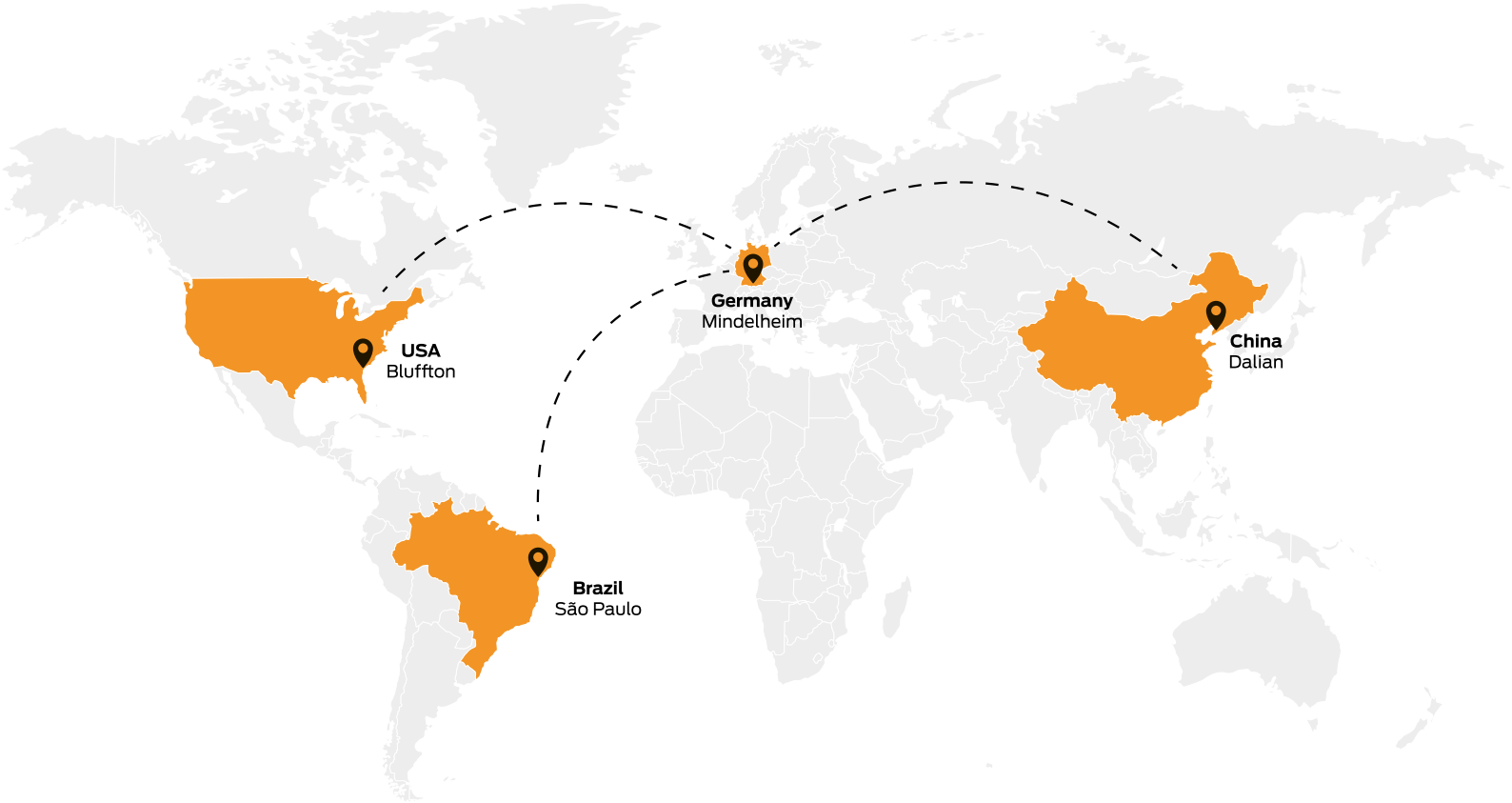

NC programming: From Bavaria to the rest of the world

GROB uses TDM‘s tool management solution for international knowledge transfer

DeIn just a few years, the machine tool manufacturer GROB has achieved something that most com-pany bosses can only dream of: Market leadership in a new business area. According to the com-pany, one of the reasons that the family-owned company was able to launch sophisticated ma-chines for the production of vehicles with alternative drive technologies on the market so quickly is thanks to the tool management software from TDM Systems.

