

■ Scherer Feinbau GmbH, Germany

Wheel Hubs in Seconds

A new production line for chassis components with three VDZ 120 DS vertical turn centers from Scherer Feinbau – all with state-of-the-art CNC technology – meets the highest demands for productivity and quality.

Each day in Ingolstadt, Germany, Audi produces auto components for various models – from pivot bearings and wheel bearings to wheel hubs and brake discs. In order to do this cost-effectively, Audi regularly develops innovative technologies together with its machine suppliers. “In time, our joint pioneering work establishes itself as a general market standard,” explains Franz Robl, who is responsible for e-technology planning and series support in chassis component production at Audi. One of these proven partnerships is with Scherer Feinbau Maschinen GmbH, in Mömbris. Three VDZ 120 DS double-spindle vertical lathe centers from Scherer with a Sinumerik 840D sl CNC are integrated into a new production line installed in 2008. They operate according to the pickup principle and have a modular design. They can manufacture workpieces with a turning diameter of 10 to 220 millimeters. The rapid traverse speeds of the x-axis range up to 60 meters per minute, and in the z-axis up to 30 meters per minute. The basic elements of the machines are cast in a box version with special concrete and therefore ensure the best damping, rigidity, and performance values. Circulating roller units ensure low friction and high precision.

From the forged part to the finished wheel hub

At the moment, the VDZ 120 DSs in the Audi component production facility in Ingolstadt are used only for soft and hard machining of wheel hubs. An integrated robot picks up the unmachined forged steel part from the workpiece carrier and places it in the transfer station of the first spindle. This spindle moves out of the working area, picks the piece up, and moves back to the machining position. First, the brake disc contact surface of the workpiece is turned off. After that, a robot picks up the hub in the transfer station, turns it over, and passes it on to the second spindle. Then the bearing seat on the wheel bearing side is premachined with a defined measurement. After the hardening and application of the internal toothing, the wheel hubs are transferred to another VDZ 120 DS by the automatic workpiece

carrier. The robot places them alternately in the transfer stations of the two spindles. Then the machines finish turning the hardened bearing seats and check the dimensional accuracy and surface quality with an integrated measuring station. This all happens within a cycle time of 45 seconds per spindle.

“It’s an efficient solution,” says Robl. “We wrote a specification and compared various machines before buying it. The VDZ 120 DS ultimately won.” The double-spindle machine version contributes to the high line productivity, among other benefits. It also enables efficient parallel and two-side processing of the workpieces in one machine.

Synchronous motor spindle for high precision

Scherer Feinbau uses synchronous motor spindles with water cooling to achieve the highest possible precision and cutting performance. Company owner Frank Scherer explains: “We need high performance with low space requirements. We have had a very good experience with the motor spindles from Weiss Spindeltechnologie GmbH in particular.” Another advantage of the solution is the Sinumerik 840D sl CNC without an open operating system. This is important above all for security and support reasons, because an open structure is vulnerable to viruses. Regular operating system patches used to be necessary and virus scanners had to be used. The Sinumerik Solution Line operates based on Linux, which creates even more stability in the system. Thanks to an extremely efficient processor, the version also gets by without a PC and hard disk, which, as a mechanically moving part, has only a limited lifespan and can be a frequent cause of failure. This circumstance also increases operational reliability. The data security is handled easily by a Flash memory card in the NC unit.

Since the introduction of the Sinumerik 840D, only digital drives have been used, and the drives can be set up in a decentralized arrangement with the 840D sl.



Before and after: wheel hubs machined on Scherer Feinbau VDZ 120 DS vertical centers with Sinumerik 840 sl CNC



Audi wheel hubs on the way to final hard machining



»The CNC still works perfectly.

We have a high reliability and the support never lets us down.«

Franz Robl, responsible for e-technology planning and series support in chassis component production at Audi

This has already been done in the VDZ 120 DS. The connection works via the Drive-Cliq interface, which recognizes all drives automatically.

Collaboration over decades

The Ingolstadt Audi component production facility has been collaborating with Siemens for 30 years. The first Sinumerik – a System 7 – was used in various index machines in 1979. Two of these are still sometimes used today for reworking customer service parts. “The CNC still works perfectly,” Robl stresses. “We have a high reliability and the support never lets us down.”

With the Siemens solution, Scherer Feinbau achieves high performance and flexibility as well as consistent openness – from operation to the NC core.

Sinumerik 840D sl offers safe control technology with the Safety Integrated concept via Profisafe. This offers advantages in the installation of the machine and in the event of any error diagnostics. ■

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www.siemens.com/sinumerik
thomas.wenemoser@siemens.com