



# Trends in the machine tool – Part 1

## Classic qualities remain in demand

*Machine tools are rightly considered to be technology carriers and trailblazers for other industries in mechanical engineering. They frequently are the first to try new technologies and optimize existing ones. For this reason, machinery users expect every new piece of equipment to increase productivity.*

The users of machine tools face global competition. When they invest in new machines, they generally have two main issues in mind: cycle times per processing step and throughput times for the completely processed component. At the same time, they continue to increase their requirements for surface quality and tolerances. Machine tool makers respond with higher dynamics in all movements and the integration of additional processing technologies. Increasing

numbers of sensors are now monitoring the processing job to create reproducible quality.

These

three trends – more speed, more completeness and more precision – place increasing demands on the control system. Every gain in speed requires shorter control cycles. The CNC control unit must provide additional capacities to integrate additional processing stations and technologies. At the same time, data transmissions in a machine are rising inordinately because of the sensors.

In this regard, Bosch Rexroth has significantly raised the bar with its new generation of the [CNC system MTX](#). The smallest version is a compact solution for up to 12 axes. The highest performance level extends all the way to 250 axes with a hardware control system. In the controllers, high-performance, multi-core processors intelligently assign the different tasks for CNC, PLC and communications. Fluctuating processor utilization levels that vary based on the configuration for the application remain non-reactive and ensure constant overall performance. This is important because the CNC system solution provides the shortest PLC and CNC cycle times even as the number of axes rises, even for high-speed processing. In the process, machine manufacturers can significantly increase the dynamics of their products.



More computing power for increased processing quality and the parallel exchange of information with superior IT applications: Rexroth's CNC system MTX. (Source: Bosch Rexroth AG)

At the same time, more and more users, particularly automotive industry suppliers, are investing in production lines for complete processing. To reduce wrapping and handling times, they are looking for multi-technology solutions. For this reason, machine manufacturers are increasingly combining classic processes like drilling, milling and grinding into one system. They are also increasingly adding non-cutting technologies like laser cutting and welding or additive processes. The printed components are given their final shape in subsequent processing. These technologies are sometimes very computationally intensive. They are also done simultaneously with other processing steps. The idea of offsetting these performance peaks by using separate control systems with a machine's own hardware significantly increases the complexity of automation. The [MTX](#) offers sufficient power

reserves here to display all currently known uses on hardware. This is also the case for the automation of machine tools. A number of manufacturers have said that between 50 percent and 80 of all machines they deliver have integrated loading and unloading systems. The [MTX](#) also takes on this task.



Increased productivity through complete processing: Manufacturers are increasingly combining cutting and non-cutting technologies like laser cutting and welding as well as additive processes in a single machine. (Source: Bosch Rexroth AG)

While these trends move forward, machine manufacturers are also increasingly adding more and more sensors. These data support process optimization and monitor the processing in situ. With fast [I/O](#), the [MTX](#) ensures that the sensor data are transferred and analyzed in real time. In the process, it lays the foundation for short control cycles that measurably increase the precision of processing and surface quality.

In short: To achieve the classic qualities of increased productivity, all roads lead to higher-performance CNC system solutions. The [MTX](#) currently offers the highest computing capacity and system capability for rising demands by offering increased dynamics, technology combinations and amount of sensors.

*Read*

*the next section of this story and learn about the standards that end users are focusing on as they network their machines and the way that the [CNC system solution MTX](#) is prepared for them.*