When efficient and highly precise machining of workpieces is required, this is where the machines from the globally operating, family-run company GROB come into play. However, with the strategic alignment of the OEMs to vehicles with alternative drives, there was a threat to the market leader‘s turnover in this area. The fact that this did not happen is due not only to the management‘s foresight, high investments in training and machines, but also to a high-performance tool management solution. For over 22 years now, the TDM application has ensured that the right tools are at the machines at the right time at Grob-Werke GmbH & Co. KG in Mindelheim (Bavaria), a holding company of the Grob Group. Furthermore, thanks to an interface to the Siemens NX CAM solution that is used, the software also increases the efficiency of the NC programmers and, ultimately, a company-wide enforcement of standards at GROB.

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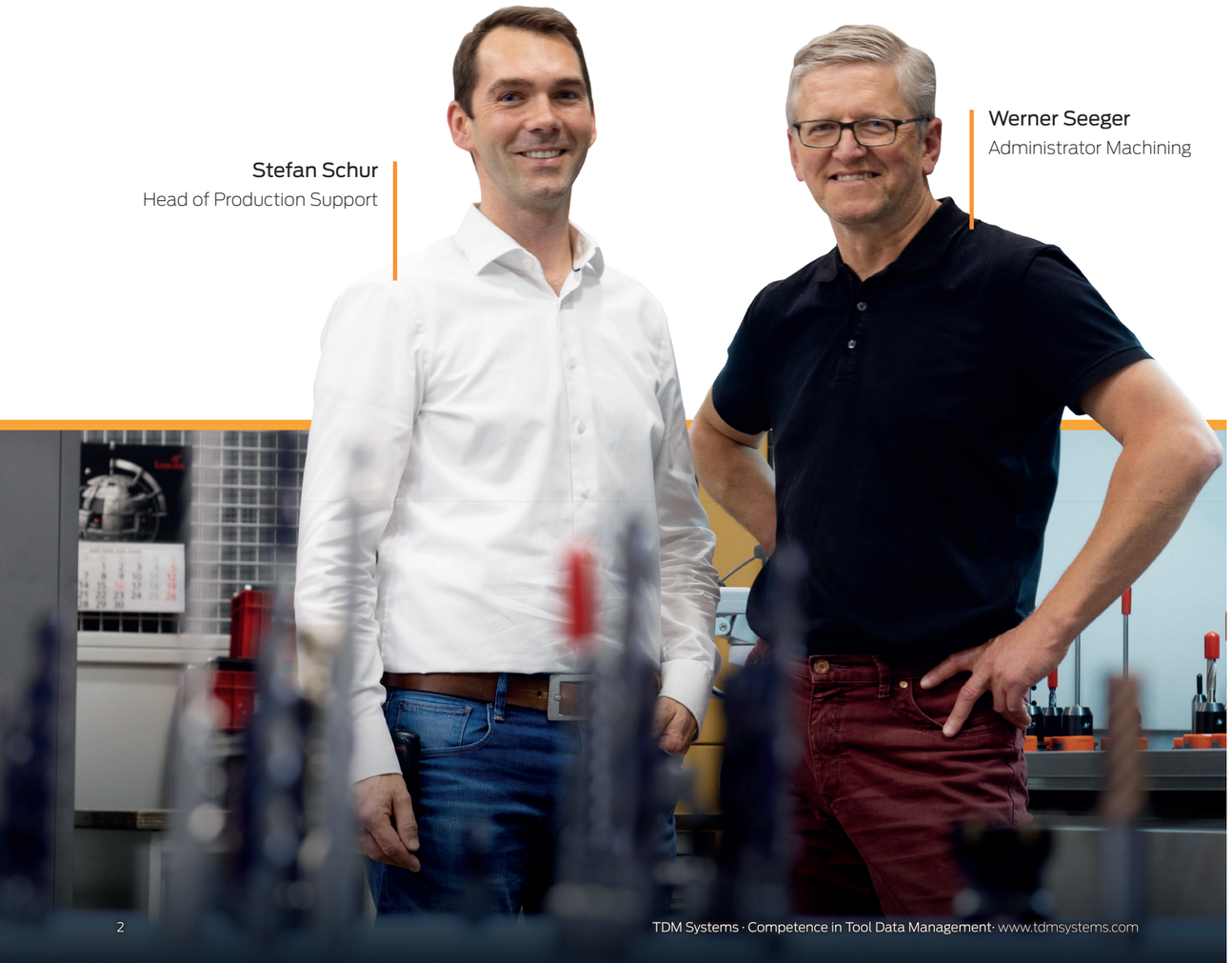
TDM in use

