \$430 billion by the second half of 2022, several headwinds

may still temper growth expectations this year, including rising costs of labor and construction materials, difficulty retaining contractors and climbing interest rates.

Strong remodeling conditions continue to boost remodeler confidence, according to the first quarter National Association of Home Builders/Westlake Royal Remodeling Market Index.

“Business remains strong



for most remodelers at the beginning of 2022,” says Kurt Clason, NAHB Remodelers chair. “However, a few are starting to report that customers are reluctant to move forward on projects due to the delays and higher costs caused by supply chain problems.”

The most recent RMI score of 86 indicates “positive remodeler sentiment and is consistent with NAHB’s projection of moderate growth in the remodeling market for 2022,” says Dietz.

Manufacturing

Nearly 89 percent of the overall manufacturing industry is positive about their companies’ outlook, according to the National Association of Manufacturers’ Outlook Survey for the First Quarter of 2022.

A further breakdown of survey findings revealed:

- Expected growth rate for sales over next 12 months: 6.1 percent
- Expected growth rate for full-time employment over next 12 months: 3.7 percent
- Expected growth rate for production over next 12 months: 5.6 percent
- Expected growth rate for prices of company’s products over next 12 months: 6.1 percent (record high)
- Expected growth rate for inventories over next 12 months: 2.4 percent
- Expected growth rate for raw material prices



Photo courtesy of Cornerstone Building Brands

and other input costs over next 12 months: 7.1 percent

Labor concerns in manufacturing will remain a concern for the rest of the decade. According to a study by Deloitte and The Manufacturing Institute, 2.1 million manufacturing jobs could go unfilled by 2030, which could cost \$1 trillion in 2030 alone. An estimated 1.4 million manufacturing jobs were lost during the early days of the COVID-19 pandemic, setting the industry back by more than a decade. Executives report trouble filling higher-paying entry-level production positions, let alone finding and retaining skilled workers for specialized roles.

DEI initiatives can exert a growing influence on workforce trends, according to the report. “Attracting and retaining diverse talent presents both a challenge and solution to bridging the talent gap. To attract a new generation of workers, the industry should work together to change the perception of work in manufacturing and expand and diversify its talent pipeline,” says Paul Wellener, Deloitte vice chairman and U.S. industrial products and construction leader.

Price Increases

Nearly all (93 percent) of professional contractors reported increased material

costs in the past six months, with an average hike of 19 percent, according to research from the Home Improvement Research Institute.

Here’s how contractors responded:

- 55 percent raised prices and absorbed increases
- 16 percent absorbed all price increases
- 29 percent passed all price increases to customers
- 57 percent lost bids due to price increases

The majority of pros expect prices will be even higher in six months, but the current high demand for contractors also means they aren’t yet concerned about losing jobs.

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PART 02

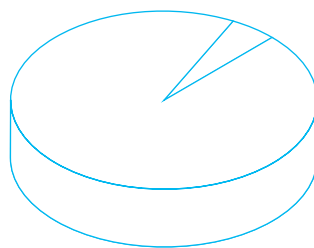
A Look at Residential Fenestration

THE WINDOW + DOOR TOP MANUFACTURERS SURVEY, CONDUCTED IN LATE MARCH AND EARLY APRIL 2022, TOOK STOCK OF RESIDENTIAL FENESTRATION MANUFACTURERS OF ALL SIZES ACROSS NORTH AMERICA. NEARLY ALL RESPONDENTS CITED INCREASED DEMAND AND SALES, AND MOST EXPECT THAT TREND TO CONTINUE EVEN AS PRESSURE RELATED TO MATERIALS, LABOR AND SUPPLY CHALLENGES INCREASES.

Source for all charts unless otherwise noted: 2022 Top Manufacturers Survey

Market Conditions

Unpredictability in material availability; rising material costs, often with little to no notice; long lead times and labor continue to plague most companies and cause many to rethink how to manage their businesses. "Rising material costs make it difficult to meet consumers' needs," said one, while another noted the "choke-hold on production" supply chain issues caused. "The projects are still coming in, but the challenges to get materials, produce and deliver are still prevalent, meaning at some point capacity will hit a ceiling."



95%

of companies experienced measurable, significant growth over the past five years.

GROWTH METHODS:

Hired employees: 84%



Gained market share: 79%



Expanded product lines: 73%



Expanded geographic sales areas: 50%



Acquired other companies: 18%



Other: 9%



*Other includes organic growth, increased production and new product launches

CASE STUDY

AVANTI WINDOWS & DOORS SEIZES SUCCESS

The Arizona-based window and door manufacturer has achieved astounding growth in recent years through its unique business model, customer dedication, and building quality products with help from Quanex.

How does a window and door company achieve tremendous growth in a challenging business climate? Ask Arizona's Avanti Windows & Doors, and they'll tell you it's a dedication to a unique business model and always delivering quality to its customers.

"We specialize in window and door products and installation for the nation's leading big builders," says Dustin Petty, president, Avanti Windows & Doors. "Our customers are looking for trade partners to help them build better homes in less time—and that's what we help them do. We only sell what we manufacture—high-quality window and door systems. And for everything we sell, we provide installation services, following a strict quality control process to ensure long-term performance for our customers and homeowners."

Avanti began manufacturing window and door systems in 2014. From the beginning, Avanti worked with Quanex to source warm-edge spacer systems to deliver high-performing insulating glass (IG) that Petty knows his customers are seeking. Built with either Duralite® or Super Spacer® systems depending on the product line, Avanti has consistently delivered quality window and door systems across an explosive growth trajectory.

Growing with the Market

Part of Avanti's mission is to help homebuilders complete new homes quickly and profitably to keep up with consumer demand. "Our focus, day in and day out, is to build quality homes and do it in less time," said Petty. "The challenge is scaling our business to support the rapid growth of our customers."

And throughout the Southwest where Avanti does most of its business, demand is particularly high for large-format windows and sliding doors. In the warm climate, many homeowners want to welcome in the weather as much as their homes will allow them to do so.

"Large-format patio door configurations, where we use Super Spacer to fabricate the insulating glass, have become our bread and butter," Petty adds. "And that's some of the most complex IG to make. It's big, heavy and hard to handle. It has to be perfect when it's being installed in someone's new home."

For these reasons, Avanti has invested in high-speed automated equipment to reliably fabricate large-format and other IG with Super Spacer and Duralite technologies. "We have a dedicated line that produces patio door IG all day long. It has run almost continuously every day for the past six years, and it's a huge part of how we've been able to deliver on higher demand and grow our business."

To further support this area of the business, Avanti also works with Quanex to source screen door solutions for a variety of its patio door systems. Petty notes that the high-quality screen doors, which they purchase in a variety of configurations, have helped Avanti further differentiate itself from the competition.

Continuous Collaboration

Like any window and door manufacturer, Avanti is keenly aware of how difficult sourcing and supply of raw materials have been throughout the past couple years.

"You can't build windows without glass and spacer," Petty says. "And continuity of supply has been a challenge for everyone in the industry. We've worked closely with Tony Thiret [Quanex territory sales manager] to make sure we have what we need. He's done a great job truly being our advocate—he works hard to understand the growth trajectory that we're on and what we need to continue our success. Quanex has provided a tremendous level of service and transparency. Relationships like this one are critical for this moment in the industry and where we're headed."

Learn more about our solutions at www.Quanex.com.



ENDURING RELATIONSHIPS FOR ENDURING PRODUCTS

CASE STUDY: WIN-DOR® AND QUANEX WORK TOGETHER TO BRING VALUE

Photo Credit: windorsystems.com

Back in the 1990s, Southern California-based Win-Dor® Quality Windows and Door Systems found their niche building large-format bifold doors for “California Rooms” that merge indoor and outdoor spaces. These covered patio rooms created the illusion of space in areas where lots were smaller, and houses were bigger.

That trend toward indoor-outdoor living has only grown and spread across the U.S, particularly in the South. Likewise, Win-Dor has extended its footprint over the years, offering its high-quality windows and doors to homeowners through a nationwide network of retailers.

“Now, more than ever, people want to extend their living spaces into the outdoors, and more and more builders have adopted the concept into the design of their homes,” said David May, general manager, Win-Dor. “This was really our first step into the big specialty market that has fueled our growth over the years.”

While Win-Dor became known for large-format doors, the company offers a wide range of standard-sized and customized sliding doors, swing doors and folding windows that are on trend with consumer design preferences.

An Ally in Quality and Growth

As Win-Dor was looking to grow its business, they made the decision to make the switch to Super Spacer® in 1998—and they never looked back.

According to May, switching to Super Spacer was the easy way to make better insulating glass (IG). They

“Prior to working with Quanex, we knew we needed to differentiate our products in terms of quality, efficiency and lead times,” May said. “We wanted to bring more value to our market, and that’s what led us to explore Super Spacer.”

David May, General Manager, Win-Dor

were using aluminum spacers prior and always counted on a certain number of failures. But all that changed.

“The failure rate went from what we considered acceptable down to practically zero,” he said. “We were also able to improve energy efficiency and provide better lead times, creating an excellent experience overall for our customers.”

And as the years passed, the Win-Dor and Quanex relationship only grew stronger as the company added automated Erdman Super Spacer lines that would further improve quality and production efficiency.

May considers it their biggest success story when it comes to automation. “The process was smooth, worked well and enabled us to solve any problems in-house. It gave us much more control over production. We know with certainty the number of IG units we can produce in a shift and what we can get off the line. The consistent volume has been a game changer for our business.”

Almost a Quarter Century of Success

After 24-plus years of working with Quanex, May takes comfort in knowing he has people he can reach out to for help—but he doesn’t need it very often. Because of the quality of Super Spacer and decades of collaboration, when the Quanex technical services team visits, they don’t find much in their audits.

“Working with the Quanex technical services team has been a positive experience,” May said. “Even when they do find things, it’s usually small, and they make good recommendations on how to resolve any issues. We might not need to call very often, but when we do, the Quanex team is always readily available.”

Enduring products start with enduring relationships—and that’s how Win-Dor and Quanex have grown together over the years.

AHEAD OF THE CURVE:

MIKRON® FACILITIES HARNESS THE POWER OF “WHY?”



Keeping up with the demand in today's business environment requires a new kind of decision-making. So often decisions are made based on what's good for today. But the best decisions are not often the easiest ones because it requires companies to dig deep, explore root causes and find sustainable solutions to daily problems.

