



## Success Story

# 5-Axis Competitive Advantage with *hyperMILL*®

In 2004 in San Diego, California two experienced and motivated entrepreneurs, Steve Grangetto and Chris Taylor co-founded 5th Axis, Inc. As the company’s name implies, they recognized that 5-axis machining would...

... give their new company a competitive advantage and entry into demanding markets like Aerospace, Medical, and other challenging high-tech industries.

Today, they not only offer complex precision machining to meet a broad range of custom requirements, but have also evolved to manufacture their own line of 5-axis workholding products. The workholding line encompasses a wide range of vises, fixtures and adapters that complement a broad spectrum of CNC machines. “There weren’t many good 5-axis workholding fixtures available when we started.” Taylor said, “Out of necessity our team started designing and building our own fixtures. Those fixtures and workholding products matured, and we began selling them around five years ago. Now this product line is a substantial part of our business.”

Taylor boils down their company’s philosophy into one sentence: “From day one, 5thAxis’ strategy has been to take advantage of the most advanced software, equipment and technologies available.”

Today, their bustling shop floor is equipped with the “best of the best” 3- and 5-axis high-speed machining centers from Germany, Switzerland and Japan. To further sup-

port the company’s philosophy to use the most advanced software, all of the machines are programmed with *hyperMILL*® CAM software from OPEN MIND. But it wasn’t always this way.

### Smart Growth

Business grew dramatically over their first three years. Their first machine was a HAAS. In order to meet the growing demand for complex 5-axis machining, 5thAxis began

Advanced 3- and 5-axis machining centers from Germany, Switzerland and Japan are all programmed with *hyperMILL*® from OPEN MIND.



### About 5th Axis

5thAxis, Inc. was initially founded in 2004 as a CNC job shop with one machine. Recognizing the opportunity for growth in 5-axis machining, 5thAxis made it their specialty. They filled a void for competent CNC machine shops that could handle complex and ever evolving manufacturing challenges. 5thAxis spent years of research with some of the best engineering and machinist talent to develop manufacturing processes and patented tooling systems that allow them to stay efficient, competitive and cost effective successfully serving several industries including aerospace, medical and other challenging high-tech industries.

> [www.fifth-axis.com](http://www.fifth-axis.com)

“*hyperMILL*® MAXX Machining roughing module extends tool life by maintaining a constant chip load. The bottom-line is, using *hyperMILL*® MAXX Machining results in super-efficient and fast tool paths.”

Chris Taylor, co-owner  
5th Axis, Inc.



purchasing new high-speed 5-axis equipment including the superfast 42,000 rpm Mikron HSM 400U's, followed by Hermle C 30 U's, Grob G350 mills and two Okuma MB-5000H horizontal machining centers.

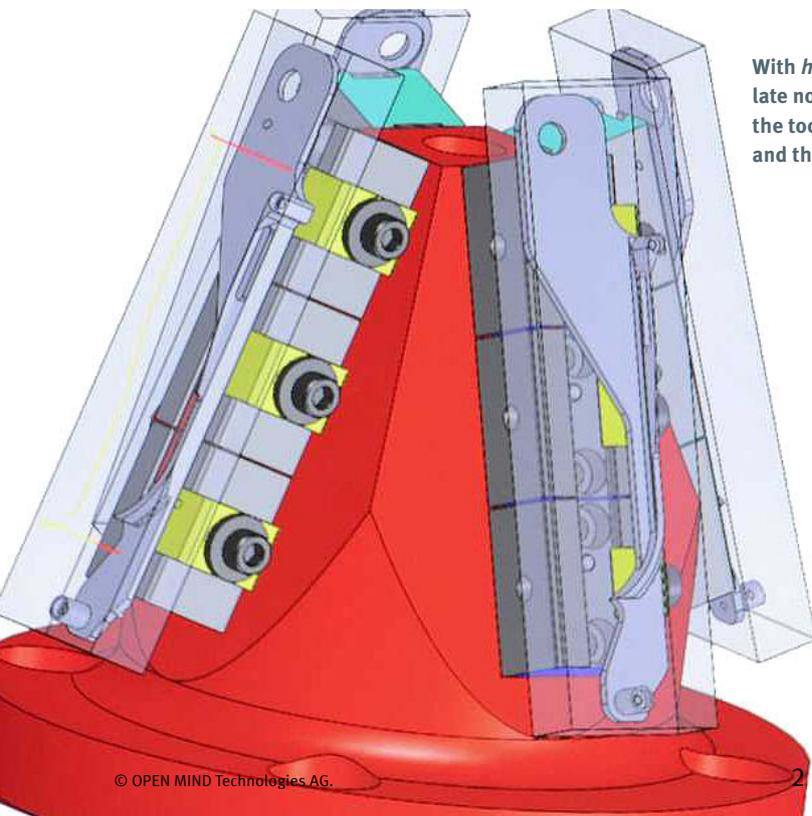
Once Grangetto and Taylor began to dig into programming the machines, they discovered their existing CAM software had huge shortcomings. They were faced with unexpected machining collisions and couldn't fully utilize the speed, capabilities and potential of their new high-end machines.

