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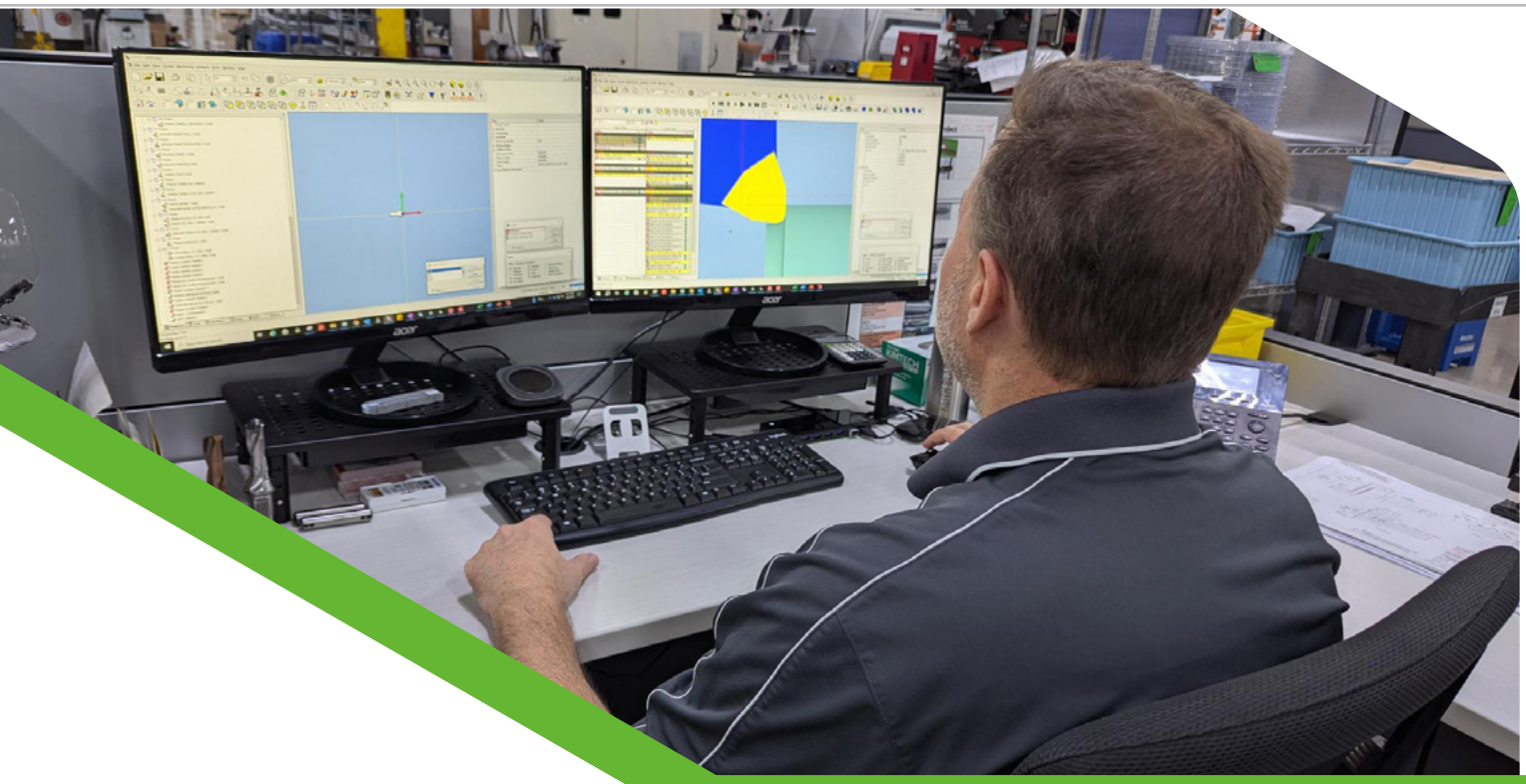
Transforming Complex Machining into Seamless Success

How C&S Machine leveraged ESPRIT Swiss Turn to achieve edit-free programming and operational excellence

The situation

C&S Machine stands as a beacon of precision manufacturing, a family-owned and professionally managed enterprise based in Niles, Michigan. Established in 1966, they have been at the forefront of producing ultra-precision components for diverse industries, including aerospace, medical, firearm, and power generation.

