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Building Resilience in Window, Door, and Glass Manufacturing

How to stay strong, adapt fast, and scale smart in an unpredictable market

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Volatility Is the New Normal

Window, door, and glass manufacturers across North America are no strangers to disruption. Tariffs, supply chain instability, skilled labor shortages, and price fluctuations have become persistent – not occasional – challenges.

Add shifting customer expectations and rising demand for product customization, and the result is a sector where unpredictability is the baseline.

For manufacturers operating in this space, resilience isn't just about risk avoidance – it's about business survival and scalable growth. Resilient businesses maintain delivery promises, protect margins, and adapt to change without costly downtime or customer churn.

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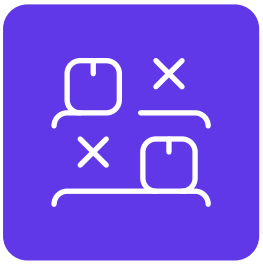
What You're Up Against: Key Pain Points

Window, door, and glass manufacturers working to build resilience commonly face these hurdles:

Tariff shocks and material price swings that hit margins overnight

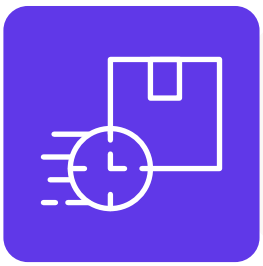
Slow quoting and approval cycles for custom products



Unreliable suppliers or long lead times that halt production

Lack of real-time visibility across inventory, production, and demand

Labor shortages and high turnover, especially in skilled trades



Pressure to reduce lead times without increasing costs

Disconnected processes between sales, engineering, and production

Reactive firefighting instead of proactive risk mitigation

Plays for Building Resilience in Window, Door, and Glass Manufacturing

Play 1:

Diversify and Digitize Your Supply Chain

Resilience starts upstream. When tariffs spike or a single supplier stalls, your entire production line feels the impact. That's why modern manufacturers are rethinking their supply chains – from who they source from to how they track deliveries. Building resilience here means shifting from reactive procurement to a proactive, data-driven approach that keeps production moving no matter what happens externally.

What to Do

Create a more flexible and data-driven supplier network to reduce disruption from tariffs, delays, or shortages.

Steps to Take

- Diversify supplier base geographically
- Use inventory optimization tools to set strategic buffers
- Share demand forecasts with key suppliers
- Enable real-time visibility across inbound inventory

Relevant Capabilities

- Inventory optimization
- Procurement planning
- Business activity monitoring

Customer Insight

Joyce Manufacturing **cut inventory management time by 90%** and **improved glass yield on 85% of SKUs** by implementing FeneVision's Inventory and Glass Optimization tools.

Best Practices

Maintain active relationships with backup suppliers

Automate inventory data collection to eliminate guesswork

Use dashboards to monitor supplier performance and delivery timelines

Play 2:

Automate Key Production Processes

When labor is tight, automation extends your capacity. Even the most skilled teams can't keep up with rising demand, customization, and margin pressures without help. The answer isn't fewer people – it's smarter processes. Strategic automation helps you scale output, reduce errors, and protect quality, all while using your existing workforce more effectively.

What to Do

Scale output and improve quality with automation that complements your workforce – not replaces it.

Steps to Take

- Identify high-impact areas for automation (cutting, CNC machining, glazing)
- Implement digital scheduling and shop floor control
- Introduce machine-integrated quality checks (sensors, cameras)

Relevant Capabilities

- Shop floor automation
- Machine interface and CNC integration
- Quality assurance automation
- Digital production scheduling

Customer Insight

With FeneVision, General Glass achieved **real-time visibility into each phase of production**, seamless integration with inventory management and accounting, and **improved capacity planning.**

The integration of FeneVision OPTI further **optimized their yield**, allowing the company to **use scrap spaces for future production** and add custom pieces easily.

Best Practices

- Start with a pilot cell before scaling plant-wide
- Combine automation with cross-training to boost workforce agility
- Use machine data to schedule predictive maintenance

Play 3:

Connect Sales, Engineering, and Production

Disconnected teams create delays and costly errors. Whether its sales promising an unbuildable product or engineering reworking specs manually, lack of integration slows you down. By linking quoting, design, and manufacturing into a single workflow, manufacturers can streamline custom orders and boost both speed and accuracy even under pressure.

What to Do

Eliminate delays and errors by tightly integrating product configuration, engineering design, and manufacturing.

