■ Carl Benzinger GmbH, Germany

Ideal for Delicate Parts

Complete machining of parts for jewelry, medical products and the automotive industry using precision machines and Sinumerik 840D sl – for top quality and maximum productivity.

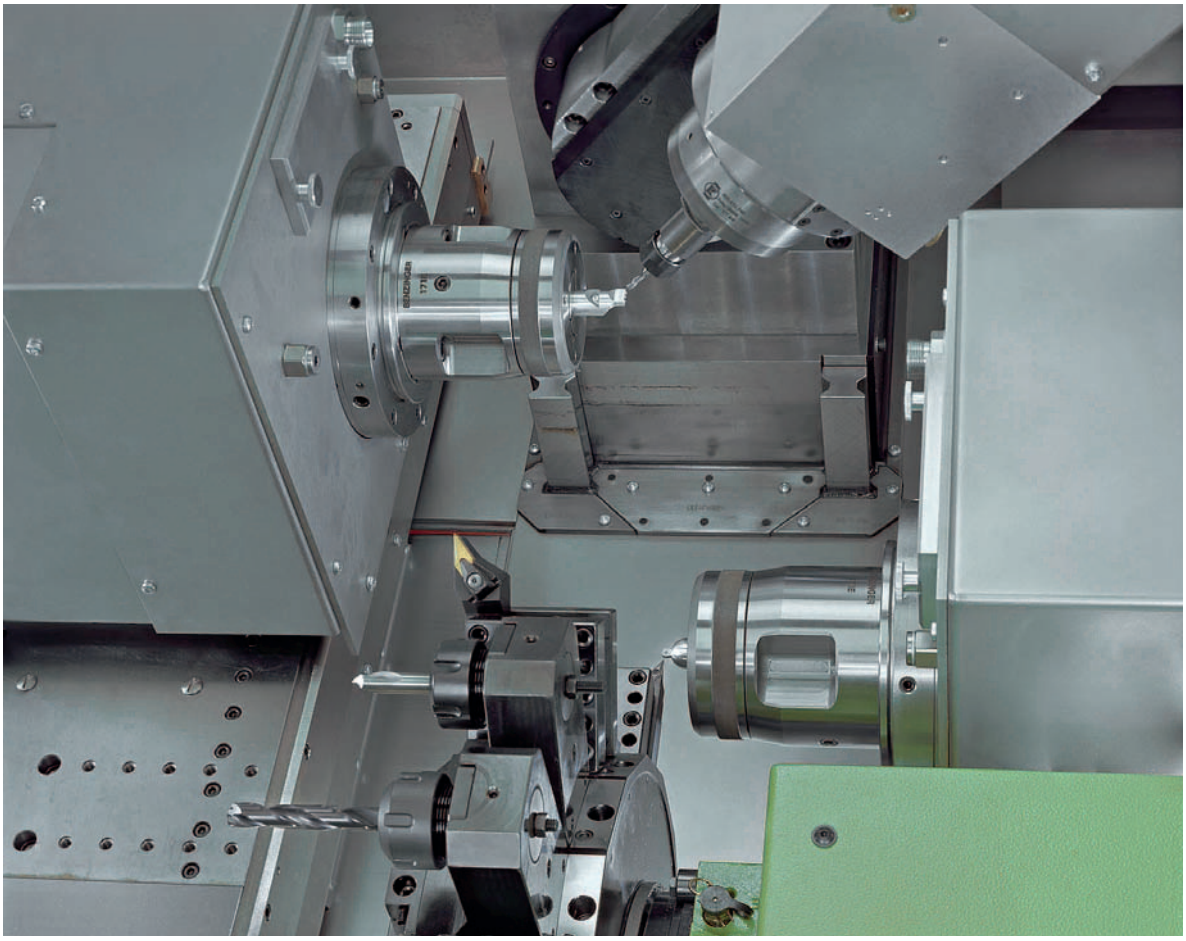
Manual work has largely disappeared from the jewelry sector – nowadays high-tech machines are used to produce freely formed surfaces with a mirror finish and fit pieces with tiny diamonds. The requirements placed on the machine manufacturers are correspondingly high. Carl Benzinger GmbH of Pforzheim, Germany, makes precision machines that are accurate to less than a micrometer in terms of surface quality, roundness and positioning. The machines are used by all major companies in the watch and jewelry industry, as well as in other demanding sectors such as medical and dental part production, automotive technology, and the fittings and the aerospace industries.

