Kempf GmbH achieved nearly 100 percent utilization of his machines

Everything Revolves around Tools

The three most important factors of a property are: Location, location, location. And in manufacturing? Stefan Kempf, Head of contract manufacture, Norbert Kempf GmbH, knows the answer: „The tool, the tool, the tool." TDM enables the necessary control over the tools.

oolant seems to run in his veins: Stefan Kempf puts his heart and soul into being the head of contract manufacture at Norbert Kempf GmbH in St. Ingbert, a town in Saarland, Germany. The company employs approximately 100 employees and manufactures parts and assemblies for customers in the fields of pneumatics, hydraulics, automotive, construction machinery, and prototyping in 2500 square meters of space. Kempf also manufactures machine pallets. Every day, about 2500 parts leave the operation. At first glance, it is nothing special. However, a second look is worth it. It is finally clear when Kempf shows the utilization of his machinery through a projector in real-time: Things work differently here. Almost all of the machines are in production around the clock; the utilization rate is nearly 100 percent. Nevertheless, there is no hustle and bustle in the halls; all of the work is concentrated, but relaxed, in short: The shop runs. Many large mass production manufacturers would be happy to push forward into these regions, even just a little bit.

Reliable Processes are essential

Stefan Kempf has been working for Kempf GmbH since 1991, which was founded in 1970 by his father, Norbert, in his own home „between the washing machine and the clothesline." He has been the sole managing partner for the last five years and makes no secret of his recipe for success: „Our utilization rates are based on absolutely reliable and reproducible process that can only be achieved through rational tool management beforehand - TDM helps us with this."

For years, he and his employees analyzed the restricted crib again and again in search of the causes of errors. Result: „60 to 70 percent of all errors are caused by mismanagement of tools, assembly errors, poor radial or axial run out, wrong individual items, or because the tool was not getting to the machine on time."

Other factors played only a subordinate role. „I can sometimes bring machine pallets and workpieces quickly down the hall to the machine with the forklift, but without tools,

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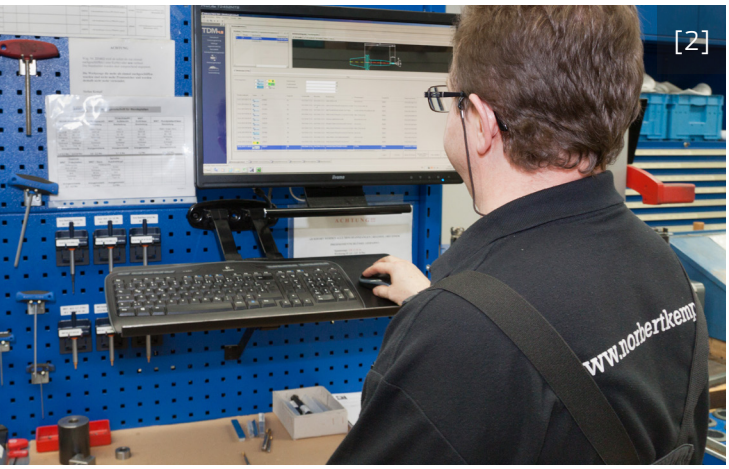

[1] Stefan Kempf, managing director of Norbert Kempf GmbH.

[2] [3] Thanks to pre-defined and parameters provided by TDM, employees in the tool assembly can check the tools for plausibility at the same time and thus rule out errors in the assembly.

[4] The tool machines are interlinked on their rear sides by a pallet and raw material crib and on the top by a gantry robot.

my shopfloor comes to a standstill.“ Since coming to this realization, the three main prerequisites for smooth production are in his mind: The tool, the tool, the tool.

For every order that comes in, a process planning order is triggered, from the production control plan via the Failure Mode Effects Analysis (FMEA) to the design and CNC programing. „Our constant main topic,“ says Kempf, „is the set-up costs-neutral production, which we handle using TDM.“ The machines are standing still only for the initial setup of a new part. All other setup processes take place outside of the machines, while the machines do what they were built to do: Machine around the clock.

Production with a System

In 2003, Kempf invested in a flexible manufacturing system from the automation specialists, Fastems - a machining center with twelve machine pallets. In 2011, the maximum expansion level had been reached but still without upstream tool management. „Then we started the largest project in the company‘s history, the ‚Project Kempf 2013‘“ - a new production hall, the production system from Fastems MSL / CTS, and the introduction of tool data management, TDM, which supplies both flexible manufacturing systems with tools.

The core of the system is a high-rack storage, which houses the machine pallets with the clamping devices and the raw materials. A racking storage and retrieval vehicle transports the pallets to the seven machining centers or to four loading stations for mounting. The central tool storage unit that is arranged at a right angle to this has space for 2500 tools and a crib robot. The steel colleague sorts and puts away new tools and brings worn tools to the withdrawal station. If tools are needed on the machines, it passes them to a gantry robot that travels on rails over to the machine and loads it into its magazine. This still only serves as a buffer.

This complex tool circulation is organized by TDM, which is familiar with all of the important tool data, including their remaining tool life, and knows exactly when and where each tool is used. „We automatically provide each tool with an RFID chip that contains all of the relevant data,“ explains Kempf. Once the tool arrives at the machining center, geometry data and tool life is read. „But above all, the remaining tool life is communicated with used tools.“ And the system thinks for itself. If a tool receives a tool life warning, the robot delivers a replacement tool into the magazine chain on time.

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The Difference between New and Used Tools

New and refurnished tools have different tool lifes - an important realization that the system takes into account. At this point, there is no TDM software alternative that can detect different tool states and assign that particular tool. „We know down to the second, what the tool life of each tool is and how much tool life we need to produce a part. 36 hours in advance, the system executes a resource check to see how much tool life of a tool type is still in the system. If that amount is under the required tool life, our tool assembly automatically receives an order request and gets informed exactly when the tool will be used.“

The TDM software also helps to make sure tools are ready for use. The presetters devices serve not only for the tool assembly. They also receive numerous, predetermined characteristics about the tools, which enable a plausibility check, from TDM via an interface. This balance between the actual data and the nominal data stored in TDM ensures that only perfectly mounted tools enter the system. Kempf: „A key issue for reliable production.“

Conclusion: TDM manages and controls the tool crib at Kempf. The focus is on supply security of the machine with tools. TDM reports bottlenecks and problems well in advance so that countermeasures can be taken in a timely manner. The order-oriented tooling and preparation outside of the machines avoids follow up setup times. Thus, Stefan Kempf achieved nearly 100 percent utilization of his machines despite an average of one new part a day.

[6] Everything under control: Stefan Kempf can permanently track the usage of his machines in real time.

[7] A gantry robot moves on rails over seven interlinked tool machines. It brings the necessary tools from the central crib and passes them to the machine's magazine. It takes back tools that are used up or no longer needed.

The company, Norbert Kempf, is a medium-sized contract manufacturer with 100 employees. With its modern machine park of more than 20 machining centers, the medium-sized company supplies renowned customers in the pneumatics, hydraulics, automotive, construction machinery, and prototyping. The range of workpieces consists mainly of sophisticated, four-axis machined items and assemblies.
www.norbertkempf.de

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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