



Customer Interview: Simulation and Optimization



Recognized and well-respected nationwide, Enmark is a leader in large capacity, close tolerance manufacturing of highly complex machine tool parts. The foundation of its expertise is built on its origins as a gage and fixture company over 70 years ago. That precision-focused, gaging mindset helped the Enmark family grow the company and expand into precision machining. Today, Enmark continues to uphold a legacy of excellence, delivering unparalleled precision and quality in every project undertaken.
www.Enmarktool.com

Interviewee:

Chris Micolaczyk

5-axis Machinist and Programmer

Your newest investments are some high-end 5-axis machines. How important is a good CAM-System and postprocessing technology to you and why did you choose hyperMILL® and VIRTUAL Machining?

At Enmark Tool, having top-tier CAM and postprocessing technology is crucial for ensuring our machining centers operate efficiently, accurately, and safely. Choosing hyperMILL® was an easy decision for us. We sought a company that offered powerful, user-friendly 5-axis CAM software and demonstrated a commitment to continuous innovation. A significant factor in our choice was hyperMILL®'s proven, functional virtual machine and post specifically for the 5-axis machine we purchased.

Effective simulation technology is crucial for your machining processes. What differences have you observed with our VIRTUAL Machining package compared to other solutions you have used?

Enmark specializes in unique, one-off, tight tolerance components rather than machining multiple pieces. The VIRTUAL Machine significantly aids in setups, programming, and quoting. It allows us to swiftly import fixture items or vises, calculate tool paths, and make adjustments without restarting the entire process. Other systems we evaluated required a complete restart for even simple changes, making the Virtual Machine an invaluable asset for our operations.

The VIRTUAL Machine is crucial for parts that push the machine's working envelope. It eliminates guesswork for setups and tool lengths, making it easier to validate complex parts. By knowing exactly how the machine will perform before running the job, operators can avoid surprises and ensure a more efficient process.

Trust in hyperMILL® VIRTUAL Machine was quickly established due to its accurate simulation of machine movements. For a

unique part that requires the use of a 90° head in hard-to-reach areas, hyperMILL® developed a VIRTUAL Machine tailored to include our aftermarket head. Programming with the 90° head, once complex, is now streamlined, as hyperMILL®'s postprocessor utilizes all of our machine manufacturer's cycles without needing manual NC code adjustments. This reliability allows us to confidently leave the machine running unattended during initial runs, knowing the NC code has been thoroughly validated by the VIRTUAL Machine.

On your Hermle C650, you often work with large parts that push the machine's limits. How does our Optimizer technology assist you in addressing the challenges associated with machining these large components?

Every shop maximizes their machine's capabilities, often pushing it to its limits. Our first job required working at the maximum table limits, with the back of the part extending beyond the Y-axis travel limits. The Optimizer technology enabled us to complete the outside radius and top face of the part, which were beyond the machine's limits, all within a single program. It also allowed us to drill holes that were outside of the Y axis limit by automatically adjusting the table rotation. Without hyperMILL®'s NC Optimizer and VIRTUAL Machine technology, programming and machining this part would have been significantly more time-consuming.

With your experience in large part machining and the use of hyperMILL® and VIRTUAL Machining, how have these tools enhanced your throughput and affected your company's operations?

I believe hyperMILL® and VIRTUAL Machine have significantly boosted our confidence in programming and operating our new 5-axis machine. The proven integration of hyperMILL® with the Hermle C650 allowed



We push machining to the limit

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us to be fully operational from day one. Had we chosen different software, it likely would have taken much longer to develop a working post for the machine, and we would have had to rely on third-party software for collision checking.

hyperMILL® has greatly cut our programming and machining times. Tasks that once took hours to program can now be completed in just 20 minutes. Its intuitive tool paths enable us to achieve greater efficiency with less effort, consolidating what previously required ten separate tool paths into a single one.

Additionally, machine cycle times are reduced because the tool paths are more precisely engaged with the part, minimizing air cutting. The smoother tool paths also allow us to increase cutting feed rates, further enhancing productivity.

The optimizer handles solution selection and links operations automatically. How has this technology's quality and functionality impacted your work, and what benefits have you experienced?

The optimizer has been crucial for several of our parts. As mentioned earlier, some tool paths would be impossible without its technology. It simplifies the linking of programs, making the process much more efficient. I also appreciate the various options for 5-axis rotations, which provide

safer alternatives for setups with limited collision clearance areas, reducing the risk of collisions.

Having transitioned to 5-axis simultaneous machining with your new machines and *hyperMILL®*, what has been your experience so far, and are there any specific aspects you'd like to highlight?

The experience has been great so far. Enmark's history has primarily been rooted in traditional 2D machining – focusing on flatness, parallelism, concentricity, and squareness – so transitioning to 5-axis machining has been both a technological and cultural shift for our team. This change has expanded our capability to quote a wider range of projects with confidence in our ability to produce the necessary tool paths.

We were intrigued by 5-axis barrel cutting when we first saw it online. We thought it was a great concept that was out of the question for Enmark as we don't machine molds. However, after exploring it, we found several valuable applications for this technology in our manufacturing process, leading to up to a 60% reduction in cycle times for certain applications. With *hyperMILL®*'s advanced simulation technology, we have strong confidence in the accuracy and reliability of its 5-axis capabilities. ■

Visit our website to learn more about all features and benefits of *hyperMILL®* VIRTUAL Machining.



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