Customer proximity defines machine development

The company with a staff of 140 people bases its success on its proximity to the customer. Benzinger offers a complete concept that includes process automation with robot and application technology, along with services such as After-Sales. In terms of the machines, the company sets great store by user-oriented development, as well as cost-effective production of high-precision workpieces from a batch size of 1 through to medium-sized series of around 5,000 units. The Take 5 combined turning/milling center fulfills these requirements effectively. The structure and arrangement of the axes on this machine series results in a particularly compact design, which requires about 50 percent less space than comparable turning/milling centers. The kinematics also has a positive effect on the machine's precision. "As our customers often require simultaneous complete machining of complex components, we equipped the Take 5 with an additional milling spindle," explains electrical engineering manager Wolfgang Wiedemann.

Sophisticated multi-channel technology for turning/milling concepts

To ensure reliable control of the various axes and machining technologies, the Baden-based precision machine manufacturer is not prepared to accept any compromises when it comes to CNC technology. Several comparisons and tests revealed that the Sinumerik 840D sl is best suited to the turning/milling concept on the Take 5. It is proficient in every machining technology, can control up to 31 axes, and has ten channels as standard. This is confirmed by Wiedemann, who reports that, "The sophisticated multi-channel technology creates the perfect conditions for clear program structures, thus enabling simple programming for different technologies." The Take 5 uses five of these channels: turning on the main spindle, turning on the counter-spindle, milling, tool change and turning with the milling spindle. This enables milling and turning to be carried out simultaneously in different part programs. If necessary, a turning tool can also be fitted and clamped to the milling spindle so that various turning operations can then be carried out on the main and counter-spindles. "Our customers can carry out all of these functions flexibly with the Sinumerik CNC. Many other control system manufacturers would have problems", adds Wiedemann. Moreover, with the Sinumerik 840D sl, it is possible to carry out turning and milling operations alternately in the same channel. As Siemens consultant Klaus Steinbrücker explains: "Alternatively, the tool holder can be used sequentially across channels – i.e. from different programs. This means that all necessary transformations can be used, such as Transmit for front milling, cylinder barrel transformation for surface-area milling, and five-axis milling with dynamic orientation of the milling tool on the workpiece."



All pictures: Benzinger

The combined turning/milling center with two rotating spindles and a milling spindle is perfectly suited to simultaneous, complete machining of complex components

„We can perform all of the functions on our turning/milling center with the Sinumerik CNC. Many other control system manufacturers would have to use several control systems to achieve the same result."

Wolfgang Wiedemann, electrical engineering manager

Simple, safe operation

In practice, the Take 5's complex milling and turning programs are set-up for the most part at external workstations and transferred to the CNC via a network or USB stick. For simple programs and machine setup, users use the standard, clear control console, which is fixed to a dual-joint support arm and can be swiveled. Thanks to the user interfaces with cycle-supported screens, even technicians with little programming experience can get to grips with the system within the space of just a few days. If anything is unclear, an "electronic wizard" can be activated by means of the Help key to provide specific information. To ensure safe setup for the users, the Benzinger developers use the "Safety Integrated" function integrated in the Sinumerik 840D sl. This safety function provides reliable protection for the user, without the need for wiring mechanical and electronic circuit breakers. A further advantage is, for example, that if such a machine tool is fitted with a robot later on, it can be adapted quickly and easily. In just a few minutes, the user can create a part program that allows work to be carried out with the guard door open, that takes into account all necessary safety regulations, and that provides reliable protection against collisions. This saves on hardware, time – and ultimately, costs. ■

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