With a team of 160 skilled professionals operating out of a 120,000 sq. ft state-of-the-art facility, C&S Machine has built a reputation for saying “yes” to the most complex components, delivering world-class customer service. Their commitment to precision machining is critical to meeting the demanding specifications and tolerances required by their global customer base in variety of industries.



The opportunity

C&S Machine, known for their precision and expertise in Swiss Turn operations, recognized an opportunity to elevate their programming efficiency. While their team delivered exceptional results, the programming process required considerable manual input—common in the industry, which introduced time-consuming steps and limited scalability. Like many manufacturers operating in high-precision environments, they sought a smarter approach to reduce cycle times, accelerate delivery, and maintain their commitment to quality. Partnering with Hexagon opened the door to time-saving, edit-free programming, helping them unlock even greater potential.

The solution

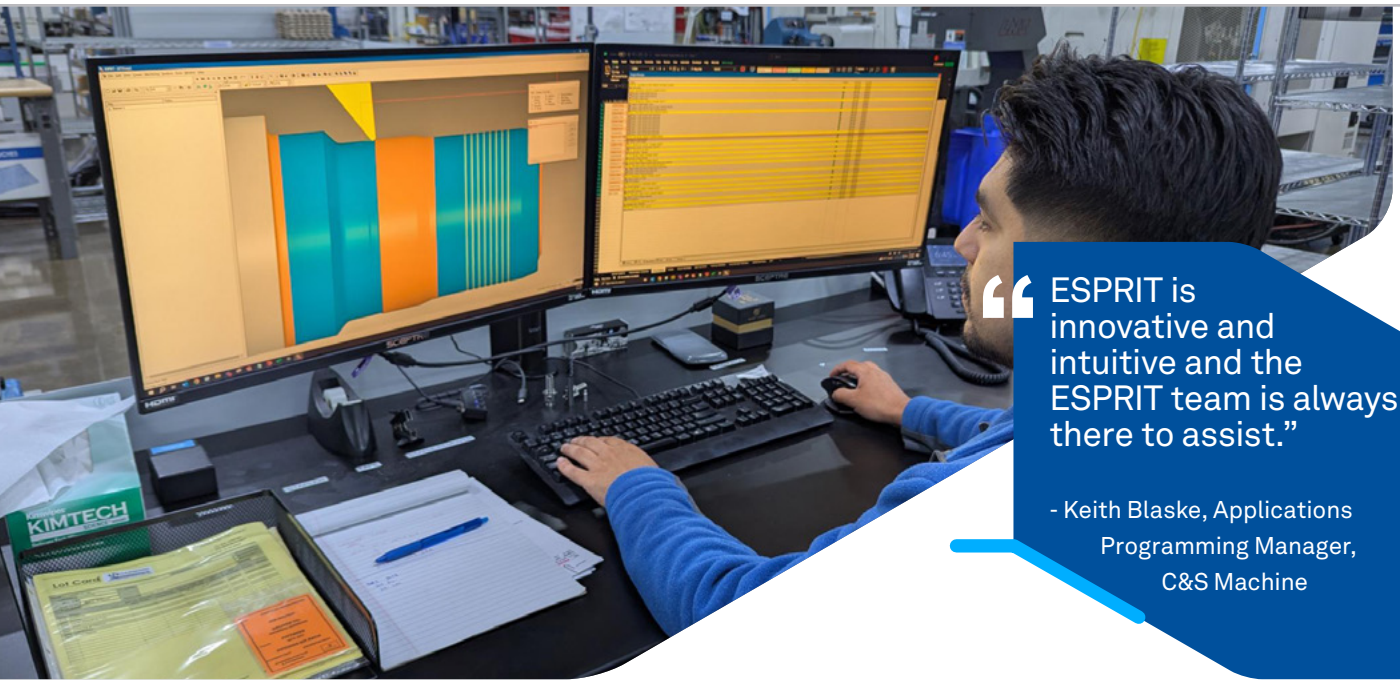
C&S Machine's adoption of ESPRIT Swiss Turn revolutionized their approach to programming and machining, addressing longstanding challenges and unlocking new efficiencies. With ESPRIT, C&S Machine transitioned from labor-intensive manual programming to a streamlined, edit-free process that significantly reduced time and effort. The ability to program offline, as opposed to programming directly on the machine or line-by-line on a computer, was a game changer. This shift allowed the team to produce complex, multi-channel programs, such as those for Citizen M32 machines, in a fraction of the time it previously took. Moreover, this process offered unparalleled visibility into tool paths, cuts, and machining strategies, enabling quick and intuitive adjustments.

