



Greenfield Manufacturing Strategy

Designing a 600,000-Unit Residential Fiberglass Door Manufacturing Facility

AT A GLANCE

A major manufacturer in the residential door industry identified a significant growth opportunity in exterior fiberglass doors, a category with strong consumer demand but they no internal manufacturing capability. Rather than pursue an acquisition outright, leadership committed to understanding exactly what it would take to build from scratch.

The result was a comprehensive greenfield opportunity assessment, a board-ready plan covering facility design, process architecture, equipment specification, automation strategy, financial modeling, supplier selection, and a 20-year business forecast. The depth and rigor of this analysis ultimately informed the company's decision to pursue a strategic acquisition instead of building new, avoiding the cash flow gap of a multi-year greenfield ramp.

INDUSTRY

Residential Building Products
Manufacturing

ROLE

Brought in to lead manufacturing strategy, cross-functional planning and board level investment analysis

PHASE 1 TARGET

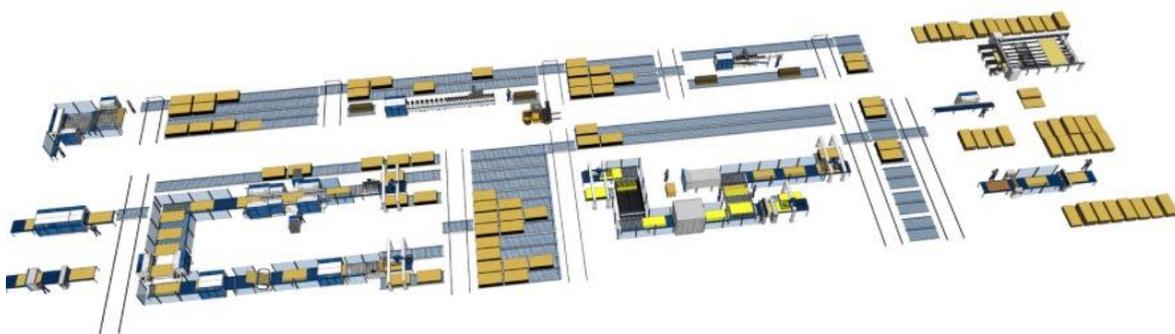
300,000 doors/year

FULL CAPACITY

600,000 doors/year

INVESTMENT ASSESSED

\$80M Greenfield Build



CLIENT'S GOALS

The company sought to enter the exterior fiberglass residential door market with a world-class manufacturing operation. The engagement required building the complete business case and manufacturing blueprint from the ground up with no existing facility, equipment, or process infrastructure to build from.

Key objectives included:

- Design a greenfield facility capable of producing 300,000 doors per year in Phase 1, scalable to 600,000 at full build-out
- Specify all manufacturing processes across five core production areas: fiberglass skin pressing, hollow door assembly, PU foam filling, final door trimming, and finished goods packing
- Develop a phased automation strategy that balanced capital investment with production volume growth
- Establish supplier partnerships across five critical categories: raw materials (foam, wood, fiberglass), fiberglass presses, PU filling and metering equipment, assembly stations, and trimming/sizing machinery
- Manage a SKU portfolio of 500–750 product variants across the full range
- Produce a complete business opportunity model including 5-, 10-, and 20-year forecasts covering sales, labor, materials, scrap, inventory, distribution, and lead times
- Develop site requirements covering environmental compliance, electrical power, utilities, waste disposal, and labor availability
- Present a board-ready investment case to the CEO, Owner, and Board of Directors



THE CHALLENGE

The central challenge was not simply designing a factory, it was building a credible, board-ready investment proforma for an \$80M capital commitment in a market the company had never operated in.

This required answering three hard questions simultaneously:

1. How much automation is the right amount?

Fully automating a greenfield fiberglass door plant from day one would maximize throughput but would require capital that wasn't yet justified by volume. The fiberglass skin pressing process illustrated this tension clearly. Manual charge layup limited the press to roughly 45% of its possible cycle time, but it allowed the facility to launch without the capital cost of automated cutting and stacking systems. The plan required mapping exactly when automation investment would be triggered by volume thresholds and designing the facility so those upgrades could be added without disrupting ongoing production.