That's exactly what the Mikron team did leading up to the installation of new state-of-the-art equipment in 2019. What started as an initiative to keep up with market demands and reduce scrap ended up having far-reaching benefits, including improved morale, shortened lead times, energy savings, increased scrap recycling and many process improvements.

“We found that attending to the core issue involved shifting our collective frame of mind,” said Larry Robinson, vice president, Operations for Window and Door Profiles. “We went from asking what needs to be fixed temporarily to constantly asking how we can make things better.”

It was a shift in attitude for everyone in the organization. The team shifted from reacting to orders as they happened to planning ahead—and that planning involves sales, purchasing and production that forecast demand and proactively source raw materials to get product in the hands of customers faster.

“As of early 2022, our on-time delivery has improved to around

98% even among widespread global supply chain problems,” Robinson said. “We are a work in progress, but we are learning what it takes to succeed in today's environment, and our customers appreciate the commitment to delivering on their needs.”

The commitment, the investment and the change in mindset have put Quanex in a position to stay ahead of curve when it comes to supplying consistent, high-quality vinyl window and door profiles. But the shift has also had a significant impact on sustainability efforts. Mikron now recycles more than 90% of scrap generated, and the new equipment has generated energy savings of nearly 1,500,000 kilowatt hours annually—that's as much as used in nearly 1,400 homes.

The biggest lesson learned? Robinson said it is to always ask “Why?” and to focus on continuous improvement that will have lasting benefits. It's how companies go from “the way that it's always been done” to “the way that is best for our future.”

Quanex Hits the Road!


We're excited to see our customers face-to-face once again this year at some of the fenestration industry's biggest tradeshow. It's where we make and strengthen the quality connections with our customers that drive our mutual success.

Where will we be this year? Find us at:

- GlassBuild America, October 18-20 in Las Vegas | Booth 7026
- WinDoor, November 9-10 in Montreal

At each show, we'll be showcasing our latest innovations that fenestration professionals can count on. From warm-edge spacer solutions to groundbreakingly efficient window and door framing systems, we can show you how to seize the future in our ever-changing industry.





AT QUANEX, WE'RE A PART
OF SOMETHING BIGGER

OUR BRAND EVOLUTION

Contributing to the success of our customers while helping them make a positive impact on the world has always been a driving motivator for Quanex. And today, that mission is more important to us than ever before.

It's why this year, we've launched A Part of Something Bigger—an evolution of the Quanex brand that you trust, with a greater emphasis on all that we do and the people who do it every day.

What it Means

At Quanex, we are **A Part of Something Bigger** by:

- Improving the performance and aesthetics of end products through continuous innovation
- Helping customers achieve greater production efficiencies
- Giving back to communities where we operate
- Enhancing shareholder value
- Helping our employees learn, grow and thrive

As industry-leading experts, we partner with our customers to offer solutions and services that help their products and business stand out. Our solutions and processes are found in a wide range of industries and applications, including windows, doors, kitchens, offices, global landmarks, on transportation, refrigeration, solar panels—and much more.

We're excited to carry out our new brand mission in everything that we do—for you, our customers and the world.



Quanex Team Members L to R: Nick Bell, IT; Jenny Hornyak, Accounting; Sheryl Montan, Business Compliance; Ron Pich, Engineering

Why We're Doing It

Quanex was founded as Michigan Seamless Tube Company in 1927. The original focus was on producing tubing made from steel alloys. It wasn't until 1977 that the company became Quanex, moving its headquarters to Texas. Today, Quanex has over 3,800 employees at more than 30 locations around the world. Our products and technologies can be found in 90 countries.

While we are everywhere, people may not see all we do. Quanex was born from a series of acquisitions over the course of our history—each with their own culture and way of doing things. Each and every legacy company is valued for their history and innovation. We're now more connected than ever.

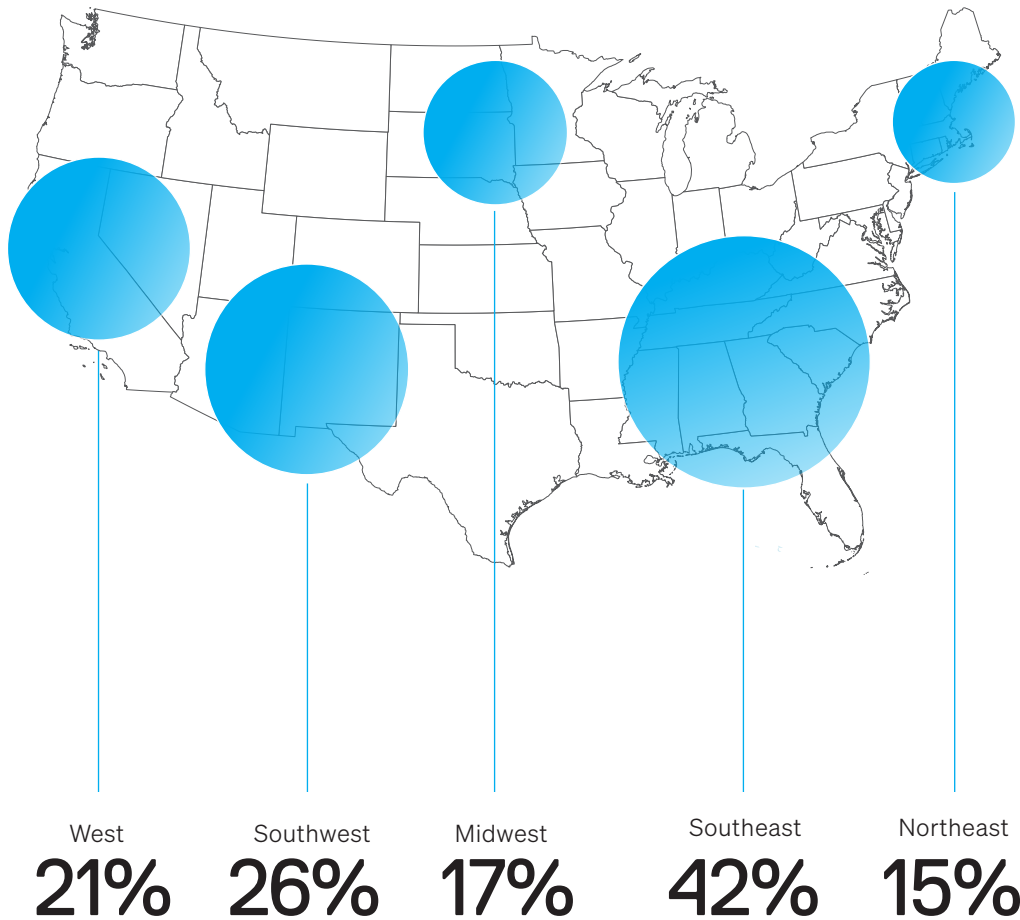
A Part of Something Bigger ties together our legacy, our scope and our heritage. It reflects how we're positively impacting customers one idea, one component and one person at a time. It's who we are and drives us to continue pursuing ongoing innovation for the most demanding applications of our customers around the world.

Scan the code to see how Quanex is A Part of Something Bigger.



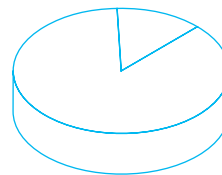
YOUR INDUSTRY INSIGHT

To receive Fenestration Focus via email, please visit
quanex.com/register.

**In which geographic markets did you see the most growth in 2021?**

The seeming permanence of working from home and strong housing and remodeling demands were among the most-cited reasons companies gave for increased demand. One Florida-based manufacturer said, "The 'work from home' mentality is driving new construction and remodeling not only in Florida, but across the country. People are spending more time in their homes and therefore wanting to invest more in them."

The work from home trend also allows families to relocate without sacrificing existing jobs. "The residential construction market is growing due to housing shortages in most major markets," says another manufacturer. "The pandemic also had an impact on housing, sparking many individuals and families to move into new homes or relocate to new areas due to more prevalent remote work opportunities."

**87%**

had higher gross sales in 2021 compared to 2020, while 11% remained about the same.

Where will you invest in your business in 2022?

Employee recruiting and retention: 84%

Equipment updates: 82%

Software updates: 55%

Introduce new products: 55%

R&D/testing: 43%

Marketing: 41%

Expand locations: 27%

Other: 7%

What will be major headwinds in 2022?

Material cost: 78%

Inflation: 76%

Labor shortage: 64%

Material availability: 64%

Logistics: 42%

Backlogs: 29%

Evolving product designs: 9%

Policy: 7%

Coronavirus restrictions: 7%

Tariffs: 4%

Other: 4%



Labor and Automation

Several manufacturers noted how many come from outside the industry and have little to no relevant manufacturing experience. Training is also difficult, especially when demand is so high. "Training requires the attention of a supervisor or other worker to train the new employee. Being busy makes that difficult to do without impacting current production rates," said one manufacturer. Many manufacturers also commented that retention is a problem, with many people leaving quickly, further constraining the ability to properly train.

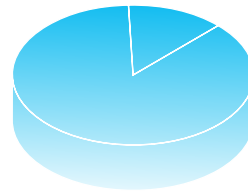
Several manufacturers said added overtime and flexible shifts have helped ease labor challenges. One noted, however, to be careful with overtime because of the potential of reduced job satisfaction and even greater retention difficulties.

Materials and Supply Chain

Supply chain remains a widespread concern across all industries. Survey respondents offered some of their best practices for keeping upstream and downstream supply chains operating.

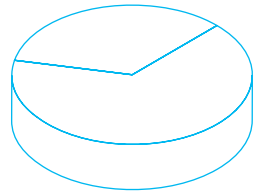
- Ordering earlier
- Increasing inventory levels
- Managing customer expectations
- Being flexible
- Multi-source
- Consistent communication with suppliers and customers

Clear customer communication and transparent, efficient operations are especially critical during a time of price volatility and increases. "We have looked for ways to operate more efficiently to allow for us to absorb price increases from our suppliers, rather than forward them onto our customers," said one respondent. "We are also picking up on additional market share from competitors."



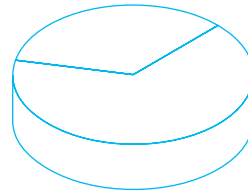
84%

employ automation at their factory.



66%

of respondents source materials internationally.



66%

plan to add automation in the coming year.

Are you considering looking for domestic suppliers?

- Yes: 63%
- No: 21%
- Undecided: 16%



What are the biggest benefits?