One of the standout capabilities of ESPRIT was its simulation feature, which allowed the team to visually assess and refine machining processes before production. This proactive approach ensured that programs were accurate and optimized from the start, minimizing the need for post-production adjustments. When issues arose, such as tooling changes or print updates, ESPRIT's intuitive interface made it easy to incorporate modifications, keeping the programming files up-to-date and aligned with production needs.

Another critical advantage was the ability to perform intricate deburring directly on the machine, a task that was previously done manually. This capability not only improved operator efficiency but also elevated the quality and consistency of the finished parts. Operators could now focus more on inspection and other critical aspects of production, rather than spending time on manual deburring.

The flexibility of ESPRIT's interface also stood out. The team appreciated the ability to open multiple instances of the software simultaneously, which allowed them to reference or compare programs for similar parts. This capability streamlined the programming of families of parts and facilitated rapid adjustments to parts already in production without disrupting ongoing work.

Beyond the software itself, C&S Machine highlighted the exceptional support provided by the Hexagon team. Whether resolving post-processing issues or addressing complex programming challenges, the support team was consistently responsive and effective. This level of collaboration ensured that ESPRIT's post-processors, which are critical for generating accurate code for complex machines, were always fine-tuned to meet every customer needs.



> “ESPRIT is innovative and intuitive and the ESPRIT team is always there to assist.”
>
> - Keith Blaske, Applications Programming Manager, C&S Machine

The results

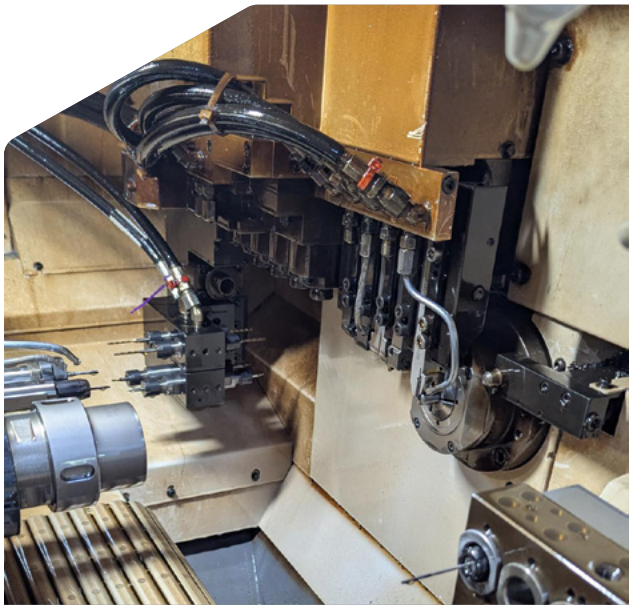
The partnership with Hexagon and the implementation of ESPRIT Swiss Turn yielded impressive results for C&S Machine. They experienced a substantial reduction in cycle times and setup times, leading to faster production and delivery. The accuracy of ESPRIT’s programs minimized the need for manual edits, ensuring a smoother and more reliable manufacturing process.

Additionally, the capability to perform complex deburring with the machine improved operator efficiency and product quality. These quantifiable metrics underscore the transformative impact of ESPRIT on C&S Machine’s operations, positioning them as a leader in precision manufacturing.

