Precision Machining Supplier for Space Missions Rejuvenates Its Manufacturing Processes with CAMWorks Solutions

TECMA Transitions to Digital Machining to Maintain its Competitive Edge

TECMA, a family-owned precision machining business, provides machining services for the aerospace and defense industries. They have provided parts for many historic U.S. space programs, from the 1st Apollo missions to the upcoming Artemis mission. To remain competitive and continue their growth, the company needed to transition from 2D to 3D programming capabilities. They found an excellent solution in CAMWorks, which enabled them to increase output, control costs, and position for the future.

For more than six decades, TECMA, Inc. has been providing precision machining services for the aerospace and defense industries. When Neil Armstrong descended the stairs of the Apollo 11 Lunar lander module, TECMA celebrated alongside the nation, knowing it had critical parts on the lander that ensured the astronauts safe return to earth. The pride of this accomplishment carried them through all six Apollo missions, all Space Shuttle missions and still motivates them today. Now, 53 years later, they are machining over 250 critical parts for the Artemis missions on the SLS Rocket and Orion Capsule, which will bring the first woman and man back to the Moon since 1972. The company has supplied parts for many U.S. defense contracts as well, and in recent years, has expanded into producing parts for carbon-negative energy systems. The company specializes in CNC and conventional precision machining for hard-to-manufacture, mission-critical components. For 64 years, they have built a reputation for quality workmanship, pristine finishes, and creative problem-solving.

TECMA, Inc. has provided precision machining services for several space missions, including Apollo 11 and the upcoming Artemis missions.

The company was founded by Fred Schwarz in 1957, alongside his partner Alfred Nohr. Schwarz led TECMA for more than 50 years until his daughter Sonia Susac took over ownership in 2012 after Schwarz's passing. Wanting to keep TECMA competitive, she recognized the need for the company to transition from 2D programming and manual machining to 3D digital production.

Sonia Susac – President of TECMA, Inc. – with a photo of her father, Fred Schwarz – founder of TECMA.

"My dad was old-school. He built the company by consistently delivering the precision components needed by aerospace and defense customers, utilizing his close personal ties with those customer's engineers," Susac explains. "When my father passed away and I took over management, I quickly realized that we needed to re-tool and modernize to continue to be successful. While TECMA had and still has a great reputation in the aerospace and defense industries, we needed to expand our customer base and update our compliance to NASA and Department of Defense requirements. Part of that was to obtain some important certifications—such as AS9100/ISO9001 Quality Management Systems and ITAR [International Traffic in Arms Regulations and Export Administration Regulations], and cybersecurity compliance—in order to remain competitive and grow."

When Susac took control of the company, it had only two CNC machines to nearly 20 manual machines. It also had a small employee base who each used different and outdated 2D programming programs. Investing in automated, state-of-the-art CNC machining centers with 5-axis machining capabilities as well as a software system to automate digital machining operations would enable the company to compete for new

THE CLIENT

Company: TECMA, Inc.

Headquarters: Sacramento, CA, USA

Industry: Complex, precision components and prototypes for customers in the aerospace, defense, energy exploration, transportation, arts, and medical industries

THE OBJECTIVE

Transition machining operations associated with the production of complex precision components and prototypes from manual to digital machining to increase productivity while controlling costs to remain competitive through more accurate estimating/quoting, improved quality, and lower levels of scrap/rework.

THE SOLUTION

Implement CAMWorks and CAMWorks VoluMill high-speed machining software to take advantage of the solutions' seamless integration with SOLIDWORKS 3D modeling software, feature-based recognition capabilities, machining simulation/estimating tools, and extensive knowledge database that captures and reuses best practices.

THE BENEFITS

- Rejuvenated and digitized manufacturing processes for precision machining company
- Reduced machine setup time and increased throughput substantially
- Improved quality, decreased scrap/rework
- Obtained critical quality/cybersecurity certifications for aerospace and defense work
- Initiated investment in training the future workforce

business. CAMWorks provided the solution that met TECMA's goals of modernizing, increasing efficiency, and improving quality.

"In 2012, I didn't want to see my father's legacy disappear or have his employees lose their jobs, so I decided to manage the company to supervise the transition from predominantly manual machining to machining parts in the digital world," Susac explains. "I reached out to my father's friends, colleagues, and customers, and learned that our future success was all about progressing and keeping up with technology. Through word of mouth, we eventually started working with GoEngineer, a reseller that supports CAMWorks® machining software. We dove into CAMWorks to support our newer capabilities and haven't looked back. During that time, I came to understand the passion that drove my father to never want to retire, and now I feel it too.

