

■ KOVOSVIT MAS a.s., Czech Republic

# High Tech from the Czech Republic

With the Sinumerik-controlled MCU630V-5X vertical milling/turning center, a variety of workpieces can be manufactured with high quality and productivity

**With the simultaneous five-axis milling-turning center featuring the newest Sinumerik technology, the offerings of the Czech machine tool manufacturer KOVOSVIT MAS precisely correspond to the expectations of many users in high-tech segments of industry.**

In addition to the highest level of precision and reliability, high-tech industry segments such as automotive, energy, aviation and medical part production also expect the best possible offerings in terms of price/performance ratio. The goal of KOVOSVIT MAS Machine Tools, based in the Czech town of Sezimovo Ústí, is to meet these expectations. The company has been developing and building machine tools since 1939. With its roughly 550 employees, it is today one of the leading manufacturers in this sector in the Czech Republic. According to Martin Volny, head of marketing at KOVOSVIT MAS, this achievement was not easy, but it was worthwhile. He explains: "We managed to more than double the revenue per employee in the last five years. This makes it clear that we pay attention not only to the productivity of our machines, but also to our own productivity."

In addition to logistical and structural improvements within the company, the decisive factors for this successful development were first and foremost technical refinements that provided for increasing sales figures. For example, the Multicut multi-functional CNC turning/milling series has represented a continuously growing share of sales. These machines, controlled by Sinumerik 840D, can completely machine complex parts with various technologies – from turning, milling, and drilling to thread cutting and hobbing to grinding. Even measurement functions are integrated.

The sales figures for the MCU630V-5X vertical machining centers, which are designed for simultaneous five-axis machining, have developed just as positively. These machines, equipped with the modern Sinumerik 840D sl CNC, have been selling

**»Thanks to Sinumerik Operate, our customers can easily program and set up milling, drilling, turning and other machining tasks. The Sinumerik MDynamics technology package also allows the highest surface quality and precision to be achieved with even shorter machining times.«**

Miroslav Kopal, Head of Electrical Design, KOVOSVIT MAS a.s.



Photo: KOVOSVIT MAS a.s.

successfully since 2007. Marketing head Volny names the domestic Czech market and Russia as the sales focus of the past two years. The latest versions of these machines have also increasingly drawn the interest of manufacturing companies in Western industrialized countries. Miroslav Kopal, head of electrical design at KOVOSVIT MAS, explains the reason: "Together with several companies and scientists at the university in Prague, our developers saw to it that the new MCU630V-5X would have an optional 500 min<sup>-1</sup> fast C axis. In addition to milling, drilling, rubbing and thread cutting, it can perform real turning work in one clamping when equipped in this way. In addition to a great deal of flexibility, this results in especially high manufacturing precision and productivity, above all for highly complex workpieces."

### User-friendly operation with Sinumerik Operate

For such a powerful machine, the developers did not want to make any compromises in the area of control and drive technology. The decision was made in favor of Siemens for several reasons: a good partnership had existed between the two companies for more than 50 years, and Kovosvit was a pilot partner for the Sinumerik 840D sl and was already very familiar with this CNC from roughly six years of use. According to electrical design head Kopal, the technical possibilities of the control system and the high level of user-

friendliness and usability were even more important. With Sinumerik Operate, Siemens developed a new operating and programming structure that includes typical PC functions such as "copy and paste," among others. Kopal explains: "We use the new user interface in the application technology as well, and our employees tell us again and again that it can be worked with in a very intuitive manner. They feel almost as at home as on their own computers."

For programming and workpiece setup, three different programming modes are available for Sinumerik Operate: ShopMill as graphically supported work-step programming, programGUIDE as G-code with cycle support, and pure DIN/ISO programming. If the user decides in favor of ShopMill, he or she can make use of graphically animated step chain programming. It is structured in a self-explanatory manner so that even technicians without programming experience can quickly learn to use it. If the user programs in programGUIDE, he or she needs G-code knowledge. Supporting cycles and animated photos that simplify programming are also available here.

Because the new MCU630V-5X is designed for complete machining, the operator must be able to both program and setup milling, drilling, turning and other machining tasks. Providing an overview is of central importance here. "Sinumerik Operate displays the overview in an exemplary manner,"





The employees of Kovosvit appreciate the clear representation of milling and turning tools

► confirms Kopal, and gives an example: “In order to access the required tools, Sinumerik Operate offers a clearly structured tool list that can give the operator all relevant data at a glance. All turning and milling tools can be placed on one page and are easy to recognize by their icons.”

It doesn't matter whether a PCU (power control unit) or a TCU (thin-client unit) is used behind the operator panel. The display of the user interface is always the same. Which solution the end user decides to use depends primarily on whether he or she wants to use additional Windows application programs and needs the PC for them. If not, he or she can choose the lower-priced TCU solution, which is also smaller and lighter.

### Using Sinumerik MDynamics to get the best surface quality as fast as possible

The Sinumerik MDynamics technology package, which is also used in the MCU630V-5X, is of great importance for complex five-axis machining in particular. It allows the highest surface quality and precision to be achieved with even shorter machining times. Jiří Urban and Eva Klocova, Siemens engineers who oversee projects in the Czech Republic, explain the technical background: “The crucial basis for this is the new intelligent Advanced Surface motion guidance, which has an optimized look-

### Highlights of the new MCU630V-5X

- Simultaneous five-axis milling and turning
- Stable machine bed made from gray and nodular cast iron from the company-owned Kovosvit foundry
- Portal machine concept with vertical machine structure
- Directly driven with swiveling/rotary table in swivel axis with  $25 \text{ min}^{-1}$
- Fast C axis with  $500 \text{ min}^{-1}$
- Direct distance measuring system
- Positioning accuracy of  $10 \mu\text{m}$
- Repeat accuracy of  $5 \mu\text{m}$
- Flagship Sinumerik 840D sl control system with clear Sinumerik Operate graphical user interface
- Sinumerik MDynamics for the highest level of precision and perfect surface quality

ahead function and a new compressor, among other features. Thanks to this innovation, we can achieve reproducible results with the best possible surface quality, with exact contour precision, and with the fastest possible machining speed.” Intelligent jerk limitation is also integrated. It protects the mechanical parts of the machine by making it possible to gently accelerate and brake the axes despite extreme dynamics.

But Sinumerik MDynamics offers users even more. For example, the measurement functions in JOG were improved in order to further simplify the setup of the machine. There is also a 3-D simulation that supports programming and the calculation of quotations. Siemens engineers have also further developed a variety of high-speed cutting (HSC) functions. For example, the Cycle832 High Speed Setting can be used to quickly adapt the machining strategy, and with the new Cycle800 swivel cycle, even complex workpieces can easily and quickly be prepared for machining in one clamping – both in JOG and in automatic mode for complete machining. ■

info  
contact

[www.siemens.com/sinumerik](http://www.siemens.com/sinumerik)  
[wolfgang.reichart@siemens.com](mailto:wolfgang.reichart@siemens.com)