> “As Hexagon grows and makes changes, we know they are here to help along the way. We are also very fast-paced & growing, so this makes this journey easier.”
>
> - Keith Blaske, Applications Programming Manager, C&S Machine

Conclusion

C&S Machine’s success story exemplifies the power of a strategic partnership with Hexagon. By leveraging ESPRIT’s advanced capabilities, they overcame bottlenecks and achieved improvements in efficiency and precision. Other teams can replicate these results by embracing Hexagon’s innovative solutions, fostering a collaborative relationship that drives continuous improvement and growth. The true greatness of a Hexagon partnership lies in its ability to empower customers, making them heroes in their own stories.



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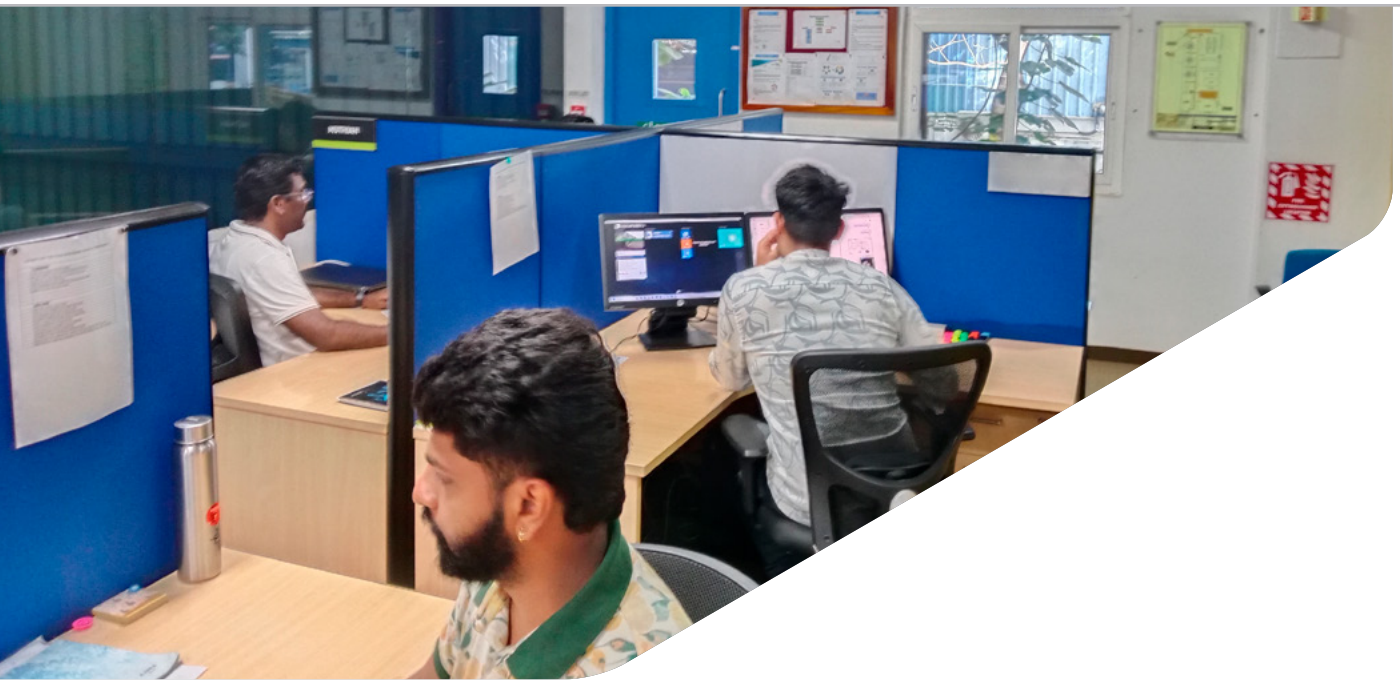
Scaling with confidence: John Crane's journey to global programming automation

The challenge: A need for standardization

John Crane, a global leader in mechanical sealing solutions, was looking to enhance consistency and efficiency across its five manufacturing sites. To support its ongoing growth and ensure repeatability across regions, the company turned to Hexagon for help standardizing programming and machining practices.

Historically, each site tailored its programming techniques to local needs. But as complexity increased and precision remained critical—especially for small-batch, high-value parts—John Crane recognized the need for a standardized, scalable system supported by CAD/CAM software.