"We looked at many different CAM systems, but what really sold us on CAMWorks was the fact that the software uses the features from a SOLIDWORKS® CAD model, which is the Gold Standard we need. It provides automation of the programming of tool paths and the generation of G Code to run our machines."

Transitioning to 3D Digital Machining

Since transitioning to CAMWorks, the rejuvenated TECMA is able to bid on a wider range of parts while maintaining its flight-rated business. According to Production Manager Tirath Singh, the move to CAMWorks in conjunction with the installation of 3-axis, 4-axis, and 5-axis machining centers has allowed the company to boost efficiency and productivity while reaping a host of associated benefits.

After looking at several CAM solutions, TECMA chose CAMWorks to rejuvenate their manufacturing processes and remain competitive.

"With CAMWorks, our throughput has increased substantially. Now, it takes less time to set up a machine and we have much fewer jobs that need to be reworked. If there is a change to the model, the G code updates automatically," Singh points out. "Our communication is better—you can actually see the part, simulate the tool path, and see how it's set up—which means that there are fewer mistakes and less scrap. The CAMWorks VoluMill high-speed machining module lets us reduce stress on the spindles and end mills while accelerating machining, helping us to control costs while increasing throughput."

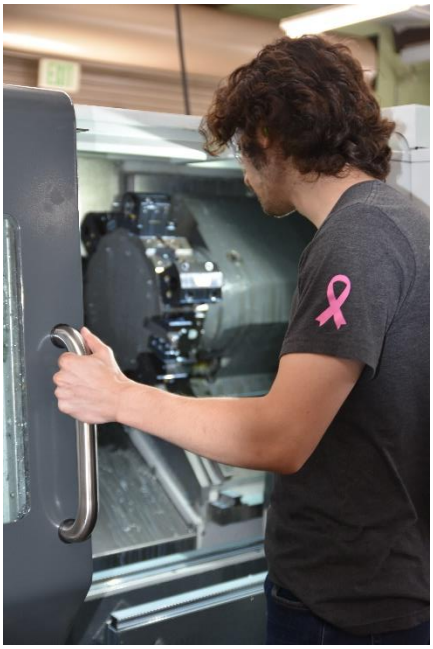
Starting from a Clean Slate to Increase Future Productivity

Tirath Singh – Production Manager at TECMA, Inc.

Another reason that TECMA chose CAMWorks is the software's extensive knowledge database. This helped TECMA start digitizing their machining processes. With CAMWorks, they can embed their experience and expertise for difficult machining operations in the software's technology database for future use. "We don't typically run the same machining job over and over," Singh notes. "Nevertheless, there are machining operations on difficult features that can be re-used for portions of future jobs. We are invested in CAMWorks for longevity and work daily to build up the technology database for the long term. That database includes everything that we've ever done since implementing CAMWorks. It has grown, and will continue to grow, over the years, capturing our precision machining expertise and re-using it for years to come."

Training the Next Generation of TECMA Machinists

TECMA's transition from manual machining to 3D digital machining with CAMWorks has created opportunities for the company to work with local schools to initiate apprenticeship programs and train the next generation of TECMA machinists. "When we upgraded our machines and programming capabilities, we encountered difficulties finding machinists. At the same time, we were donating our old manual machines to local high schools to help them build their mechanical engineering and Robotics programs," Susac explains. "This helped us build relationships with the teachers and students to offer summer internships and eventually custom apprenticeships. We hired one of the summer interns who is now going through our apprentice program, learning CAMWorks, and is already programming 5-Axis work. Not every 20-year-old can say he is making space propulsion engine parts on a 5-Axis! CAMWorks is an important spoke in the wheel that's rejuvenating the company, and we have quadrupled our number of machinists as a result.



TECMA works with local schools and offers summer internships for the next generation of machinists.

Ultimately, TECMA's switch to CAMWorks has done more than just increase productivity. By allowing the company to remain competitive, its impact is bigger than business: "This whole experience has made me really proud of my father and the strong foundation that he built. His passion for high quality workmanship and pristine finishes is embedded in TECMA, so when I use modern tools like CAMWorks, it's been easy for me and the company to remain successful. I think the advancements we have made uphold my father's legacy and I think he would be really proud of the growth we have made."

Contact us:

Phone

US (480) 367-0132

International:

Europe: +49.172.7874221

Asia: +91 (22) 67056880

Email: camworks.inquiries@hcl.com

About CAMWorks

 CAMWorks, developed by HCL Technologies, is the next generation best-in-class CNC programming solution that enables users to program smarter and machine faster. Originally introduced in 1997, this state-of-the-art solids CAM product is designed for product-oriented manufacturing companies, and is available for machining centers, turning, mill/turn, and wire EDM applications.