

Nikel Precision Group Adopts Datanomix and Caron Engineering to Optimize Machining and Accelerate Production Performance



LOCATION:
40,000 sq. ft. facility in Saco, ME

CHALLENGE:
Finding the right technology to help offset labor shortages and optimize production

SOLUTION:

- Datanomix delivers deep insights into real-time performance without operator input
- Smart TVs on the shop floor and in the management suite provide a common window into what's happening on the floor right now
- Caron Engineering TMAC systems optimize tool performance and increase part quality

RESULTS:

- Machine operators and other personnel are motivated by the Datanomix production scores displayed on smart TVs on the floor
- Datanomix highlights efficiency gaps in production to allow Nikel to quickly build out a plan to address them
- With Caron TMAC, Nikel shortens cycle times, improves part quality, and decreases tool wear

After years of searching, Nikel selects data-driven partners that fully understand their manufacturing processes

Nikel Precision Group, formerly Precision Manufacturing Solutions Inc. (PMSI), is a comprehensive engineering and contract manufacturing center of excellence headquartered in Saco, Maine. The company produces mission-critical components and assemblies for the Aerospace, Defense, Industrial, and Medical markets, with its 100 employees focused on delivering high-quality, engineered parts critical to the proper function of complex end products.

Jamie Bell is the vice president of operations at Nikel Precision Group, and has been involved in the manufacturing space for years. "I started out at Atlantic Precision Products as a machinist back in 1984, and worked my way up to plant manager and engineering manager. In 2003, a group of us started PMSI and I was focused on engineering. Ever since, I've been looking at ways to use technology to help improve operations and efficiency across our factory."

Using Technology to Compete

Like many manufacturers, Nikel Precision has been unable to hire as quickly as they would like. To offset personnel shortages, Nikel has embraced automation solutions and production intelligence technology. With a focus on increasing unattended machining hours and operator efficiency, Nikel has purchased advanced machinery, including some of the latest five axis milling machines.

"As we've grown, and the complexity of the parts we produce has increased, we've focused on technology as a way to expand our capabilities to meet customer demands," said Jamie. "Today's CNC

machines have the intelligence and advanced tooling capabilities to manufacture complex parts to exacting specifications, and this precision helps Nikel differentiate itself for the types of companies we manufacture parts for. The bar is set high on every dimension and aspect of production performance and component quality."

But technology innovation doesn't end with new CNC machines. Nikel has also implemented solutions that optimize tool performance to improve quality, as well as production intelligence systems that provide real-time insights into the performance of the factory. "To fully realize the potential of our advanced CNC machines, we've been working with Caron Engineering and Datanomix to help us increase the quality and speed at which we machine parts."

According to Jamie, "By welcoming outside expertise in areas where technology can offer measurable and significant increases in productivity when done right, we've been able to deliver positive business outcomes for the company. These tools have become core building blocks in how we manage production, and ultimately, our facilities."

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Problem Solving in Real Time

"I've been looking at machine monitoring software for four or five years, and what I didn't like about most of the solutions is that they were canned products. I never felt that once I made the purchase, I would be able to make it look or act the way I wanted. When I talked with Greg (McHale, CTO and co-founder of Datanomix), it was obvious they had been working with manufacturers like us to develop a product that would be extremely impactful. And they were more than willing to spend the time to understand our requirements and deliver a solution that worked for us."



Nikel implemented Datanomix in August of 2020 after a short trial of the platform. Offering real-time production intelligence and deep insights into ongoing factory trends, Datanomix met a lot of Nikel's criteria for production monitoring solutions. "Since Datanomix requires no operator input to deliver insights in real time, the platform supports our strategic initiatives for automation and unattended operation. We get insights automatically."

Datanomix analyzes data directly from CNC machines in real time as parts are produced. The platform quickly develops a benchmark that reflects what good production should look like—it's a bit of a stretch, but achievable because the system has seen it done. Every run of that part is compared to the benchmark, and the system assigns a letter grade for how production stacks up. Jobs scoring lower than average get more attention from senior operators, supervisors, and sometimes engineering. It becomes the guidance system for real-time problem solving, identifies opportunities for operator training, and offers a wide range of contextual information about the part being manufactured.

