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Producing instead of programming

The Eirenschmalz company has put the new Programming Tube 3D software through its paces. Working on the tube cutting machine is now even more fun.

When it comes to processing tubes, Stefan Janetzki, team leader at Eirenschmalz Maschinenbaumechanik & Metallbau, is not easily outdone. Laser tube cutting has been an important part of the company business since 2000. Today, two TruLaser Tube 7000 laser tube cutting machines from TRUMPF process round, square and rectangular tubes and profiles ranging from a 10 to 254-millimeter outer circle diameter and wall thicknesses up to 10 millimeters in a 3-shift operation. Stefan Janetzki has a lot of experience with programming, even difficult machining operations. "But," he explains with a grin, "with single threads, it was often faster for me to insert them by hand." So, in July of 2019, when TRUMPF asked if Eirenschmalz wanted to be a test customer in the development of the new Programming Tube 3D software, Janetzki and the Head of Product and Technology Development at the family business, Markus Eirenschmalz, didn't hesitate to say, "Yes".

Getting to the tube

With its two locations in Bavaria, Schwabsoien and Augsburg, Eirenschmalz Maschinenbaumechanik & Metallbau GmbH, founded in 1990, offers the complete sheet metal process chain. In Schwabsoien, around 35 tons of material are processed per day. The focus is on 3D laser cutting, welding and tube processing. Markus Eirenschmalz explains: "When we bought our first laser tube cutting system in 2000, the technology was still new to many of our customers. We therefore supported them in part design even back then and showed them the great possibilities that laser tube cutting offers. That excited them, and it still does." Today, Eirenschmalz benefits from years of experience in laser tube cutting and supplies numerous industries such as mechanical engineering, the food and pharmaceutical industries, and furniture manufacturers with individual parts and complete welded assemblies. "Quality and speed," explains Markus Eirenschmalz, "are the focus for our customers. In the case of 3D laser cutting, all the possibilities are largely exhausted. In the supreme discipline of laser tube cutting, the technological development of the system is also top-notch. So, we were very interested to see what potential there would still be in the software when it came to programming."

With currently 200 employees in Schwabsoien and 150 more at its subsidiary blechTech in Augsburg, the Eirenschmalz group of companies is a full-range supplier in the sheet metal production field. In addition to simple laser parts, the company manufactures sophisticated precision laser parts as well as assemblies and complex system components. (Picture: Stefan Hobmaier)

For Markus Eirenschmalz, Head of Product and Technology Development at the family-owned company, the focus is on quality and speed in production: "The time savings in programming add up so much that they have a positive effect on the complete throughput time, especially with welded assemblies having many individual parts." (Picture: Stefan Hobmaier)

The new Programming Tube software automatically creates the NC program from the thread parameters, including all the required tools and the machining sequence. In this way, up to 80 percent of the time previously required for spindle machining can be saved. A value that the programmers at Eirenschmalz are also approaching step by step. Janetzki: "We're already saving around 20 percent of programming time - we're sure that we'll soon reach 50 percent time savings." (Picture: Stefan Hobmaier)

Features such as direct editing, the ability to simulate, and automatic programming of NC programs based on the 3D CAD design in Tube Design ensure that 99 percent of all parts run out of the machine as they should without operator intervention. (Picture: Stefan Hobmaier)

The programming time saved by Programming Tube has a positive effect on the complete cycle time, especially for complicated welded assemblies. (Picture: Stefan Hobmaier)

Snappily programmed

The TRUMPF software developers examined how well improvements could be made based on the user behavior of their test customers: In which cases did they use the programming software and - even more interesting - in which cases rather not? Martin Weihrauch, Product Designer at TRUMPF explains, "We told ourselves that there must be good reasons if the software is not used in some cases, and it turned out that these were usually cases where the programming was so cumbersome that customers preferred to find other ways." At Eirenschmalz, for example, it became apparent that the insertion of individual threads was very often done by hand. Stefan Janetzki confirms: "We only programmed threads when we needed them for a larger series or were sure that we would need a particular thread again. Programming was then worthwhile for that."

When programming a thread, the programmer had to specify a hole for each thread with the click of a mouse and then select the appropriate tool combination. Then it was a matter of determining the correct machining sequence to avoid collisions. The new Programming Tube software automatically creates the NC program from the thread parameters, including all required tools and the machining sequence. Says Janetzki, "Across all our parts, we're already saving about 20 percent in programming time, and we're sure we'll get to 50 percent time savings soon."

The time savings in programming add up so much that they have a positive effect on the complete throughput time, especially with welded assemblies having many individual parts.

Markus Eirenschmalz, Head of Product and Technology Development at the family business

A 99 percent fit

The interaction between Tube Design, Programming Tube and machining on the machine now also works perfectly. Janetzki explains, "Of course, our designers have always consulted with the colleagues who subsequently have to manufacture a component on the machine. But now the software tools also mesh even better." Based on the 3D CAD design in Tube Design, Programming Tube creates NC programs automatically.

Manufacturing on the machine then works 99 percent of the time without the operator having to take corrective action. However, if changes in the design become necessary, Programming Tube automatically does them. For some profiles, such as L profiles or sharp-edged aluminum parts, redesigning is no longer necessary.

Programming Tube also sets new standards in terms of ease of use: When programming, the programmer can move an object to the desired position by editing it directly, and then use an automatic simulation to ensure that the machining is error-free. The program corrects incorrect data as well as rounding radii. With just a few clicks, positioning aids and bend connections can also be inserted. Janetzki: "The automatic determination of machining sequences, the improvement of loading and unloading strategies, and the simplified programming of special profiles are milestones of this new software. We can use it to program almost all of our components quickly and reliably so that they run off the machine without errors."

A giant step forward

Markus Eirenschmalz and Stefan Janetzki are thrilled after months in test operation: "Programming is much easier now. No one has to imagine the complete machining process anymore, which makes the software more comprehensive and reliable." A point that also gives the operators at the machine greater confidence.

Markus Eirenschmalz sums up: "You have to relate the enormous time savings in programming to the entire process chain. Especially for welded assemblies with many individual parts, the accumulated time savings are so great that they have a positive effect on the complete throughput time. That's a big advantage for us and it makes our customers happy."

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