

■ **Kraft Maschinenbau GmbH, Germany**

# 5-Axis Milling in a Class of Its Own

**Sinumerik 840D ensures maximum productivity thanks to modern CNC features in a new 5-axis machining center for wood, plastic, and aluminum.**



**K**raft Maschinenbau GmbH in Rietberg, Germany, specializes in machines and plants for the wood and furniture industry. The company's latest development, the Sinumerik 840D sl-controlled "penta GK" 5-axis machining center for wood and plastic processing, took just one year from the first design drawing to the deliverable machine. "This was only possible with consistent project management and a good project team," explains project manager and sales engineer Joachim Müssig. "Siemens also provided us with excellent support on the electrical and automation engineering side."

## Flexible application in many situations

The penta GK 2010 and 3015 machines meet all the requirements of plastic processing and model and mold building, and many features offer substantial productivity advantages – for example, they allow 3+2 milling strategies and are suitable for simultaneous fivefold tasks. Here, the milling tool is guided relative to the component surface in five degrees of freedom by the integration of two rotational round axes in addition to the Cartesian linear axes. This enables optimum tool engagement ratios to be achieved continuously. Thanks to the free geometrical orientation of the tool axis, the tool geometry can cling optimally to the contour. This allows much shorter machining times than conventional milling techniques with comparable surface qualities. The machining centers achieve an accuracy of 0.05

millimeters at the tool tip and are designed as crane hook machines. "We can place them wherever the customer wants with a crane," says Müssig. "They are ready to use after just one day's installation work." A measuring probe for tools brings additional savings potential. Because it can be operated as standard by the Sinumerik 840D sl, a small company can save the costs of a separate tool set-up device.

## User interface with Windows look and feel

In order to be able to fully exploit the mechanical design, the CNC must offer the best possible performance. Kraft Maschinenbau was soon convinced that Siemens was the partner the company wanted.

## Tandem Operation thanks to Safety Integrated

The penta GKs are equipped for tandem operation. If components take up less than half the processing space, half the space can be used for setting up and the other half for machining at the same time. This is possible because safe cams installed by the Sinumerik Safety Integrated software tool impose a safe speed limit, the so-called Safe Speed.



The machining center achieves an accuracy of 0.05 millimeters at the tool tip



Photos: Kraft Maschinenbau

**»The Sinumerik Operate user interface and the Sinumerik MDynamics technical package are excellent additional features of the Sinumerik 840D sl.«**

Andreas Wapelhorst, Technical Manager at Kraft

“The Sinumerik 840D sl achieves top results in set processing and block cycle times,” technical manager Andreas Wapelhorst explains. “And the Sinumerik Operate user interface and Sinumerik MDynamics technical package are excellent additional features. “The new user interface is similar in many ways to that of a normal PC and can be operated largely intuitively. The explorer structure enables the screen to be divided and to keep several windows open at once. In addition, there are practical functions such as copy and paste and the familiar key combinations such as Ctrl+A for “select all.”

Sinumerik Operate gives users a choice of three programming methods: ShopMill with its self-explanatory, graphically animated interface for simple, workshop-oriented work-step programming, programGuide as cycle support and G-Code programming by DIN/ISO and Sinumerik high-level language. Thanks to the clear structure and representation in ShopMill, technicians without programming experience are able to write a reliable, functional program in a short time. If the operator programs in programGuide, he or she needs G-code language knowledge. This method pays off especially for larger series, because optimum processing routines can be written for very high machine productivity. With DIN/ISO programming, experienced professionals can tease the last few saved seconds out of a program.

**New cycles for higher productivity**

The new Sinumerik MDynamics technology package enables maximum surface quality and precision in even less processing time. The basis for this is the new intelligent Advanced Surface motion guidance with an optimized “look ahead” function, among other things. This always ensures optimum speed and productivity.

The right processing strategy for the required surface, especially for aluminum, can be set quickly and easily with High Speed Setting Cycle832. The kinematics of the machining head can be measured, for example, after a crash, with Cycle996. It can then be determined in a few minutes whether the head kinematics are still within a fixed tolerance. In this case, the detected error value can be transferred directly so that the machine can carry on operating without losing any more time. Without Cycle996, the machining head would always have to be adjusted by a service technician. ■

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[www.siemens.com/sinumerik-mdynamics](http://www.siemens.com/sinumerik-mdynamics)  
[ingo.bartsch@siemens.com](mailto:ingo.bartsch@siemens.com)