Increased output: 68%

Increased quality: 65%

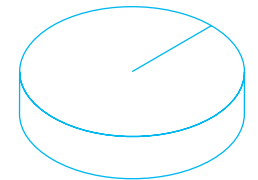
Labor savings: 59%

Cost savings: 35%

Operational transparency: 32%

Other: 11%

*Other includes reduced waste and easier training

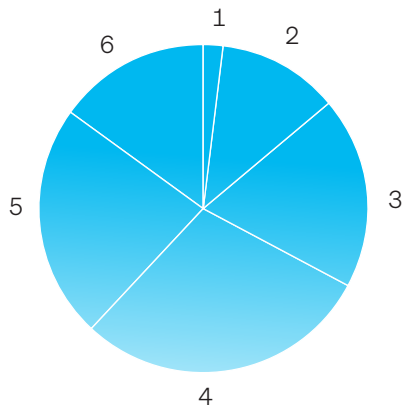


100%

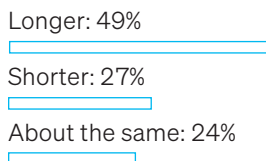
of respondents indicated their material prices increased in the past year with an average increase of 29%.

How deep is your backlog?

1. 1-2 weeks: 2%
2. 2-4 weeks: 12%
3. 4-8 weeks: 19%
4. 8-12 weeks: 29%
5. 12-16 weeks: 23%
6. Longer: 15%



How does this compare to last year?



What is your biggest labor challenge?

- Recruitment: 46%
- Retaining: 45%
- Training: 42%
- Other: 23%



79% of respondents had more difficulty finding workers in 2021 compared to 2020.

70%

of respondents made changes to their supplier partners in the past year.

Many companies added suppliers for products they already use, primarily out of necessity because of lack of availability with existing suppliers and so they can reduce long lead times and ensure material availability. One survey respondent said multi-sourcing “allows us to stay competitive with both price and lead time.”

74%

have strategic alliances with their suppliers.

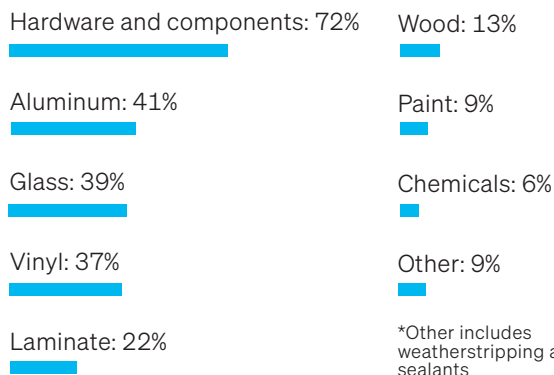
Strategic alliances have given some manufacturers increased assurance of timely shipments and volume and help with consistent, open lines of communication. “Establishing healthy partnerships and relationships are extremely important in our industry,” wrote one survey respondent. “Unlike in a down market, suppliers today have a nearly unlimited choice with which customers to service so the biggest benefits of having alliances, partnerships, etc., is that it enables higher levels of service and open/honest dialogue when challenges occur.”

70%

of companies have been on allocation.

Window and door manufacturers are tackling this challenge by submitting blanket orders, sourcing from other suppliers, making product changes when possible and sometimes just waiting for the supplies.

What materials are most challenging to source?



*Other includes weatherstripping and sealants



Products

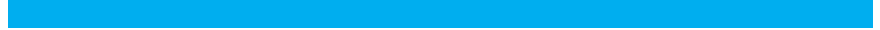
About 70 percent of survey respondents manufacture vinyl windows and/or doors, again making vinyl the most ubiquitous material worked with, but manufacturers of all materials and product types, including wood, aluminum, fiberglass and more, share the common goal of manufacturing products to meet customers' needs and market demand.

What product features are your customers asking for?

Customized products (includes color, hardware, options, finishes): 84%



Energy-efficient products: 82%



Larger windows/doors: 76%



Impact-rated products: 42%



Sound abatement: 38%



Historically accurate products: 24%

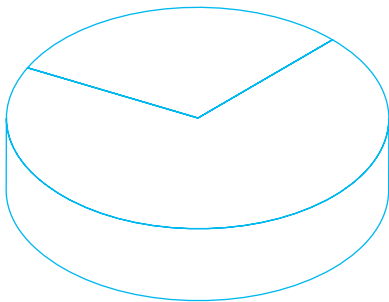


Other: 6%



73%

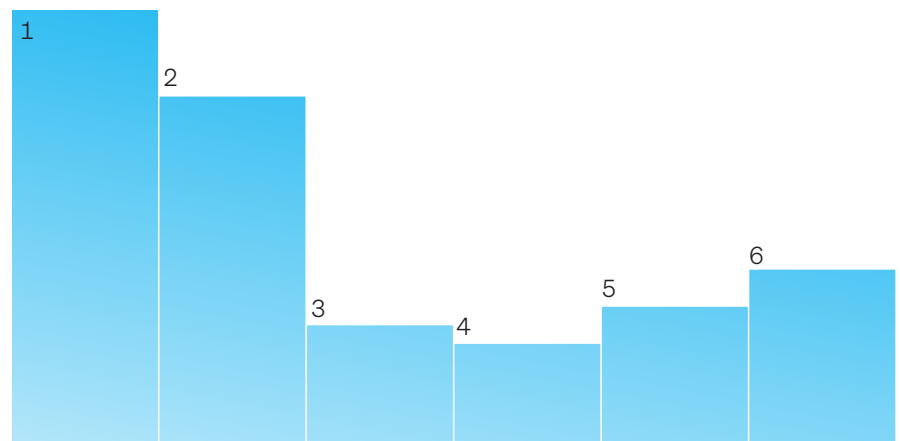
plan to update products as necessary to meet the new Energy Star 7.0 guidelines.



How so?

1. Triple-pane: 71%
2. Gas fill: 57%
3. Skinny triples: 20%
4. Dynamic glass: 17%
5. Thermally broken aluminum: 23%
6. Other: 29%

*Other includes spacers, foam fill, glass coatings and a larger IG pocket



Fenestration and Glazing Industry Alliance 2021/2022 Study of the U.S. Market for Windows, Doors and Skylights

Forecasts are based on projections of construction activity as of April 2022.

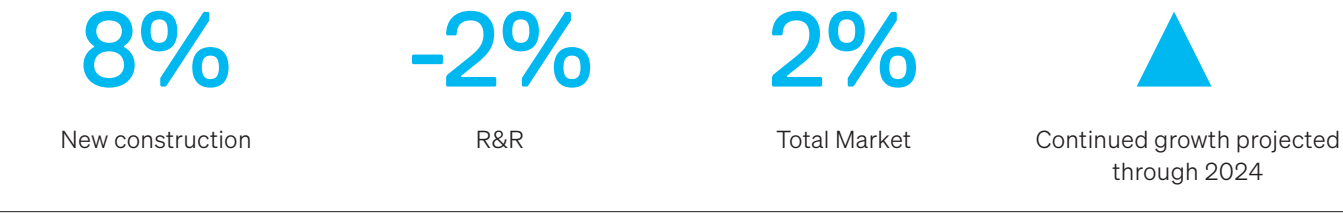
Prime Window Growth



Remodeling and Replacement Window Growth



Entry Door Growth



Residential skylight growth

6% increase in shipments in 2021



The Top Manufacturers List

THE TOP MANUFACTURERS LIST DETAILS NORTH AMERICA'S LARGEST MANUFACTURERS OF RESIDENTIAL WINDOWS, DOORS, SKYLIGHTS AND RELATED PRODUCTS, BASED ON SALES VOLUME

*Sales are estimated based on research; figures not provided by company

More than \$1 Billion

Andersen Windows & Doors

BAYPORT, MINN.
ANDERSENWINDOWS.COM
800/426-4261

Product Lines: Wood, composite, vinyl-clad wood windows, aluminum and fiberglass windows, entry doors, and patio doors sold under the Andersen Windows and Doors, Renewal by Andersen, Heritage, MQ and Weiland brand names

Brands include Renewal by Andersen

Cornerstone Building Brands

CARY, N.C.
CORNERSTONEBUILDINGBRANDS.COM
888/624-8677

Product Lines: 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

Brands include 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

Jeld-Wen

CHARLOTTE, N.C.
JELD-WEN.COM
800/535-3936

Product Lines: Aluminum patio, sliding and swing doors, and windows; aluminum-clad doors

and windows; architectural windows; barn doors; bi-fold doors and windows; composite patio doors and windows; entry doors; fiberglass entry doors, patio doors and swing patio doors; fire-rated doors; flush-glazed door panels; glass exterior and interior doors; hybrid aluminum/vinyl doors and windows; impact-resistant doors; impact-resistant vinyl patio doors and windows; insulating glass units; interior doors; multi-panel doors; multi-slide pocketing doors; patio doors; pivot doors; prehung doors; sliding doors; steel doors; tilt-and-turn windows; vinyl casement patio doors and windows, multi-panel patio doors, patio doors, replacement windows, sliding doors, swing doors and windows; vinyl-clad patio doors and windows; wood entry doors, interior doors, patio doors and windows; and wood-clad doors and windows

Brands include Aneeta Window Systems, Corinthian, Dana, Dooria, Karona, LaCantina, MMI, Stegbar, Swedor, and VPI Quality Windows

Marvin Windows and Doors*

WARROAD, MINN.
MARVIN.COM
888/537-7828

Product Lines: Aluminum and fiberglass doors, wood and aluminum-clad windows and doors, fiberglass windows and doors, interior doors, impact-resistant windows and doors, impact-resistant garage doors, fiberglass skylights and smart skylights, aluminum and fiberglass Sky-cove units

Subsidiaries include Infinity from Marvin Replacement Windows, TruStile Doors, Tecton Products and SIW Windows & Doors

Masonite

TAMPA, FLA.
MASONITE.COM
800/895-2723

Product Lines: Barn doors; bi-fold doors; composite entry doors; door glass; entry doors; fiberglass entry doors, patio doors and swing patio doors;

manufacturers



Photo courtesy
of Cornerstone
Building Brands



fire-rated doors; flush-glazed door panels; impact-resistant doors; injection-molded frames; insulating glass units; interior doors; prehung doors; steel doors; and wood entry doors, interior doors and patio doors

Subsidiaries include USA Wood Door, Premdor, National Hickman, Door-Stop International, Solidor, Residor, Nicedor, BWI Distribution, Louisiana Millwork and Florida Made Door

MITER Brands

GRATZ, PA.
MIWINDOWS.COM
717/365-3300

Product Lines: Aluminum patio doors and windows; fiberglass patio doors and windows; and vinyl sliding doors and windows