Steps to Take

- Replace manual quoting with rules-based CPQ
- Automate CAD generation directly from quote data
- Link BOMs and cut lists directly to the production schedule

Relevant Capabilities

- CPQ (Configure-Price-Quote)
- CAD automation
- Engineering-to-manufacturing integration
- BOM and cut list generation

Customer Insight

With the combination of Cyncly's V6 and contractERP tools, Crystal realized a significant **ROI within twelve months** of implementation.

Production processes became 3 – 5 times faster, lead times improved to meet or exceed customer expectations, and the company **gained real-time data for better decision-making.**

Best Practices

- Validate every sales configuration against manufacturability rules
- Standardize templates for frequently ordered custom products
- Keep a single data source for all engineering specs

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Play 4:

Build a More Agile Workforce

Your customers expect speed and flexibility – even in tough times. But more options shouldn't mean more complexity behind the scenes. Resilient manufacturers use smart configuration to offer tailored products while maintaining operational control. It's how you win jobs when competitors are too slow to quote or too rigid to deliver.

What to Do

Make your team more flexible and future-ready by investing in training, smart tools, and real-time guidance that supports quality and consistency on the floor.

Steps to Take

- Crosstrain operators on multiple machines and stations
- Automate material optimization and machinery integration
- Invest in machinery that is supported by your ERP or MES
- Replace tribal knowledge with digital prompts and visual checks that reinforce key steps
- Provide intuitive shop floor tools with built-in quality cues and reminders

Relevant Capabilities

- User-friendly, real-time shop floor interfaces
- Workforce planning tools for skill tracking and role coverage
- Visual quality prompts and in-process error prevention
- Analytics dashboards to help supervisors monitor training, performance, and gaps

Customer Insight

With FeneVision, United Plate Glass achieved **superior production visibility**, allowing **employees to measure their effectiveness** and **optimize performance**.

Best Practices

Create onboarding programs that include digital confidence alongside job skills

Rotate roles quarterly to reduce over-reliance on individual experts

Use visual quality control checks and in-process prompts to catch errors early – especially on configurable or custom jobs

Highlight commonly missed options or steps with digital alerts or visuals during production

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Play 5:

Accelerate Customer Response with Configurable Products

Your customers expect speed and flexibility – even in tough times. But more options shouldn't mean more complexity behind the scenes. Resilient manufacturers use smart configuration to offer tailored products while maintaining operational control. It's how you win jobs when competitors are too slow to quote or too rigid to deliver.

What to Do

Offer more product options while keeping operations stable by managing complexity with rules-based configuration.

Steps to Take

- Define clear product option rules and constraints
- Enable customer/dealer self-service portals
- Streamline workflows for quote approvals and order changes

Relevant Capabilities

- Configurable product modeling
- Dealer/self-service portals
- Real-time lead time estimation
- Change order management

Customer Insight

Midway Windows accelerated customer response and saw strong ROI by implementing a dealer portal, FeneVision WEB. Customers now self-serve quotes in real time with just an hour of training, reducing CSR workload and increasing capacity – delivering faster support and greater efficiency across the board.

Best Practices

- Use CAD visualization to reduce customer misunderstandings
- Automate lead time estimates based on real-time inventory
- Prioritize flexible BOMs that can substitute components when needed

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Play 6:

Use Data to Detect Risks and Drive Improvement

You can't fix what you can't see. From material delays to workforce gaps to rising defect rates, every risk leaves a data trail. Resilient companies surface issues early, act fast, and improve continuously. That requires more than reports – it takes live dashboards, smart alerts, and a culture of learning from every disruption.

What to Do

Embed resilience into your operations through continuous visibility and data-driven learning.

Steps to Take

- Create KPIs that track risk indicators (e.g., late orders, scrap rate, labor gaps)
- Use dashboards and alerts to flag issues before they escalate
- Implement structured continuous improvement processes

Relevant Capabilities

- Business activity monitoring
- Real-time analytics and dashboards
- KPI tracking and reporting
- Workflow-based alerts

Customer Insight

With FeneVision, Lindsay achieved rapid ERP implementation at new locations, streamlined data management, and enhanced operational efficiency.

Regular automated reports improved decision-making, while the integrated system allowed for seamless production transfers between locations and real-time order tracking.

Best Practices

- Include operational, supplier, and customer data in your dashboards
- Review and refine KPIs quarterly
- Share wins and improvements company-wide to build engagement

Troubleshooting Common Pitfalls

Even well-intentioned resilience strategies can misfire without careful execution. From fragmented data to rushed implementations, the path to a stronger, more adaptable business is not without risk. This section highlights common pitfalls that manufacturers encounter when building resilience – and offers practical guidance for recognizing and correcting them early.

