

Case Study: TPI Composites Optimizes Wind Blade Manufacturing



ABOUT TPI COMPOSITES

TPI composites is the largest US-based manufacturer of composite wind blades, serving global OEM customers since 1968. TPI maintains five advanced blade manufacturing facilities across China, Turkey, Mexico and the US. The company opened the Taicang Port wind blade manufacturing facility in 2007 and the Taicang City facility for manufacturing precision molding and assembly systems for blade production in 2014. TPI's China facilities can cost-effectively manufacture and deliver wind blades across the entire Asia Pacific region, as well as Europe or the Americas.

THE CHALLENGE

At its China facilities, TPI manufactures large wind blades, using extremely large raw material rolls of 200m in length (656 ft.). Since the blades are immense, the factory uses several fiberglass rolls to make a single blade, while each blade is composed of 700 - 1,000 pieces.

Material cost has a significant impact on the total cost of production leading TPI to continuously seek ways to improve material utilization.

Additionally, creating the cut plans is done manually, taking two to three days per new blade design, which could be further improved.

This manual process was prone to human errors such as overlaps, missing pieces, over cuts and alike. It was heavily dependent on the professional experience of the specific engineer assigned to the project, therefore in some cases led to material waste, errors and production delays. Consequently, TPI was subject to production 'rate up - cost down' pressures and decided to make all efforts to improve material utilization and automate its production processes.



Solution Benefits

- Material savings of 3-4%
- Faster time-to-market
- Increased staff efficiency
- Automated & optimized cut plans
- Improved manufacturing yield and ROI
- Reduced waste
- Full digital part traceability



PLATAINE'S SOLUTION FOR CUT PLANS OPTIMIZATION & AUTOMATION

TPI partnered with Plataine to deploy a manufacturing optimization solution that would dramatically improve their cut plans as well as their manufacturing process as a whole, while easily integrating with their existing systems.

Plataine's professional services team worked alongside TPI's teams to implement the project in just two weeks as the Plataine solution simply required TPI's CAD files, material information and their business & production preferences and constraints, to fully operate.

With Plataine's solution, TPI is now able to enhance all manufacturing processes, taking into account relevant production parameters in real-time, while automating and optimizing the cutting and production processes of wind blades. TPI now use Plataine's solution for automated and optimized cut plans or nesting of new blades and repairs for existing blades.

Fully automating these processes has resulted in significantly faster time-to-market for new designs and repairs, eliminated associated human errors, while freeing-up TPI's skilled engineers to work on additional projects. Overall, TPI has achieved 3 – 4% savings in raw material while reducing time-to-market for new blade designs.

Plataine's algorithms draw on the firm's deep expertise in Artificial Intelligence and the advanced manufacturing sector. The software's artificial intelligence (AI) capabilities can achieve the optimal balance between material savings and production floor constraints. Plataine's solution is designed to easily integrate with any existing IT system, enabling rapid deployment and quick return-on-investment for wind blade manufacturers.

"We were looking to reduce material waste and speed up response time (time-to-market) for new designs and repairs. Partnering with Plataine allowed us to achieve our goals in record time. Plataine's Manufacturing Optimization solution provides us with significant material and time savings and offers fast return on investment."

– Mr. Andy Wang, TPI's Chief Technology Officer for the Asia Pacific Region

ABOUT PLATAINE: Plataine is the leading provider of Industrial IoT and AI-based optimization solutions for advanced manufacturing. Plataine's solutions provide Material & Asset Traceability and Digital Assistants that empower manufacturers to make optimized decisions in real-time, every time. Plataine's patent-protected technologies are used by top-tier manufactures worldwide including Airbus, GE Aviation, General Atomics, Hexcel, IAI, TPI and Steelcase. Plataine partners with Siemens PLM, GE Digital, McKinsey & Company and Google Cloud to further promote Industrial IoT in manufacturing worldwide.