Subsidiaries include MI Windows and Doors, Milgard Windows & Doors and Sunrise Windows & Doors

Pella Corp.*

PELLA, IOWA
PELLA.COM
877/473-5527

Product Lines: Wood windows and patio doors, vinyl windows and patio doors, fiberglass windows and patio doors, wood entry doors, multi-slide doors, pivot doors

Subsidiaries include Duratherm Windows, Custom Window Solutions, Avanti Inc., Avanti Install California, Bonelli, Bonelli Southwest and Reilly Windows

PGT Innovations

NORTH VENICE, FLA.
PGTINNOVATIONS.COM
941/480-1600

Product Lines: Aluminum entry and patio doors, porch enclo-

tures, sliding doors, swing doors and windows; architectural windows; bi-fold doors; door glass; entry doors; glass exterior doors; impact-resistant aluminum doors and windows; impact-resistant vinyl patio doors and windows; insulating glass units; multi-panel doors; multi-slide pocketing doors; patio doors; pivot doors; porch and patio enclosure; sliding doors; vinyl casement windows, multi-panel patio doors, patio doors, replacement doors and windows, sliding doors, swing doors and windows; and window wall

Subsidiaries include CGI, PGT Custom Windows and Doors, WinDoor, Western Window Systems, Eze-Breeze, CGI Commercial, NewSouth Window Solutions, Eco Window Systems, Anlin Windows & Doors

Velux USA*

GREENWOOD, S.C.
VELUXUSA.COM
803/396-5700

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

\$500 Million to \$1 Billion

KÖMMERLING USA*

HUNTSVILLE, ALA.
KOMMERLING.US
800/330-2239

Product Lines: Lift-and-slide patio doors, tilt-and-turn windows, balcony doors, residential doors, large fixed lights

KÖMMERLING is a profine Group company

Starline Windows*

SURREY, BRITISH COLUMBIA, CANADA
STARLINEWINDOWS.COM
604/882-5100

Product Lines: 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; and entry doors

Subsidiaries include Starline Installations Ltd.

Therma-Tru Doors*

MAUMEE, OHIO
THERMATRU.COM
800/843-7628

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

Subsidiaries and sister companies include Moen, Perrin & Rowe, Riobel, ROHL, Shaws Victoria Albert, LARSON, Fiberon, Fypon, Master Lock, American Lock SentrySafe, and Master-Brand Cabinets

Therma-Tru's parent organization is Fortune Brands Home Security

\$300 Million to \$500 Million

Associated Materials*

CUYAHOGA FALLS, OHIO
ASSOCIATEDMATERIALS.COM
800/922-6009

Product Lines: Vinyl windows and patio doors, multi-panel vinyl doors

Brands include Alside, Gentek, Alpine Windows, Preservation

Harvey Building Products

WALTHAM, MASS.
HARVEYBUILDINGPRODUCTS.COM
800/598-5400

Product Lines: Acoustic windows; entry doors; impact-resistant vinyl windows; patio doors; porch and patio enclosures; vinyl patio doors, replacement windows and sliding doors; and wood patio doors and windows

Subsidiaries include Harvey Windows + Doors, SoftLite Windows & Doors, Thermo-Tech Windows and Doors, Northeast Building Products

Novatech

SAINTE-JULIE, QUEBEC, CANADA
GROUPENOVATECH.COM
844/986-8001

Product Lines: Steel and fiberglass entry doors; vinyl patio doors; door glass; vinyl frames; injection-molded frames; louvers

Subsidiaries includes RSL Inc.

Sierra Pacific Windows

RED BLUFF, CALIF.
SIERRAPACIFICWINDOWS.COM
800/824-7744

Product Lines: 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; and wood-clad windows and doors

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Automation Systems Ltd.

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PRO-CLEAN CNC-27

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Photo courtesy of Glo Windows & Doors



Sierra is part of Sierra Pacific Industries

Steves & Sons Inc.

SAN ANTONIO
STEVESDOORS.COM
800/627-5111

Product Lines: 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, and wood entry and patio doors

Woodgrain Millwork*

FRUITLAND, IDAHO
WOODGRAIN.COM
888/783-5485

Product Lines: Wood-clad, wood, aluminum-clad, composite and vinyl windows; wood-clad and

vinyl patio doors; wood-clad, wood, aluminum-clad, and fiberglass entry doors via the Windsor Windows & Doors, Ashworth, and Monarch Windows and Doors brand names

Subsidiaries include Huttig Building Products

\$200 Million to \$300 Million

Champion*

CINCINNATI, OHIO
CHAMPIONWINDOW.COM
877/424-2674

Product Lines: Vinyl windows; steel and fiberglass entry doors; vinyl patio doors

Kolbe & Kolbe Millwork Co.*

WAUSAU, WIS.
KOLBEWINDOWS.COM
715/842-5666

Product Lines: Wood, vinyl and aluminum windows and patio doors; wood and fiberglass entry doors

Polaris Windows & Doors*

AUSTINTOWN, OHIO
POLARISWINDOWS.COM
216/926-6151

Product Lines: Vinyl windows and patio doors; steel and fiberglass entry doors

Polaris is part of Modern Builders Supply

ProVia*

SUGARCREEK, OHIO
PROVIA.COM
330/852-4711

Product Lines: Wood-clad and vinyl windows and patio doors; steel and fiberglass entry doors; aluminum storm doors and storm windows

Quaker Windows and Doors

FREEBURG, MO.
QUAKERWINDOWS.COM
800/347-0438

Product Lines: Aluminum sliding doors, swing doors and windows; aluminum-clad doors and windows; architectural windows; impact-resistant aluminum doors and windows; impact-resistant vinyl patio doors and



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windows; insulating glass units; multi-panel doors; multi-slide pocketing doors; patio doors; sliding doors; vinyl casement windows, doors, patio doors, replacement windows, sliding doors and windows; window wall; wood patio doors and windows; and wood-clad windows

United Window & Door Mfg.

SPRINGFIELD, N.J.
UNITEDWINDOWMFG.COM
800/848-4550

Product Lines: Composite patio doors and windows; and vinyl patio doors, replacement doors and windows, and windows

Weather Shield Mfg.*

MEDFORD, WIS.
WEATHERSHIELD.COM
800/222-2995

Product Lines: Wood, aluminum-clad wood, aluminum, vinyl-clad wood, fiberglass, and fiberglass-clad wood windows and patio doors

\$100 Million to \$200 Million

All Weather Windows*

EDMONTON, ALBERTA, CANADA
ALLWEATHERWINDOWS.COM
780/451-0670

Product Lines: Vinyl windows, clad windows, fiberglass and steel entry doors, patio doors, and multi-panel vinyl doors

Boral Windows LLC*

ATLANTA
BORALWINDOWS.COM
469/862-5178

Product Lines: Vinyl and aluminum windows and aluminum patio doors

Boral's parent organization is Boral North America

Crystal Window & Door Systems

FLUSHING, N.Y.
CRYSTALWINDOWS.COM
718/961-7300

Product Lines: Aluminum patio doors, sliding doors and windows; insulating glass units; tilt-and-turn windows; vinyl casement windows, patio doors, replacement windows, sliding doors and windows; and uPVC windows and sliding doors

Subsidiaries include Crystal California Window & Door Systems, Crystal Window & Door Illinois Manufacturing (Crystal Chicago), Crystal Pennsylvania Window & Door Systems

Lindsay Windows

NORTH MANKATO, MINN.
LINDSAYWINDOWS.COM
507/625-4278

Product Lines: Fiberglass entry doors; patio doors; and vinyl casement patio doors and windows, patio doors, replacement windows and windows

Subsidiaries include Lindsay Windows Minnesota, Lindsay Windows Missouri, Lindsay Windows Georgia, Lindsay Windows Illinois, Lindsay Windows Washington and Lindsay Windows California

Loewen Windows and Doors

STEINBACH, MANITOBA, CANADA
LOEWEN.COM
800/563-9367

Product Lines: Bi-fold doors; bronze-clad doors and windows; copper-clad doors and windows; impact-resistant doors and windows; multi-panel doors; multi-slide pocketing doors; patio doors; pivot doors; sliding doors; tilt-and-turn windows; wood entry doors, patio doors and windows; and wood-clad doors and windows

Plastpro

LOS ANGELES
PLASTPROINC.COM
310/693-8600

Product Lines: Fiberglass entry doors, polyfiber door frames, glass inserts, vinyl planking and wainscoting

Subsidiaries include JM Eagle

Window Designs Group*

TORONTO, ONTARIO, CANADA
VINYLWINDOWDESIGNS.COM
416/741-7820

Product Lines: Vinyl windows and patio doors; aluminum windows; steel entry doors; fiberglass entry doors

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

Trimlite

RENTON, WASH.
TRIMLITE.COM
800/929-3371

Product Lines: Barn doors; bi-fold doors; door glass; entry doors; fiberglass entry doors; fire-rated doors; glass exterior and interior doors; impact-resistant doors; interior doors; patio doors; prehung doors; and wood entry doors, interior doors and patio doors

Subsidiaries include CODEL Doors, Builders Hardware

Trinity Glass International

FEDERAL WAY, WASH.
TRINITYGLASS.COM
253/875-6700

Product Lines: Door glass; entry doors; fiberglass entry and patio doors; fire-rated doors; impact-resistant doors and vinyl patio doors; and patio doors

Subsidiaries include Signamark, Feather River Doors

Wincore Windows and Doors

PARKERSBURG, W.VA.
WINCOREWINDOWS.COM
304/424-3880

Product Lines: Entry doors; fiberglass entry and patio doors; impact-resistant doors, vinyl patio doors and vinyl windows; insulating glass units; patio doors; and vinyl casement windows, patio doors, replacement windows, sliding doors and windows

\$75 Million to \$100 Million

Air Master Windows and Doors

BARCELONETA, PUERTO RICO
AIRMMASTERPR.COM
787/623-1800

Product Lines: Aluminum windows; bi-fold doors; entry doors; glass interior doors; interior doors; pivot doors; skylights; sliding doors; and storm windows