Problem	Fix
Relying too heavily on one supplier	Ensure you have backup sources for glass and hardware. Use generic part definitions in CPQ to avoid locking into single-supplier SKUs.
Estimated job margins don't match actuals	Review costing logic and BOM accuracy, including scrap rates, labor inputs, and material dimensions. Ensure scrap is accounted for in frame, glass, and other key components.
Automation created new bottlenecks elsewhere	IG lines, tempering furnaces (glass), and remakes from glass cutting and saw stations are common choke points. Map the full production flow to ensure automation upstream doesn't overload these constrained areas.

Problem	Fix
New systems confuse shop floor workers	Prioritize hands-on training and select systems with modern, intuitive interfaces. Pair new users with “super users.”
No clear owner for resilience initiatives	Appoint a dedicated resilience lead or cross-functional task force with clear KPIs and executive sponsorship.
Data quality issues stall integration	Run a one-time data cleanup before integration. Establish ownership for ongoing data governance.
Cross-training plans stall due to production pressure	Build cross-training into your weekly or monthly schedule. Use lighter production periods for rotations and knowledge sharing.
Manual lead time updates cause missed delivery dates	Use one system that supports both CPQ and scheduling, factoring in customer shipping day(s), product lead times, production capacity, and backlog to save time and increase on-time delivery ratings.

Frequently Asked Questions

Resilience isn't built overnight – and even experienced manufacturers have questions as they start adapting to constant change. Below, we've answered some of the most common concerns from leaders across the window, door, and glass industry, from getting started to scaling with confidence.

Q: **How do I know where to start?**

A: Begin with a quick diagnostic across supply chain, production, and sales-to-production flow. Choose one high-impact, low-risk area to pilot.

Q: **Isn't automation too expensive right now?**

A: Many firms begin with partial automation or software-led improvements (like automated quoting, digital scheduling, and material optimization) that deliver fast ROI before investing in more saws, CNC work centers or additional cutting lines.

Q: **How can we compete with big manufacturers on resilience?**

A: Agility is your advantage. Smaller firms often adapt faster – especially if they invest in connected workflows, flexible teams, and automation early.

Q: **How do we maintain our personal touch with customers if we implement self-service portals and automation?**

A: Automation handles routine tasks so your team can focus on higher-value interactions. It actually enhances the customer experience when combined with fast, reliable service.

Q:

What if we implement all these changes and then our market demand drops?

A:

The efficiency and scalability gained through these changes help you maintain profitability at lower volumes – and position you to seize opportunities when the market rebounds.

Q:

Our team is worried that automation and new software will eliminate jobs. How do we address this?

A:

Frame technology as an enabler. Emphasize upskilling, safety, and reduced manual strain. Show examples of job evolution, not elimination, and involve employees early in the change process.

Q:

How do we evaluate which capabilities we actually need – and which we don't?

A:

Focus on the business outcome first: faster quoting, fewer errors, shorter lead times. Then map capabilities (like CPQ, CAD automation, production scheduling) to that outcome. Avoid buying tech for tech's sake.

Q:

What's the biggest mistake companies make when trying to become more resilient?

A:

Trying to change everything at once without a phased plan or cross-functional alignment. Resilience is a journey – prioritize plays that solve urgent problems and build momentum.

Next Steps: Scaling and Future-Proofing

Building resilience is more than a one-time response to disruption – it's an ongoing strategy for growth, adaptability, and long-term competitiveness. As your organization stabilizes core operations and sees early results from capability-driven improvements, the next step is to scale those gains across departments, locations, or product lines.

Embed resilience into your company's DNA, leverage advanced strategies like predictive analytics and network-wide planning, and future-proof your business against whatever comes next.

Implementing digital twins to simulate production risks

Exploring predictive maintenance for high-value equipment

Building modular manufacturing cells that scale with demand

Creating resilience scorecards across teams and facilities

Preparing for new challenges like ESG regulation, electrification, and automation-related compliance

Conclusion: From Theory to Action

Resilience in window, door, and glass manufacturing isn't just about reacting to the unexpected. It's about proactively designing your business to perform – no matter the market conditions.

From tariffs and labor shortages to shifting lead times and customer expectations, today's challenges demand more than short-term fixes. They require a connected, capability-led strategy that helps you respond faster, plan smarter, and scale with confidence.

In this playbook, you've explored practical strategies used by leading manufacturers to stay competitive and agile. Now it's time to take the next step.

You've read the theory
Now see it in action

Book a tailored demo to explore how your business can build resilience through quoting automation, visual configuration, integrated scheduling, production planning, and data-driven optimization – powered by solutions built specifically for window, door, and glass manufacturing.

Get a Demo