Visual Cues Level the Playing Field

By showing Datanomix production dashboards on smart TVs around the shop floor, everyone is on the same page with what's happening in the factory right now. "For the guys running the machines, it's motivational to see your production score and know where you are against the Datanomix benchmark. Everyone sees when the first part comes off the machine, what the current production status is, where we're at with cycle times and parts, and which jobs need attention. It brings the team together."

Everyone at Nikel reports their time every day, and this information is used to cost jobs. But when running multiple jobs on a machine, with different parts across shifts and multiple parts running on unattended shifts, it's not always easy to determine which jobs are driving costs. Datanomix lets Nikel look at a variety of metrics, including spindle utilization and cycle times, for every part to help with job costing. They also get a better view of how to best utilize each machine across jobs and shifts to maximize productivity and profitability with Datanomix.

"One of the new features in Datanomix I want to explore fully is the updated Quote Calibration report. On a per-job basis, Datanomix shows me how our jobs stack up against our shop rate, giving us the actual cost per part as well as the potential revenue we can recapture if we optimize our cycle times to be closer to the benchmark. The report highlights parts that are hitting our marks and where we should focus to improve profitability."

—Jamie Bell, Vice President of Operations, Nikel Precision

Optimizing Performance in Production

Looking forward, Jamie is excited about the opportunities to turn more of the data from their systems into actionable insights, especially around the convergence of people and machines. "Datanomix helps us focus on the things that need focus. Today, I can look at the dashboard, and you see that machine A is running at 68% and machine B is running at 98%, and they're both running the same part. What quickly becomes obvious is machine utilization and efficiency has a lot to do with the guy running the machine. With Datanomix, we can identify these gaps and work out a plan to address them, including training on best practices."

The rich repository of data saved from daily operations is used by Datanomix to analyze long-term trends. All of the metrics - cutting hours, production hours, setup time, cutting time, utilization, cycle time, true machine cost, and setup cost are calculated on a per-machine and per-job basis to provide a complete picture of how each job runs and areas for improvement. In addition, an Alarms Pareto report allows Nikel to analyze the alarms history for all of their machines to help them diagnose what is happening and to predict maintenance needs.

To help improve part quality and optimize tool performance, Nikel has been working with Caron Engineering, using their adaptive tool monitoring solution TMAC. "We use TMAC on our five-axis milling work centers. We've found that CAM software is not very efficient when it comes to stock removal—there's a lot of air cut time. TMAC allows us to program a maximum feed rate or maximum horsepower draw so when you're exiting a cut and going into an air cut, TMAC increases the feed rate, which reduces the air cut time and shortens the cycle time." Nikel also uses TMAC to watch horsepower to monitor spindle wear for proactive tool maintenance.

Looking Ahead

Looking towards the future, Jamie would like to see if he can stretch technology to integrate their CMM output into adjustments on their CNC machines. "It would be great to have the ability to adjust machines based on our CMM results. So for example, if a dimension is off nominal, you could use advanced analytics to decide if it's a positional issue or a tool adjustment issue. Basically, create a closed-loop for part production and quality that would help us further automate to alleviate some of our hiring issues."

With Caron and Datanomix working together, Jamie sees a lot of synergies that will help advance the use of data in his operations. "As the data from Caron systems is integrated into the Datanomix platform, we now have a single source for data from tools, machines, operators, and finally, the whole factory. The more we can consolidate and analyze information across our technology stack, the better we'll be able to serve our customers."

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"As a customer of both Caron and Datanomix, Nikel Precision Group is getting tremendous value from the real-time data driven by each of their solutions. We're excited about the potential enabled by the depth of experience in manufacturing and data science of these two teams."

—Jamie Bell, Vice President of Operations, Nikel Precision

Find Out How Datanomix can Power Your Factory

Request a live demonstration by contacting a Datanomix sales representative at sales@datanomix.io