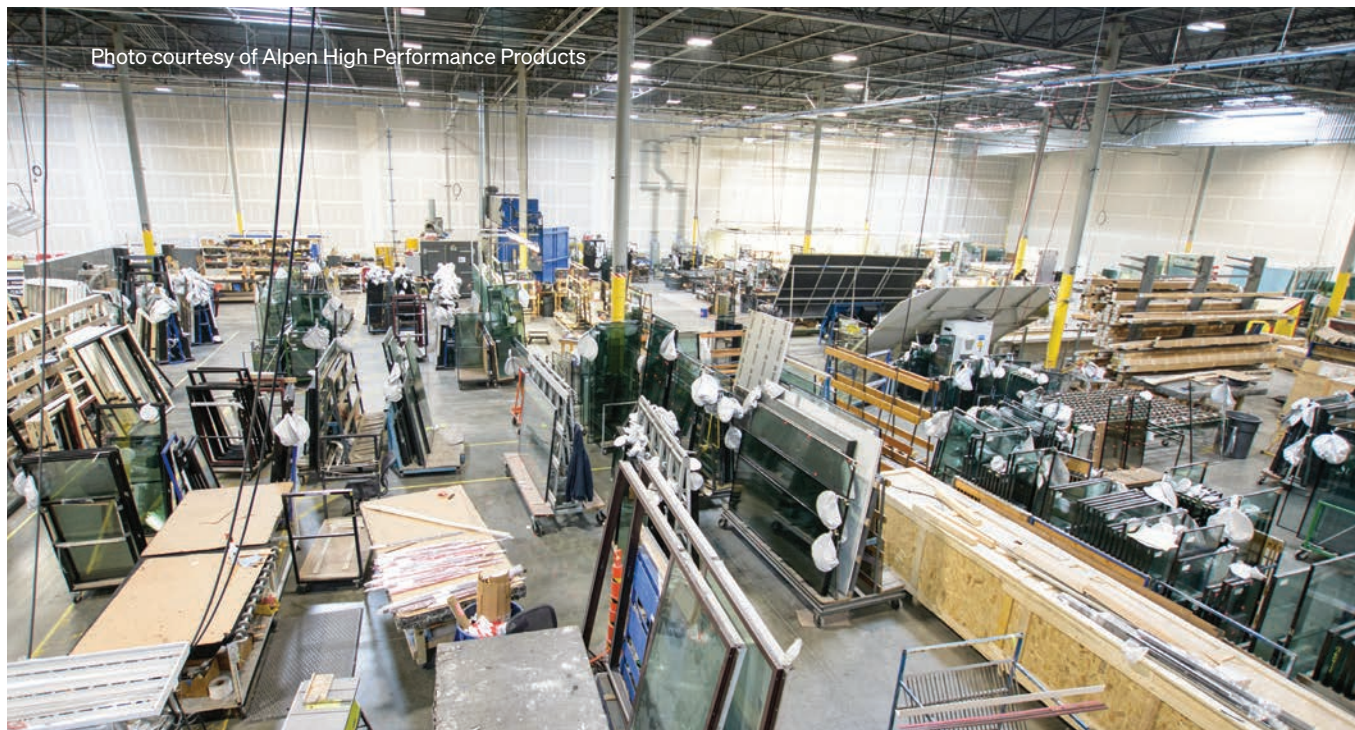
Subsidiaries include Megalum and sister company is Valmeg LLC

Photo courtesy of All Weather Architectural Aluminum





Photo courtesy of Alpen High Performance Products



Air Master Windows and Doors' parent company is Air Master Group

Elevate Windows and Doors

GRAND PRAIRIE, TEXAS
ELEVATEWINDOWS.NET
439/490-1100

Product Lines: Vinyl windows, sliding and patio doors

Midway Windows & Doors

CHICAGO
MIDWAYWINDOWS.COM
708/594-2600

Product Lines: Vinyl casement windows, patio doors, replacement doors and windows and new construction windows

Simpson Door Co.

MCCLEARY, WASH.
SIMPSONDOOR.COM
800/746-7766

Product Lines: Barn doors; bi-

fold doors; entry doors; fire-rated doors; glass exterior and interior doors; impact-resistant doors; interior doors; patio doors; pivot doors; and wood entry, interior and patio doors

Thompson Creek Window Co.*

LANHAM, MD.
THOMPSONCREEK.COM
866/572-7335

Product Lines: Replacement vinyl windows and patio doors; steel and fiberglass entry doors

Viwinco Inc.

MORGANTOWN, PA.
VIWINCO.COM
610/286-8884

Product Lines: Impact-resistant doors; impact-resistant vinyl multi-panel patio doors; vinyl patio doors and windows; multi-panel doors; multi-slide pocketing doors; patio doors; sliding doors; vinyl casement

windows, doors, multi-panel patio doors, patio doors, replacement windows, sliding doors, windows; and window wall

Wallside Windows

TAYLOR, MICH.
WALLSIDEWINDOWS.COM
313/292-4400

Product Lines: Vinyl windows and patio doors

WinDor

BREA, CALIF.
WINDORSYSTEMS.COM
866/244-2193

Product Lines: Bi-fold doors and windows; multi-panel doors; multi-slide pocketing doors; patio doors; sliding doors; and vinyl casement windows, doors, multi-panel patio doors, patio doors, replacement doors and windows, sliding doors, swing doors and windows

Window Mart*

ROYAL, ARK.
WINDOWMART.COM
888/283-6278

Product Lines: Vinyl windows and patio doors

Subsidiaries include Windows USA and WinTransport

Window Mart's parent company is Big4 Companies

Vytex Windows

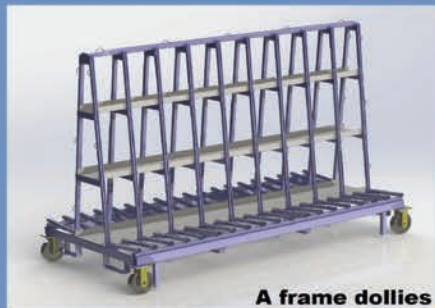
LAUREL, MD.
VYTEXWINDOWS.COM
877/747-8735

Product Lines: Vinyl casement windows, patio doors and replacement windows

\$50 Million to \$75 Million

Arcadia Custom

TUCSON, ARIZ.
ARCADIACUSTOM.COM



A frame dollies



Bungee cord IG rack



Finger rack



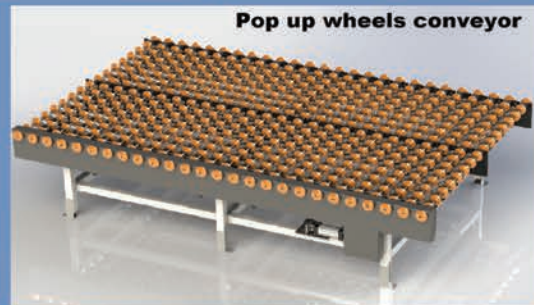
Harp rack

Need to increase production? We have solutions!

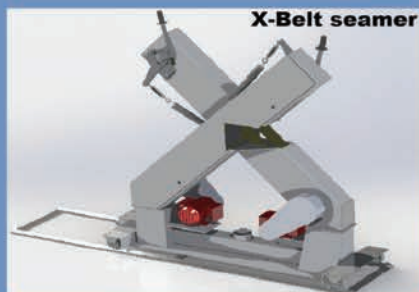
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Tilting table



Pop up wheels conveyor



X-Belt seamer



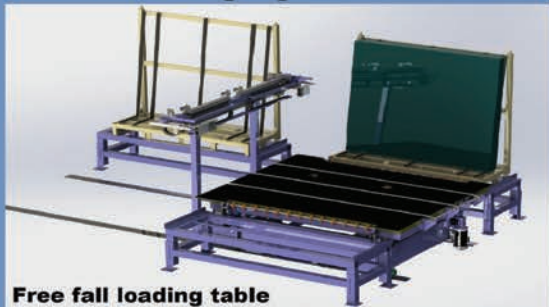
Application table



Edge deleter

The challenge for every business is finding ways to maximize revenue and minimize costs. Your machine and equipment should be up for this challenge too! Hopefully, identify several factors that may have negative impact to your bottom line. Imagine the possibilities of trading in this money lost activities in exchange for revenue-generating ones. Your machine or equipment purchasing decisions may be the single biggest factor in this equation, so proceed with good investment

Bromer equipment are made here in North America since 1984



Free fall loading table



Suction cup loader



Drawers



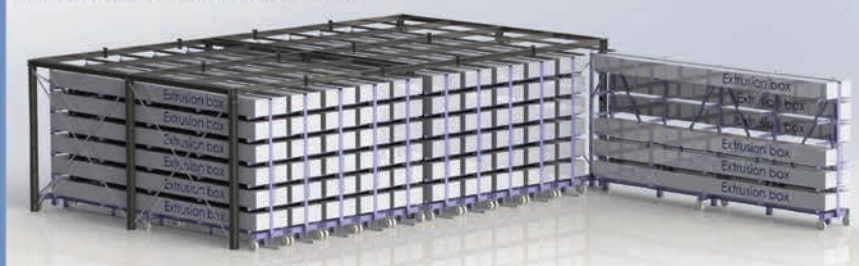
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or by phone at 450-477-6682

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GLASS EQUIPMENT MANUFACTURER



520/284-2070

Product Lines: Aluminum entry doors, patio doors, sliding doors, swing doors and windows; architectural windows; bi-fold doors; bronze-clad doors and windows; curtain wall; entry doors; glass exterior and interior doors; impact-resistant aluminum doors and windows; interior doors; multi-panel doors; multi-slide pocketing doors; patio doors; pivot doors; prehung doors; sliding doors; steel doors; thermal steel doors and windows; tilt-and-turn windows; window wall; and wood entry doors, interior doors, patio doors and windows

Arcadia's parent company is Arcadia Inc.