TDM: A far-reaching decision

„Everything started very small," remembers Werner Seeger, Administrator of NC Programming at GROB, who has now been with the company for 40 years. After a test run more than two decades ago showed that the tool management solution from TDM could be used to optimize the tool management as required, the management team decided to comprehensively introduce the software in the year 2000. In the course of the TDM implementation, a standalone solution which, as Stefan Schur, Head of Production Support at GROB, describes, „had no connection to the workshop" was discarded. The consequence of this sort of isolation: The tools that the NC programmers selected for the machining were often not at the machine. Or, even worse, they could often not be assembled as planned by the NC programmer.

„This was inefficient, led to errors, and irritated the machine operators," summarizes production engineer Schur. However, since GROB has been working with TDM, there have been no further data silos. On the contrary. Today, the software continuously shows the entire tool circulation, from storage right through to purchasing. And, since there is only one central TDM database, all participants, even internationally, access the same data records. „The globally operating, family-run company therefore recognized earlier than other companies that the provision of consistent tool data makes the entire shopfloor more efficient," stresses Christoph Oechsner, Project Manager at TDM Systems and jointly responsible for the introduction of TDM at GROB.



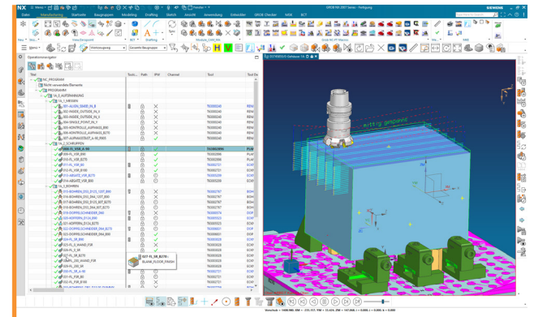
Stefan Schur
Head of Production Support

Werner Seeger
Administrator Machining

TDM in use

An interface for enforcing standards

However, the tool management was not the only thing that was professionalized by GROB with the introduction of TDM. The NC programming was also very quickly raised to a new level. When the Siemens NX CAD/CAM/CAE software was introduced in 2007, GROB also immediately invested in the corresponding TDM interface. According to Schur, using the FBM (feature-based machining) interface features contributed to „a boost in performance". A feature that accelerates and standardizes the programming. 40 NC programmers at the German site and, in total, approx. 30 NC programmers in the USA, China and Brazil work with NX and FBM today. And it is not always necessary to „reinvent the wheel", says Schur. Because, when faced with approx. 30,000 used tool assemblies and approx. 7–8 material groups with dozens of individual materials and, therefore, 100,000 selection variants, the NC programmers would „quickly be overwhelmed", according to Seeger.



Performance boost due to the TDM-supported interface feature FBM: with the automated suggestion of suitable tools for each workpiece feature, manufacturing standards are implemented globally.

Instead of manually selecting the corresponding tools for each workpiece feature in the database for inserting holes or threads, as was the case previously, these are now automatically suggested to the programmer. In addition to avoiding additional costs, this also „guarantees that the machining always meets our high requirements, regardless of the respective programmer," says Schur. At GROB in Mindelheim, an administrator determines in Siemens NX which tool should be used to regularly machine certain features. The individual NC programmer therefore only needs to search for the features of the relevant workpiece in Siemens NX. The program then adds up the tools that meet the predetermined guidelines for all identified features. Exactly those that are already used as standard tools on the respective processing machine. Only if the existing tools are not sufficient for the machining does Siemens NX request the right tool for the feature in TDM and upload this accordingly.

Grob machines are assembled in Mindelheim and shipped all over the world.