John Crane's global programming team 1

The solution: Implementing EDGECAM for standardized programming

To address these challenges, John Crane adopted Hexagon's EDGECAM to automate programming, ensuring consistency across sites and reducing reliance on manual programming methods.

Key changes included:

• Transitioning to CAD/CAM-based programming instead of macro variable or conversational programming.

• Standardizing tooling, machine specifications, and processes across all manufacturing sites.

• Implementing automatic feature recognition, allowing toolpaths to be generated based on solid models.

• Consolidating EDGECAM licenses globally, enabling centralized programming teams in India and Mexico.

Alongside this software implementation, the company invested in 78 new machines with identical specifications. This ensured that a program created in one location would run seamlessly anywhere in the world—a foundational step in building a globally unified ecosystem.

"It wasn't enough to just change our programming approach—we needed the entire ecosystem, from tooling to machine setup, to be uniform," said Brian Bains, Global Manufacturing Engineering Manager.

The Results: Increased efficiency, improved quality, and workforce optimization

By implementing EDGECAM and global standardization, John Crane achieved measurable gains in efficiency, quality, and workforce flexibility.

Reducing setup time and increasing machine utilization
With standardized tooling and programming, setup times dropped by 40 percent, allowing operators to move through jobs faster and with greater confidence. Overall Equipment Effectiveness (OEE) improved by 8 percent, thanks to a shift from individual-led processes to a structured, repeatable system that minimized downtime.

Faster programming and consistent quality
Programming time per part decreased from three to four hours to just one hour. Automation not only improved speed but also reduced the risk of human error. Built-in deburring operations eliminated the need for manual finishing, helping maintain consistent part quality across locations.

"What once took hours can now be completed in a fraction of the time," noted Simon Blakey, Global CAM Lead.

Beyond speed, automation improved accuracy, reducing the need for manual rework. "Machinists love the new system because they no longer have to spend extra time manually deburring features—it's all done automatically," said said Joshua Reed, Manufacturing Engineer at John Crane. Built-in deburring operations further streamlined production, eliminating finishing steps and ensuring consistent quality.

Optimizing workforce and reducing training time

With a more structured, automated programming system, John Crane was able to reduce new operator training from 12 weeks to six to eight weeks. “The new structure allows us to tailor operator roles more effectively,” said Bains. “It’s opened the door to onboarding new talent and focusing expert skills where they add the most value.”

Additionally, the company shifted from relying on individual machinists for programming to centralized programming teams. “We set up dedicated programming teams in India and Mexico,” said Bains. “This way, instead of 200 different programmers at various sites, we have specialized teams ensuring consistency across the board.”

Automating further with fully automated programming

Building on these improvements, John Crane is now working toward further automation by integrating EDGECAM with its MRP and SAP systems to create a fully automated programming workflow.

“Our vision is to generate programs as soon as a drawing is released—whether there’s an order for it or not,” said Bains. “If engineering has created a drawing, there’s going to be demand for it eventually, so why wait? Having programs ready in advance eliminates unnecessary lead time.”

Future automation goals include:

• Automatically generating programs upon drawing release, reducing programming delays.

• Moving toward fully autonomous, lights-out machining, minimizing human intervention.

• Expanding robotic material loading/unloading to further streamline operations. “

The closer we get to fully automated programming, the more we reduce manual work in the production cycle,” said Reed. “Every second we save in programming and machining translates into shorter lead times and better service for our customers.”

With EDGECAM driving automation, John Crane is setting the foundation for the next generation of smart manufacturing, ensuring efficiency, quality, and scalability across its global operations.

John Crane’s global programming team 2

Machine Shop

EDGECAM is a market-leading computer aided manufacturing (CAM) system for NC part programming.

Hexagon is the global leader in measurement technologies. We provide the confidence that vital industries rely on to build, navigate, and innovate. From microns to Mars, our solutions ensure productivity, quality, and sustainability in everything from manufacturing and construction to mining and autonomous systems.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 24,800 employees in 50 countries and net sales of approximately 5.4bn EUR. Learn more at hexagon.com.