Builders FirstSource*

MARIETTA, GA.
BUILDWITHBMC.COM
770/429-9285

Product Lines: Vinyl windows

Castle Windows*

MOUNT LAUREL, N.J.
CASTLEWINDOWS.COM
800/360-4400

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

Conservation Windows*

MOUNT CARMEL, PA.
CONSERVATIONWINDOWS.COM
570/339-3374

Product Lines: Vinyl replacement windows; sliding glass doors; impact- and non-impact replacement windows

Conservation Windows' parent company is Regency Plus

Durabuilt Windows & Doors*

EDMONTON, ALBERTA, CANADA
DURABUILTWINDOWS.COM
800/544-3815

Product Lines: Vinyl windows and sliding patio doors, fiberglass entryways and swing patio doors

Earthwise Group LLC

LIBERTY TOWNSHIP, OHIO
EARTHWISEWINDOWS.COM
513/755-6707

Product Lines: Vinyl windows, doors, patio doors, casement windows and patio doors, multi-panel patio doors, sliding doors, sunrooms, swing doors, replacement windows and doors; impact-resistant vinyl windows and patio doors; fiberglass entry doors; security doors; steel doors; storm doors

Subsidiaries include Advanced Window Products, D&W Windows, Dasan Glass and Windows, Eastern Architectural Systems, Energy Shield Windows and Doors, Home Guard Industries, Earthwise Windows of Kansas City, RJT Industries, Sprouse Windows and Doors, Synergy Windows, Western Window

Fenplast*

CANDIAC, QUEBEC, CANADA
FENPLAST.COM
514/990-0012

Product Lines: Vinyl and hybrid windows; vinyl patio doors; entry doors

Subsidiaries include Les Fenêtres Lajeunesse and Atis Group

Gerkin Windows and Doors

SOUTH SIOUX CITY, NEB.
GERKIN.COM
402/494-6000

Product Lines: Aluminum sliding doors, storm doors and windows, and vinyl patio doors, doors and windows

LePage Millwork*

QUEBEC, CANADA
LEPAGEMILLWORK.COM
877/289-0191

Product Lines: Wood and aluminum-clad windows and doors; vinyl windows and doors; hybrid aluminum/vinyl windows; steel doors

Lincoln Windows & Patio Doors

MERRILL, WIS.
LINCOLNWINDOWS.COM
800/967-2461

Product Lines: Aluminum-clad and wood windows; aluminum-clad and wood patio doors; aluminum-clad multi-slide and pocketing patio doors

Lux Windows and Doors*

CALGARY, ALBERTA, CANADA
LUXWINDOWS.COM
403/276-7770

Product Lines: Aluminum-clad, hybrid and vinyl windows; aluminum-clad and vinyl patio doors; bi-parting and folding doors; fiberglass entry doors; skylights

Northeast Windows USA Inc.

MERRICK, N.Y.
NORTHEASTWINDOWSUSA.COM

516/378-6577

Product Lines: Vinyl casement windows, multi-panel patio doors, replacement doors and windows, and sliding doors

Subsidiaries include Quality Lineals USA Inc.

Tru Tech Doors*

VAUGHAN, ONTARIO, CANADA
TRUTECHDOORS.COM
888/760-0099

Product Lines: Wood edge steel doors; steel edge steel doors, fiberglass door panels; flush glazed door panels

Vinylmax Windows*

HAMILTON, OHIO
VINYLMAX.COM
800/847-3736

Product Lines: Replacement and new construction vinyl windows and doors

ViWinTech Window & Door Inc.

PADUCAH, KY.
VIWINTECH.COM
800/788-1050

Product Lines: Vinyl casement windows, multi-panel patio doors, patio doors, replacement doors and windows, sliding doors and windows

\$40 Million to \$50 Million

ATI Windows

RIVERSIDE, CALIF.
VINYLWINDOWS.CO
909/946-3697

Product Lines: Vinyl casement windows, multi-panel patio doors, patio doors, replacement



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doors and windows, sliding doors and windows
Subsidiaries include ABC Window Systems

Centra Windows

LANGLEY, BRITISH COLUMBIA
CENTRA.CA
888/534-3333

Product Lines: Entry doors; and vinyl casement patio doors, casement windows, doors, multi-panel patio doors, patio doors, replacement doors and windows, sliding doors, swing doors and windows

Subsidiaries include Supreme Windows

Croft LLC*

MAGNOLIA, MISS.
CROFTLLC.COM
800/222-3195

Product Lines: Aluminum and vinyl windows and patio doors

Hayfield Window & Door Co.

HAYFIELD, MINN.
HAYFIELDWINDOWS.COM
507/477-3224

Product Lines: Vinyl casement windows, doors, multi-panel patio doors, doors, replacement doors and windows, sliding doors and windows

Hayfield's parent company is Drum Capital

Hope's Windows Inc.*

JAMESTOWN, N.Y.
HOPESWINDOWS.COM
716/665-5124

Product Lines: Steel and bronze windows and doors, hurricane-

and impact-rated windows and doors

International Window Corp.

CORONA, CALIF.
INTLWINDOW.COM
800/477-4032

Product Lines: Acoustic windows; aluminum sliding doors and windows; multi-panel doors; multi-slide pocketing doors; and vinyl sliding doors, swing doors and windows

Subsidiaries include Precision Screen, International Window Stockton, Northstar

Mathews Brothers Co.

BELFAST, MAINE
MATHEWSBROTHERS.COM
207/338-3360

Product Lines: Vinyl casement windows, multi-panel patio doors, patio doors, replacement windows and windows

NT Window Inc.

FORT WORTH, TEXAS
NTWINDOW.COM
800/969-8830

Product Lines: Aluminum patio doors, porch enclosures, sliding doors, sunrooms and windows; architectural windows; impact-resistant vinyl patio doors and windows; patio doors; porch and patio enclosures; sliding doors; sunrooms; and vinyl casement windows, doors, multi-panel patio doors, patio doors, replacement doors and windows, sliding doors, sunrooms and windows

Okna Windows Manufacturing*

BRISTOL, PA.
OKNAWINDOWS.COM
215/788-7000

Product Lines: Vinyl and composite windows and patio doors

Solaris International*

QUEBEC, CANADA
SOLARIS-INTL.COM
800/363-0643

Product Lines: Vinyl windows and patio doors, hybrid windows (aluminum exterior, PVC interior)

Solaris' parent company is Solaris Québec Portes et Fenêtres Inc.

The Coeur d'Alene Window Company

SPOKANE, WASH.
COEURDALENEWINDOW.COM
509/340-0705

Product Lines: Patio doors; vinyl multi-panel patio doors, patio doors, replacement doors and windows, sliding doors and windows

Subsidiaries include McVay Brothers Inc.

YKK AP America Inc.

AUSTELL, GA.
YKKAP.COM
866/348-9091

Product Lines: Impact-resistant vinyl patio doors and windows; sliding doors; and vinyl casement windows, doors, patio doors, replacement windows, sliding doors and windows

Subsidiaries include Erie Architectural Products Inc.

YKK AP America's parent company is YKK AP Inc.

\$30 Million to \$40 Million

All Weather Architectural Aluminum*

VACAVILLE, CALIF.
ALLWEATHERAA.COM
800/680-5800

Product Lines: Aluminum windows and doors

Comfort View Products

NEWMAN, GA.
COMFORTVIEWPRODUCTS.COM
770/251-4050

Product Lines: Patio doors; and vinyl casement windows, patio doors, replacement windows and windows

Frontline Building Products*

GREEN BAY, WIS.
FRONTLINEBLDG.COM
800/760-8941

Product Lines: Aluminum-clad entry system, pre-clad door frame, patio door frame system, oversized direct set (wood/clad), wood/clad geometric windows, commercial doors

Subsidiaries include Frontline Building Products, Green Bay; Frontline Building Products, Medford; and Frontline Building Products, Merrill

Frontline's parent company is Bay Family of Companies

GlassCraft Door Co.

HOUSTON
GLASSCRAFT.COM
713/690-8282

Product Lines: Barn doors, fiberglass entry doors and wood entry doors

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AVERAGE COST



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AVERAGE COST

According to the Bureau of Labor Statistics, the number one most common occupational injury in the industry involving days off work is back injuries. The National Safety Council (NSC) estimates the cost of medically consulted injuries in 2019 to be \$42,000, which is the same cost of an installed Famatec Manipulator. Haeco is the exclusive Authorized Sales and Service provider for Famatec for the Glass and Window industry with the safest and most ergonomically effective solution for handling glass. Be safe, save money, and call Haeco today for a proposal for a Famatec Friendly configured specifically for your application. Data source: <https://injuryfacts.nsc.org/work/costs/work-injury-costs/>

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Madero

SASKATOON, CALGARY,
WINNIPEG
MADERO.CA
800/667-6977

Product Lines: Wood, composite and steel entry doors; interior doors; commercial doors

Subsidiaries include Penner Doors & Hardware, Security Building Supplies, Two Six Creative and West Four Distribution
Madero's parent company is the Westfour Group of Companies

Stanley Doors*

JOUBERT, MONTREAL,
CANADA
STANLEYDOORPRODUCTS.
COM
877/290-0941

Product Lines: Fiberglass and steel entry doors; patio doors; decorative glass

Stanley Doors is a subsidiary of Dusco Doors

Taylor Entrance Systems*

WEST BRANCH, MICH.
TAYLORDOOR.COM
800/248-3600

Product Lines: Fiberglass and steel entry doors

Sister companies include Waudena Entrance Systems and Diamond Kote Building Products
Taylor's parent company is Wausau Supply Co.

Thermal Windows Inc.*

TULSA, OKLA.
THERMALWINDOWS.COM
918/663-7580

Product Lines: Aluminum and vinyl windows and patio doors

Vector Windows & Doors

FERGUS FALLS, MINN.
VECTORWINDOWS.COM
800/739-9899

Product Lines: Vinyl casement windows, patio doors, replacement doors and windows, sliding doors and windows

\$20 Million to \$30 Million

Everlast Group of Companies

ETOBICOKE, ONTARIO,
CANADA
EVERLASTPRODUCTS.CA
800/897-5118

Product Lines: Aluminum patio doors, porch enclosures, sliding doors, storm doors and windows, sunrooms and windows; aluminum-clad windows; architectural windows; bi-fold doors and windows; composite entry doors; curtain wall; door glass; entry doors; fiberglass entry doors; hybrid aluminum/vinyl doors and windows; insulating glass units; multi-panel doors; patio doors; pivot doors; porch and patio enclosure; prehung doors; sliding doors; steel doors; storm doors and windows; sunrooms; vinyl casement windows, patio doors, replacement windows, sliding doors, windows; vinyl-clad windows; and wood entry doors and interior doors

Subsidiaries include Napa Valley Doors by Everlast and Alberta Vinyl Windows and Doors

Gilkey Window

CINCINNATI, OHIO
GILKEY.COM
513/769-4527

Product Lines: Acoustic win-

dows; fiberglass patio doors and windows; tilt-and-turn windows; and vinyl casement patio doors and windows, multi-panel patio doors, patio doors, replacement windows and doors, sliding doors and windows

Ideal Window

BAYONNE, N.J.
IDEALWINDOW.COM
800/631-3400

Product Lines: Vinyl windows, replacement windows, and patio doors

Inline Fiberglass Ltd.*

TORONTO, ONTARIO, CANADA
INLINEFIBERGLASS.COM
866/566-5656

Product Lines: Fiberglass windows and patio doors

Interstate Window & Door Co.

PITTSBURGH, PA.
INTERSTATEBLDG.COM
800/338-9997

Product Lines: Composite patio doors and windows; patio doors; sliding doors; and vinyl casement windows, replacement windows and windows

Interstate Window & Door's parent company is Interstate Building Materials Inc.

