

Digital process chain

Connectivity opens up growth opportunities

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Together with Siemens, W.A. Pfeiffer has implemented a digital process chain that provides more transparency across all processes.

Picture: Siemens

How can a small company compete globally? Andreas Pfeiffer, owner of W. Andreas Pfeiffer – Maschinen- und Apparatebau, has a clear answer: "through technology". That's why the company relies on an end-to-end CAD-CAM-CNC process chain with solutions from Siemens.

Anyone who visits the 25-employee machine shop in the small town of Zirndorf west of Fürth and Nuremberg would never suspect that they are looking at a real "hidden champion" of digitalization. Nestled

between single-family homes and small commercial enterprises, the family-owned business creates precision components for a wide variety of applications such as optical devices, machinery, and medical technology.

In contrast to its quiet surroundings, W. Andreas Pfeiffer's production hall is abuzz: In two shifts, employees work on sixteen CNC milling and turning machines to fulfill customer orders.

GALLERY



Business is going well, even as the market has become more demanding, says owner Andreas Pfeiffer. "Parts continually become more and more complex while higher demands on production quality are being made. At the same time, our customers expect us to be able to produce small batch sizes quickly and cost-effectively. Our challenge is that we can no longer physically expand at this facility."

Integrated software for higher productivity

To grow, W. A. Pfeiffer invests in new technologies. "The goal is to achieve higher production automation and end-to-end connectivity so that we can reduce set-up times and minimize throughput times".

With the Siemens software solutions, which includes Teamcenter, NX, Mcenter (formerly Sinumerik Integrate), and Opcenter APS, this end-to-end, digital process chain has now become reality at W. Andreas Pfeiffer. From order acceptance to invoicing, data is managed centrally, and duplicate entries are eliminated.

When Andreas Pfeiffer describes the solution's advantages and history, you can feel how important it was to the entrepreneur to implement these systems. He also works on his own machines, so he knows what he is talking about. "You have much more information in the set-up phase. There are fewer ambiguities, I can immediately see which tools I need, which tools are available in which quality, which materials I need," Andreas Pfeiffer says. "This allows us to machine the components with minimized set-up work."

"In recent years, we have increased our efforts to standardize our processes and data for the tools, programming templates and clamping devices. To see all these ideas come together now and to work with this digital process chain for the first time is simply terrific."

Andreas Pfeiffer

More automation and smart manufacturing solutions

This completely digital part manufacturing process is the result of a long series of innovations that the company has been working on extensively in recent years. "Many manufacturing companies like ours have closed their doors for good in recent decades. We wanted to be able to compete. That's why we took the first steps towards a higher degree of automation and smart manufacturing solutions over 20 years ago, starting with the Sinumerik CNC technology," says Andreas Pfeiffer. "Later, we introduced computer-aided manufacturing using Teamcenter and NX CAM software. In recent years, we have increased our efforts to standardize our processes and data for the tools, programming templates and clamping devices. To see all these ideas come together now and to work with this digital process chain for the first time is simply terrific."

How the digital manufacturing process works

- At W. A. Pfeiffer, the integrated manufacturing process begins with incoming customer orders. The order is created in the ERP system and in the Teamcenter software at the same time. Teamcenter also imports the design data for the product to be manufactured.
- The needed materials are then ordered and the due dates simultaneously planned using the Opcenter APS software. “All tools work together seamlessly, which makes it much easier to coordinate,” says Andreas Pfeiffer.
- The job data is then seamlessly transferred from Teamcenter to NX. The 3D models are prepared in NX CAD for programming and the necessary fixture components are either selected from the library or designed.
- The machining operations are then programmed in NX CAM, using the CAD data. W. A. Pfeiffer uses G-code-driven simulation in NX to verify the generated operations.
- This NC data then goes into production planning, where the complete NC code is validated using a digital twin of the machine. This ensures optimized and error-free operations.
- Workers can access all functions directly in production via mobile terminals. This direct connection between planning and production continues through to the CNC control. The machine programs generated by NX CAM are transferred to Manage MyResources via Teamcenter along with lists of tools.
- The physical tools are managed, balanced and, if needed, assembled and measured using Manage MyResources. The data package is then transferred to the machine controller. After a test run by the operator, the job order goes into production.

Reduce setup times by up to 50%

For Andreas Pfeiffer, the investment in the new software has already paid off. “Just by analyzing our processes during the implementation, we were able to improve many processes.” These new tools have been well received by his co-workers as well: “We no longer have duplicate data storage; we have much better transparency across all processes. In the past, employees in production often had to ask: Where are the components? Which CNC machine should I use? What kind of cutting methods should I use to efficiently manufacture this component with minimum tool wear? We can now answer all this with the information that the software solution provides us. I expect that we will be able to reduce setup times by up to 50% overall.”

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