High-performance machining

Machine and plant manufacturer Fill is taking a major step toward standardization and modularization with its new generation of syncromill F complete machining centers. CNC Sinumerik 840D sl type 1B makes the machines future-proof.

Approximately 80 million cylinder heads are manufactured worldwide each year. Of them, 16 million are produced on machines by Fill Gesellschaft m.b.H. Maschinen und Anlagenbau in Austria, as are 150 million chassis components. Today, one in three cars worldwide includes parts that have been produced on Fill machines. Fill has also made a name for itself in the aviation, wind power, sports, and construction industries. This was made possible, among other things, by the new complete machining centers.

High level of standardization and modularization

Previously, Fill’s activities had been shaped by the metal machining technology of special machine construction. Even back then, partial solutions had been developed with a view to their reusability, but with the new generation of syncromill machining centers, Fill is implementing a high level of standardization and modularization in high-performance machine tools. According to Markus Gadringer, product manager at Fill, “The level of customization possible will continue to remain high. As a general contractor, we will still assume responsibility on behalf of our customers for the product design from rough casting to installed finished part.” However, the effort required to retool for the production of different parts will be significantly reduced – an advantage for Fill customers that should not be underestimated in view of production batches that are getting smaller and the increased frequency of new designs.

“Thanks to the modularity and scalability of Sinumerik 840D sl type 1B, we can design our high-performance machining centers perfectly as modular production machines.”

Markus Gadringer, Product Manager, Fill Gesellschaft m.b.H.
Sinumerik supports machining diversity

The first member of the new family of machining centers is the syncromill F – a high-performance, highly dynamic, and flexible machining center specifically for hard-to-cut materials. The excellent cost efficiency of the syncromill F is the result of not just its high cutting performance. Handling of the workpieces in two specific clamping fixtures that are alternately pivoted into the machine space using a rotary table is another feature. This enables loading and unloading of workpieces parallel to machining without opening the actual machine space. The tool carriers are linked via rotary tables to a quick-change system that minimizes retooling times when changing to a different tool. A 48-space tool magazine arranged above the machining unit ensures short chip-to-chip times. Even for the existing generation of syncromill machining centers, Fill had decided on Sinumerik CNC inside the machines due to the high demands made on machining diversity.

To make the new machine generation future-proof, it also employs this CNC, more precisely Sinumerik 840D sl type 1B, which is perfectly suited to complete machining. With its high performance due to multicore technology, scalability, openness, and network capability, the universal and flexible CNC sets standards in precision and flexibility.

Energy efficiency is important

The performance and precision of the drives from the Sinamics S120 line, which are used to activate the servo- and spindle motors, are equally important to the success of the syncromill F. Gadringer stresses, "It is not only the perfect interaction of control and drive technology that is important for the high dynamics with which large masses are moved in around 15 driven axes in the new machining center. Energy efficiency is another important criterion for our customers." As a result, the syncromill F has, among other things, energy-saving operating modes with disconnection of any devices that are not required and a low-voltage DC link that is active only when it is needed. Sinamics S120 drives also feed the braking energy back into the grid. Fill uses Sinumerik Ctrl-Energy, a range of solutions for the energy-efficient operation of machine tools. The machine is fitted with a Sentron PAC4200 power-monitoring device with which it is also possible to establish a connection to external devices and the building services management system via the Fill CC control system to increase overall energy efficiency even further.

Collaborative development of technologies

In-depth knowledge of the current status of development is required to make optimum use of the control system. Gadringer explains, "We therefore consider Siemens to be more than a supplier, rather a partner involved in the development of the syncromill family. This accelerates software development, and it is also very important for a company like Fill to integrate state-of-the-art technological developments into its machines to make them future-proof."