Grangetto and Taylor assembled some of their best talent to evaluate new CAM software for their high-end machining centers. Their team consulted with 5-axis machine manufacturers to determine what CAM software they were using to program 5-axis demonstrations. Without exception every single 5-axis demo, hands down, was programmed in *hyperMILL*®. Encouraged by this feedback, they decided to experience *hyperMILL*® first hand. Taylor recounts that, “We demo'ed *hyperMILL*® on a complicated 5-axis part that was giving us fits, and were very impressed by the efficient tool paths and the reliable collision avoidance. The demo clinched the deal and we've been successful using *hyperMILL*® ever since.”

Grangetto added: “Our company goal was to find a CAM software solution that allowed us to take advantage of the benefits of high-speed machining. The results have been faster run times, better surface finishes and overall better part quality. Over the years we found that *hyperMILL*® has fit our company's strategy perfectly.”

5th Axis, Inc. takes advantage of its high speed 5-axis machining centers programmed with *hyperMILL*® to manufacture a wide range of precision parts including turbine impellers, that cannot be made efficiently any other way. This machine-software pairing delivers part-precision and time-savings benefits which include:

- 5-axis machining greatly improves part precision by eliminating alignment errors that are introduced in standard machining when a part is removed and re-fixtured in another orientation.
- 5-axis machining is extremely time efficient because most or all of the work is performed in a single setup which eliminates delays while waiting for an operator to unload, reload, and reposition the part.



With *hyperMILL*® you're able to simulate not only the part in its fixture, but the tool, the tool holder, the spindle and the entire machine envelope.

Production component programmed with *hyperMILL*®



Jesse Norton, 5th Axis, Inc. Director of Manufacturing and Senior Programmer has been programming with *hyperMILL*® for seven years. Norton pointed out that *hyperMILL*® is able to simulate the part in his fixture, in addition to the tool, the tool holder, the spindle and the entire machine envelope itself. “I can step through the tool path and watch it remove material, verifying that it clears the machine and there isn’t going to be any collision. To check clearances, this is an invaluable time saver since I don’t have to walk out to the shop floor and look inside a machine which has coolant flowing,” said Norton.

#### More Speed and Efficiency

*hyperMILL*® CAM software from OPEN MIND also includes an exceptionally productive module called MAXX Machining. By careful control of material removal and use of smooth trochoidal tool path motion where possible, *hyperMILL*® MAXX Machining creates extremely efficient roughing tool paths. The *hyperMILL*® MAXX Machining roughing module extends tool life by maintaining a constant chip load, never overloading the cutter or wearing out tools prematurely. It allows feedrates to be set for the best cutting conditions, rather than the typical process of setting feedrates for the most challenging cut, such as a corner condition. Norton said, “We can use *hyperMILL*® MAXX Machining on materials from aluminum right up to hard materials such as Inconel because our high-speed machines are fast enough to keep up with the rapid tool path motion that is generated. The bottom-line is using *hyperMILL*® MAXX Machining results in super-efficient and fast tool paths.”

#### OPEN MIND Support – The Big Differentiator

Taylor said that, “*hyperMILL*® support is one of the things that really separates OPEN MIND from other CAM software vendors on the market. OPEN MIND takes complete ownership of post processor development, and that’s a really big deal, especially when 5-axis machining where an accurate post becomes extremely critical in avoiding crashes. The machine does exactly what we simulate on the computer screen.”



5-axis workholding fixtures are now a substantial part of 5th Axis’ business.

OPEN MIND postprocessors are developed as a core technology of the company, using internal experts. Postprocessors are customized and have configurable parameters to give the customer needed control for their particular environment. “We have the confidence to take on ever-more challenging jobs due to the combination of high quality tool paths and the advanced capabilities of the CAM software, the post processor support, plus having a team of extremely skilled technical support people on hand when we program very complex parts. With OPEN MIND’s help we never burn money getting stuck on a job. Their contribution has been a really big part of the growth of our business,” commented Taylor.

For Chris Taylor and Steve Grangetto, it is clear that *hyperMILL*® is the right choice for their business. They acknowledged, “*hyperMILL*® and our excellent working relationship with the OPEN MIND team has allowed us to make aggressive decisions that have helped us grow to where we are today!” ■

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#### About OPEN MIND Technologies AG

OPEN MIND is one of the world’s most sought-after developers of powerful CAM solutions for machine and controller-independent programming.

OPEN MIND develops optimized CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2.5D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC are efficiently built into the *hyperMILL*® CAM system. *hyperMILL*® provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

OPEN MIND strives to be the best and most innovative CAD/CAM manufacturer in the world, helping it become one of the top five in the CAM industry according to the NC Market Analysis Report 2017 compiled by CIMdata. The CAD/CAM solutions of OPEN MIND fulfil the highest demands in the automotive, tool and mold manufacturing, production machining, medical, job shops, energy and aerospace industries. OPEN MIND is represented in all key markets in Asia, Europe and America, and is a Mensch und Maschine company.



We push machining to the limit

[www.openmind-tech.com](http://www.openmind-tech.com)