2. How do you turn five expert perspectives into one coherent plan?

Building a greenfield business case requires input from every function simultaneously, and each function speaks a different language. Finance, Engineering, Purchasing, and Manufacturing each contributed critical expertise to this project. The challenge was not alignment, as the team was genuinely collaborative, but integration. Synthesizing five distinct workstreams into a single, internally consistent plan that could withstand board scrutiny required rigorous program management from start to finish.

3. How do you model a business that doesn't exist yet?

With no operational history and a 500–750 SKU product portfolio, building a credible 20-year business forecast required disciplined assumptions about demand growth, production yields, scrap rates, labor productivity, inventory turns, and distribution costs, all without the benefit of real plant data. The financial model had to be rigorous enough to withstand board-level scrutiny while remaining honest about the inherent uncertainty of a greenfield projection.

THE STRATEGY

As Senior Principal Engineer and Program Manager, I led the full scope of the assessment, integrating technical, operational, and financial workstreams into a single coherent deliverable for executive and board review.

Facility & Process Architecture

The facility layout was designed around five production processes, each mapped for Phase 1 operations and future expansion. Process flow, WIP staging areas, raw material storage, finished goods inventory, maintenance, tooling repair, and office space were all incorporated into the layout plan. Critically, the layout was engineered so that each scaling step, adding lines, automating processes, expanding capacity, could be executed without disrupting active production.

Phased Automation Strategy

Rather than committing to full automation on day one, the plan defined a four-stage production build-out tied to volume milestones:

Phase	Volume Target	FG Press	Hollow Door Assembly	PU Fill / Trim
Phase 1 — Launch	Initial ramp	1 press, manual layup (45% capacity)	1 assembly line	1 manual PU fill line, 1 trim line
Phase 2	Volume growth	1 press, manual layup	2nd hollow door line added	PU fill automated
Phase 3 — 300K/yr	300,000 doors/yr	Press automated (100% capacity)	3rd & 4th hollow door lines	Expanded PU fill process
Phase 4 — 600K/yr	600,000 doors/yr	2nd automated press	4 additional hollow door lines	2nd automated PU fill, 2nd trim line

This approach allowed the business to launch with lower capital exposure, generate cash flow, and fund automation upgrades as volume and revenue justified the investment.

Equipment & Supplier Selection

Five critical supplier partnerships were identified and evaluated across raw materials (fiberglass mat, PU foam systems, wood components), capital equipment (1,200-ton fiberglass presses, PU filling and metering systems, assembly stations, trimming and sizing saws), and materials handling and conveyance systems. Supplier selection criteria were developed to support both Phase 1 requirements and long-term scalability.

Business Opportunity Modeling

The financial model encompassed the full business picture: manufacturing labor and headcount by phase, raw material inventory requirements, scrap rates, distribution planning, finished goods inventory levels, and product lead times based on the plant's operating cycle. Sales forecasts were built out at 5-, 10-, and 20-year horizons with SKU-level detail across the 500–750 product range.

THE RESULT

The engagement delivered a complete, board-ready greenfield opportunity assessment — a rigorous blueprint covering every dimension of what it would take to build and operate a world-class fiberglass door manufacturing facility at scale.

The depth of the analysis produced an unexpected but highly valuable outcome: the financial modeling made clear that acquiring an existing manufacturer offered a significantly stronger investment profile than building from scratch. A greenfield build would have required the full \$80M capital outlay before generating a single dollar of revenue, a multi-year cash flow gap with substantial execution risk. An acquisition could compress that timeline dramatically while securing existing capacity, customers, and operational infrastructure.

Acting on the findings of the assessment, the company ultimately pursued and completed a strategic acquisition, reported at approximately \$500M, rather than proceeding with the greenfield build. The opportunity assessment that began as a manufacturing planning exercise became the analytical foundation for one of the company's most significant strategic decisions.

ACHIEVEMENTS

- Complete facility layout with all five production processes, WIP areas, maintenance, tooling repair, and office space
- Phased production scaling roadmap from launch through 600,000 doors per year
- Full equipment specifications across all process areas with automation trigger points defined
- Supplier evaluation and selection framework across five critical supply categories
- 20-year business forecast model covering SKUs, revenue, labor, materials, inventory, scrap, and distribution
- Site selection requirements document covering environmental, utility, power, and labor parameters
- Board-ready investment presentation delivered to CEO, Owner, and Board of Directors

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PRODUCTION?**

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