TDM in use

Worth the effort

However, this only works smoothly „because we maintain our data accordingly and the data records for the tools that are loaded in Siemens NX are compared and/or synchronized with TDM each day," says Schur. From the very beginning, data quality has involved GROB maintaining feeds & speeds for all tool assemblies in TDM. This means that information is stored for each tool, detailing which steel grades or which composites it can machine. By storing this data, TDM can then filter for the right tool for the machining in accordance with the specifications from the administrator and/or NC programmer from the variety of existing tools. GROB has not identified concrete figures on how the use of the FBM features affects the performance of the NC programmers or the utilization of the machines. However, „we can clearly feel that we are more effective," says Schur. Here, it is not only the production of workpieces that has increased in the last three years, according to Schur. In his opinion, it was also possible to further increase the machining precision. But not only that. The level of trust in the processes has now become „extremely high". For bore holes, for example, there are no longer any queries – „they are a runaway success". This also means that the machines can now be run in more quickly in the event of a workpiece change. The machine operators simply know that the tools specified by the NC programming do exactly „what they should". For Schur, there is therefore no doubt that the successful capture of new business areas „has a lot to do with the fact that we can use TDM to provide up-to-date tool data, into which our entire production expertise has flowed, to all production participants."

Stefan Schur, Head of Production Support at GROB

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Quick access despite huge data volumes

Using the FBM features of the TDM Siemens NX interface is therefore advantageous too – at the overseas sites, due to the vast volumes of data that have to be transferred from the server in Mindelheim to the USA or China for the NC programming, up until 2019, the NC programmers had to schedule waiting time. For GROB's decision-makers, this became „a real problem", according to Schur. However, together with Siemens, TDM succeeded in using a modified request structure and data view to minimize the data volume that is to be transferred and to therefore „efficiently establish" the NC programming overseas as well. A huge success – even in the eyes of Schur and Seeger. They are convinced that the family-owned company, which employed 7500 members of staff and had a global turnover of €1.2 billion in the 2021/22 financial year, would no longer have been able to work or produce cost-effectively and efficiently without TDM and the Siemens NX interface. What is more: „The machines would come to a standstill very quickly in the event of a failure."

Everything at a glance

Tool management connects processes and ensures tool availability

TDM in use at GROB

Mechanical engineerin

Production and automation systems for various industries, such as automotive and aviation, as well as electric mobility

Unternehmen

- Founded in 1926 in Munich
- now an international manufacturing international machine tool manufacture
- headquarters in Mindelheim
- 7.500 employees
- 1.2 Mrd. billion turnover

Focus in this use case:

- TDM-CAM interface to Siemens NX incl. TDM-supported use of Feature-based Machining (FBM) in NX
- 40 NC programmers in Mindelheim and approx. 30 NC programmers in the plants in the USA, China and Brazil use the interface, incl. FBM

Objectives for introducing and using the TDM-CAM interface to NX

- **Management of hundreds of thousands of selection variants for tools** via 30,000 tool assemblies with 7–8 material groups and dozens of individual materials
- **International enforcement of manufacturing standards** by centrally allocating tools, technology and machining features
- **Greater performance overall in NC programming**

Process innovations

- **Centrally maintained data pool** with complete tool data, feeds & speeds and materials
- **Automated tool selection:** Allocation of tool assemblies and material groups to the machining features allow for automated creation of tool suggestions with FBM
- **Performance boost in CAM programming:** Thanks to automated tool selection and fast data access to large volumes of data (especially internationally)
- **Central definition of shopfloor standards** for each individual machining operation; these are passed on **to each plant** via TDM

Advantages

- International enforcement of manufacturing standards and quality assurance
- Absolute transparency over 30,000 tool assemblies and their potential applications
- Highly integrated CAM process – also globally
- Extremely high confidence in the planned processes

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TDM Systems · A Member of the Sandvik Group
www.tdmsystems.com

TDM Systems GmbH
Derendinger Straße 53 · 72072 Tübingen · Germany
Phone +49.7071.9492-0 · Fax +49.7071.9492-707

TDM Systems, Inc.
1901 N. Roselle Rd. Suite 800 · Schaumburg · IL 60195 · USA
Phone +1 847.605-1269 · Fax 847.605-0586