Joyce Manufacturing Co. Inc.

BEREA, OHIO
JOYCEMFG.COM
440/239-9100

Product Lines: Aluminum porch enclosures; architectural windows; insulating glass units; patio doors; porch and patio enclosures; sunrooms; and vinyl casement windows, doors,

multi-panel patio doors, patio doors, replacement windows, sliding doors, sunrooms, swing doors and windows

Moss Supply Co.

CHARLOTTE, N.C.
MOSSSUPPLY.COM
704/596-8717

Product Lines: Vinyl casement windows, doors, replacement doors and windows, and windows

Sun Windows Inc.

OWENSBORO, KY.
SUNWINDOWS.COM
270/684-0691

Product Lines: Bi-fold doors and windows; hybrid aluminum/vinyl windows; multi-panel doors; patio doors; vinyl casement windows and windows; window wall; and wood-clad doors and windows

Vinyl Kraft Inc.

NEW BOSTON, OHIO
VINYLKRAFT.COM
740/456-4949

Product Lines: Vinyl windows and patio doors

Winchester Industries

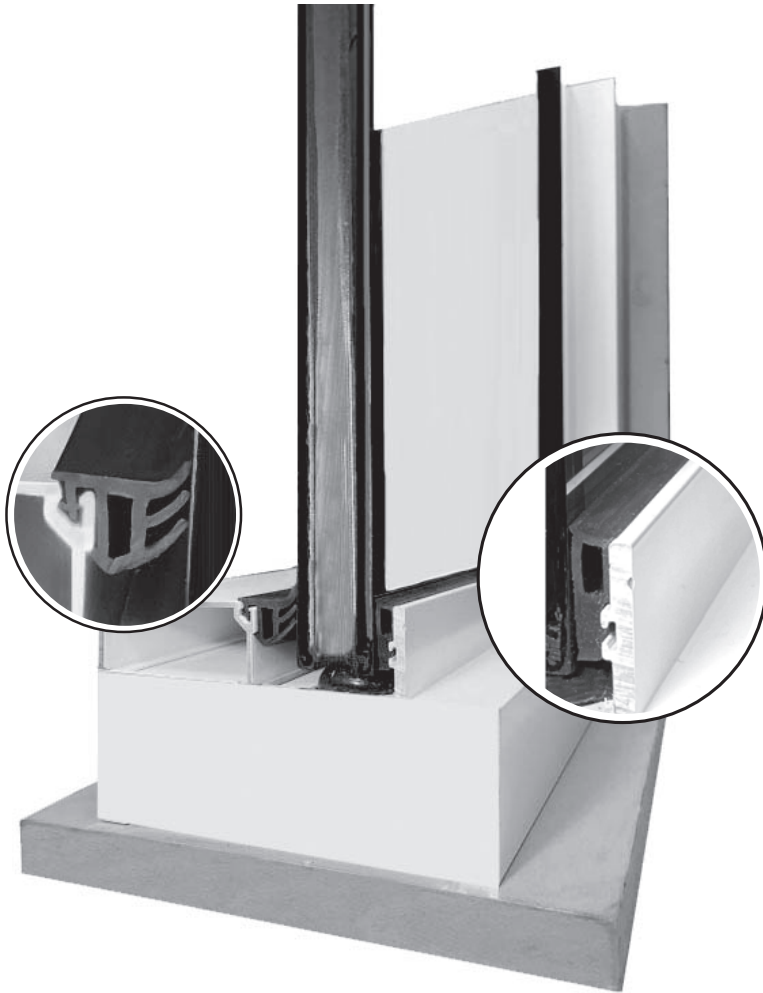
SALTSBURG, PA.
WINCHESTERWINDOWS.NET
724/639-3551

Product Lines: Patio doors; security windows; sliding doors; and vinyl casement windows, patio doors and replacement windows and doors

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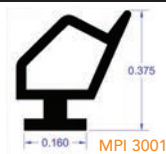
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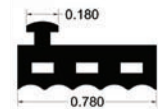
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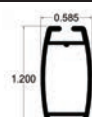
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MPI 3001



MPI 2572



MPI 6528



MPI 6550



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Photo courtesy of Vytex Windows



\$15 Million to \$20 Million

Assura Windows and Doors*

POMPANO BEACH, FLA.
ASSURAWINDOWS.COM
954/781-4430

Product Lines: Aluminum impact and non-impact windows and doors

Assura Windows and Doors' parent company is Amberley AWP Finance LLC

Climate Solutions Windows & Doors

FRANKLIN PARK, ILL.
CSWINDOWS.COM
847/233-9800

Product Lines: Vinyl windows and sliding doors; insulating glass units

Kensington HPP Inc.

VANDERGRIFT, PA.
KENSINGTONHPP.COM
724/845-5300

Product Lines: Acoustic windows and vinyl patio doors and replacement windows

Upstate Door

WARSAW, N.Y.
UPSTATEDOOR.COM
585/786-3880

Product Lines: Architectural windows; barn doors; bi-fold doors and windows; entry doors; fire-rated doors; impact-resistant doors; interior doors; multi-panel doors; multi-slide pocketing doors; patio doors; pivot doors; prehung doors; sliding doors; storm doors; and wood entry doors, interior doors, patio doors and windows

Less Than \$15 Million

Alpen High Performance Products

LOUISVILLE, COLO.
THINKALPEN.COM
303/834-3511

Product lines: Fiberglass and hybrid windows and doors

Burris Windows*

CARROLLTON, TEXAS
BURRISWINDOWS.COM
214/638-6525

Product Lines: Vinyl windows and patio doors

Euro-Vinyl Windows

WOODBIDGE, ONTARIO, CANADA
EVW.CA
905/851-9711

Product Lines: Vinyl windows and aluminum patio doors

Glass-Rite

ALBUQUERQUE, N.M.
GLASS-RITE.COM
505/764-9899

Product Lines: Vinyl windows and vinyl thermal break windows

Glo Windows and Doors

MISSOULA, MONT.
GLOWINDOWS.COM
406/721-2741

Product Lines: Aluminum windows and doors; wood-aluminum windows and doors; curtain wall windows; multi-panel lift-and-slide doors; aluminum entry doors; pivot doors

Seaway Mfg. Corp.

ERIE, PA.
SEAWAYMFG.COM
814/899-9900

Product Lines: Aluminum patio doors, porch enclosures, sunrooms and windows; impact-resistant vinyl windows; patio doors; porch and patio enclosures; sunrooms; and vinyl casement windows, patio doors, replacement windows, sunrooms and windows

Solar Innovations*

PINE GROVE, PA.
SOLARINNOVATIONS.COM
570/915-1500

Product Lines: Vinyl, wood and aluminum windows; clad windows; vinyl, wood and aluminum doors; vinyl, wood and aluminum operable walls; aluminum fixed and operable skylights; wood skylights; wood curtain walls; aluminum curtain walls

Solar Innovations' parent company is Fortune Home Brands & Security

Stewart Brannen Millworks

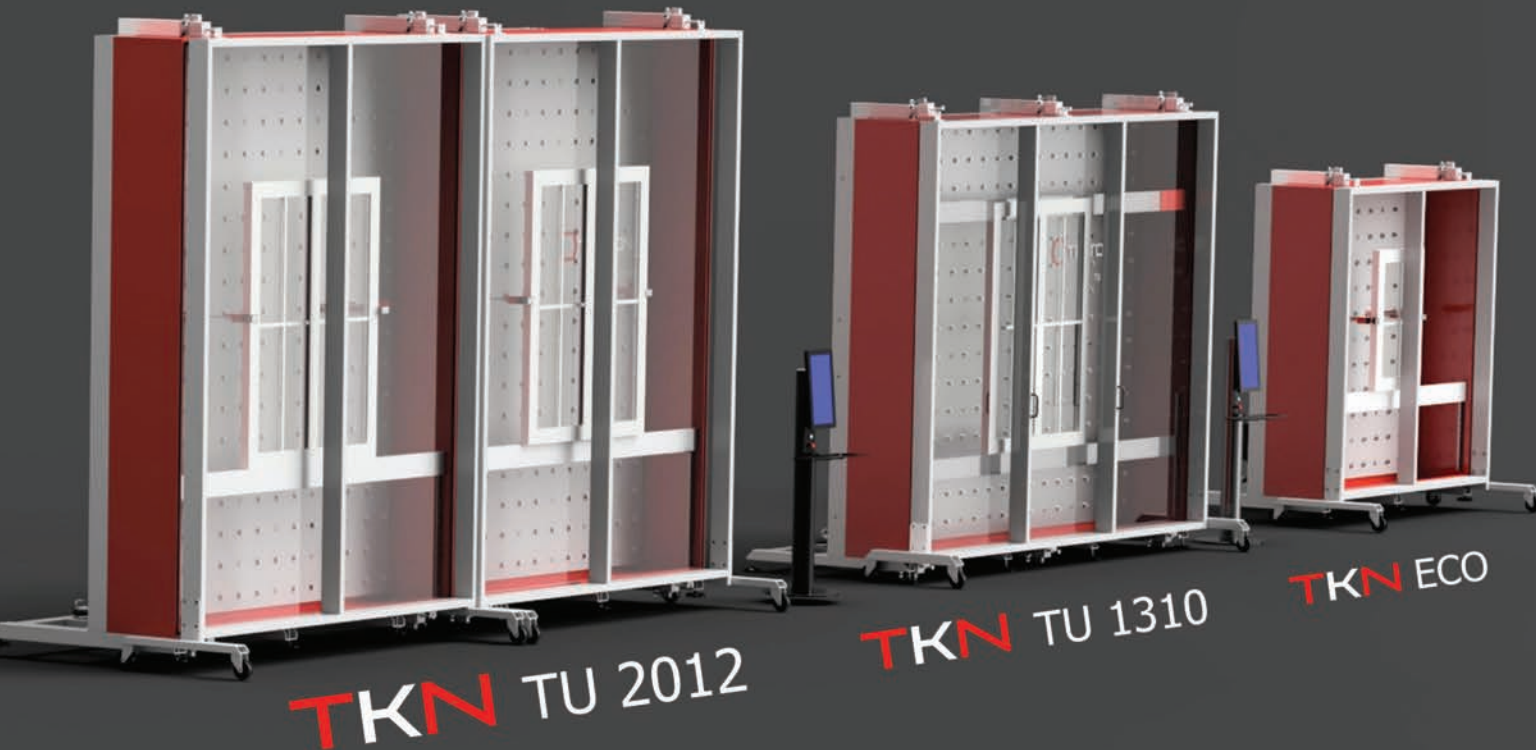
REGISTER, GA.
BRANNENMILLWORK.COM
912/488-2397

Product Lines: Impact-resistant doors and windows; and wood entry doors, interior doors, patio doors and windows

Van Isle Windows Ltd.

VICTORIA, BRITISH COLUMBIA
VANISLEWINDOWS.COM
250/383-7128

Product Lines: Vinyl windows, sliding patio doors, entry doors and skylights



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E-mail: info@tkni.ca
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Products



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01

01 / Norfield

The 2400 ASR Auto Double-Prep Strike Router machines strike jambs and ball catch head jambs on residential doors. It can prepare a double strike jamb every three to four minutes or a single strike jamb every four to five minutes. The strike plate can have full lip, no lip or a T-strike, and the machine can accommodate a strike plate from ½ to 8 inches. The system can hold a 70- to 96-inch jamb with a width of 2 ½ to 10 ½ inches and jamb thickness can be ¾ to 1 ½ inches. **800/824-6242 | NORFIELD.COM**

02



02 / All Weather Architectural Aluminum

The Series 9200 is a top hung thermally broken bifold door system that features a 2 ¼-inch stile and rail profile, 2 ¾-inch-thick panels, a pinch-proof design and is thermally broken with 1-inch OA insulated dual glazed units. Configuration options include an unlimited number of panels, TDL and SDL options, multiple threshold and handle hardware options, a maximum panel size of 42 by 144 inches, and anodized effect powder coating and Class I anodized finishes. **800/680-5800 | ALLWEATHERAA.COM**

03



03 / ODL Inc.

ODL Large Format Blink Blinds + Glass are available up to 8 by 8 feet. Available in tempered or annealed glass with single- or dual-operator design, the blinds have matching components in six colors and nine different low-emissivity coatings. Custom sizes range from 8 to 63 inches wide by 30 to 90 inches tall. The EasyGlide Operator is designed to reduce operating effort while raising, lowering and tilting blinds.

800/253-3900 | ODL.COM

Product/Solution

Low Profile Lock Handle // **Roto North America**

Challenge

Roto North America spotted a trend in the market for a lock handle on casement and awning windows that could meet several aesthetic design criteria to influence a positive user experience, in particular, a lower profile housing coming off the window frame.

Solution

Roto North America will introduce the Low Profile Lock Handle this summer, a line extension to its X-DRIVE casement and awning program. The handle is designed to have stylish features and will be available in multi- and single-point versions. Finish options will include several powder coat colors and architectural brushed nickel.

The “low profile” refers to the handle being about 50 percent lower to the frame versus existing lock handles. The flared lever on the bottom of the handle is also designed to allow for easier functionality by end-users.

Roto cites “overwhelmingly positive” responses to the handle design from several window manufacturers.

Other products in the X-DRIVE hardware family include operators, locking systems and hinges.





01

03



04



01 / Johnson Hardware

Available in residential and commercial grades, the 111MD Multi-Pass Pocket Door Hardware supports doors up to 150 pounds, the 100MD handles up to 200-pound doors and the 200MD can hold doors up to 400 pounds per individual door. The hardware is available with extruded aluminum I-beam tracks with four-wheel ball bearing hangers or aluminum box shape tracks with convex rails and three-wheel ball-bearing. Up to 192 inches of custom tracks can be created.

574/293-5664 | JOHNSONHARDWARE.COM

02 / Cornerstone Building Brands

The Simonton Reflections 5500 line is Missile C impact-resistant certified. Windows and patio doors with SafePoint impact-resistant laminated glass are appropriate for inland coastal areas where Missile D certification is not required and wind speeds are less than 140 mph. SafePoint glass is crafted from a durable interlayer sealed between two layers of glass. To pass certification, glass must resist breaking when hit by a four-pound, 4-foot-long, two-by-four piece of lumber shot at 40 feet per second (27 mph).

800/746-6686 | SIMONTON.COM

03 / Andersen Windows

The expanded 400 Series casement now includes a contemporary profile option. Available on all 400 Series casements, awning and picture windows, the contemporary stop option features an updated contemporary stop, grille profile and hardware design.

866/760-2857 | ANDERSENWINDOWS.COM



02



04 / ProVia

Simulated Divided Panels are newly available for select Signet Fiberglass Fir entry doors. The 3- and 5-inch-wide fiberglass grids are available on 8-foot-tall or shorter doors and are applied directly to the skin of a solid door or to the surface of a full lite of glass. Available in numerous geometric configurations, the doors can be finished from a selection of seven stain colors, seven glazed finishes or solid color paint. **800/669-4711 | PROVIA.COM**



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People

ON THE MOVE



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Kuusisto

Atte Kuusisto has been chosen to succeed *Jukka Manner* as CEO of **Sparklike**. Manner served as CEO for two years. He will continue working on a strategic development project for the company to explore the possibility of offering insulating glass measurement solutions as a service to various operators in the construction industry. Kuusisto has experience in sales and sales management roles, as well as profitable business growth. He comes from the IT services industry.



Hussein

GED Integrated Solutions Inc. appointed *Ashraf "Ash" Hussein* to the position of product marketing manager – IG. Hussein joined GED in 2017 as an IG technology engineer. In his new role, Hussein will manage all commercial activities for GED IG products and manage marketing efforts surrounding product development as well as ongoing sales and customer support programs. Additionally, this position is responsible for supporting efficient, effective and quality IG manufacturing use among customers.



Pelletier

James "Jim" Pelletier has joined **Masonite International Corp.** as senior vice president, general counsel and corporate secretary, replacing Robert "Bob" E. Lewis. Pelletier joins Masonite from Barnes Group Inc., where he served as senior vice president, general counsel and secretary. He previously held corporate counsel positions as

associate counsel with Pratt & Whitney and as compliance counsel for GE Aviation.



Mocker

YKK AP America Inc. hired *Peter Mocker* as the director of its technology and business solutions group where he will lead strategy development, execution and planning of the information technology future of YKK AP. Mocker comes to YKK AP with more than 19 years of experience in the technology industry. In his role, Mocker will strengthen customer, employee and peer-to-peer connectivity and interaction as well as system solutions, according to the company.

Milgard Windows & Doors' Patrick Heninger, who joined the company in 1999, has been promoted to plant manager at the company's Simi Valley facility. In his most recent role as plant manager, he manages nearly 400 team members.



Powell

A+W Software hired *Loren Powell* as project manager where he supports A+W Cantor and A+W Clarity. Powell will communicate with stakeholders, map out timelines, assess project risks and opportunities, and execute on each project life cycle phase.



Schmitt

The company also welcomed back *Renaud Schmitt*, an A+W veteran returning to the North American Cantor window and door division team as a customer support specialist. He worked for A+W for 14 years,

from 2005 to 2019. In his new position, Schmitt will support A+W's growing North American customer base, implement upgrades or new software solutions, and troubleshoot any opportunities that arise.



Volkema

ODL Inc. has named *Dan Volkema* vice president of finance. Volkema comes to ODL from Whirlpool Corp., where he spent the past six years in commercial reporting and analytics, sales channel finance, and managing financial operations for 14 North American manufacturing locations.



Guernsey



Christensen

Jeld-Wen Holding Inc. announced the resignation of CFO *John Linker* to pursue another CFO opportunity in a different industry. He transitioned his responsibility to *David Guernsey*, currently EVP and president of Jeld-Wen Europe, who will serve as acting CFO while the company conducts a search for a permanent replacement. As part of a previously planned transition, *William (Bill) Christensen* joined Jeld-Wen as EVP and president of Jeld-Wen Europe on April 1.

Quanex Building Products promoted several team members in support of its service for North American Fenestration customers.

Irish Rubright was promoted from customer service manager to inside sales manager. In her new position, she will



Rubright

direct the development of standardized processes across IG Systems. She will continue to manage the customer service team.



Edwards

Tonya Edwards was promoted from senior customer service representative to customer service supervisor, where she will be responsible for supervising the customer service team throughout IG Systems to develop rapport, communication and relationships with internal and external customers.



Swigert

Sarah Swigert was promoted to import/export compliance manager for NAF. In her new position, she will be responsible for the development of import and export compliance programs across the NAF locations.



Schield

Weather Shield Windows and Doors


founder, Edward "Lee" Schield, passed away at 88 years old. "Lee's passion for this industry

and his entrepreneurial spirit are what has made Weather Shield the great company it is today," said a company statement. "He was most comfortable and in his element when he was touring his manufacturing facilities. Lee loved to talk windows and doors with anyone who would listen." Lee is survived by his loving wife of 68 years, Clarice, and his three sons, Brian, Kevin and Mark.

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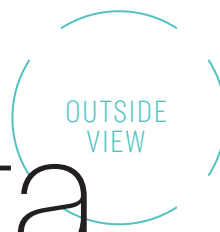
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Market Data



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Vinyl, Wood Windows Among Top Projects for ROI

Vinyl window replacement, wood window replacement and steel entry door replacement were among the top 10 projects for high ROI for homeowners, at 67 percent, 66 percent and 64 percent, respectively, according to Zonda Media's 35th annual Cost. Vs. Value Report. These findings are the latest in a multi-year streak of exterior replacement projects delivering the best ROI.

Doors and Molding Growth

7.5%

compound annual growth rate in doors and molding is expected for the professional market between 2022 and 2026. *Source: Home Improvement Research Institute*

Builder Confidence

69

Builder confidence for newly built-single family homes fell in May for the fifth straight month and marked the lowest reading since June 2020. *Source: National Association of Home Builders/Wells Fargo Housing Market Index*

Single-family Home Sales

-8.6%

decline in the sales of newly built, single-family homes in March. *Source: U.S. Department of Housing and Urban Development and the U.S. Census Bureau*

April 2022 window and door stock decrease -1.5%

April 2022 S&P 500 decrease -9.1%

12-month window and door return -7.5%

12-month S&P 500 return -1.5%

Building products stocks and the broader market continue to be negatively impacted by volatility created from the expectation of restrictive central bank policy, continued escalation with Russia/Ukraine, supply chain stress and persistently high levels of inflation. The combination of these factors have weighed on market participants. However, despite the volatility and uncertainty with the macro economy, building products companies continue to generate record results given the number of homes sold with construction underway and acceleration in repair and remodel activity given the aging housing stock and lock-in effect from higher mortgage rates. *Source: Lincoln Financial*

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