



Siemens AG

Once turning work is complete, the Rotamill can switch automatically to an NC milling head or a grinding head for the next machining steps

Cytec Zylindertechnik GmbH, Germany

Multiple machining in one clamping fixture

Cytec Zylindertechnik uses a hybrid machining center with an innovative interchangeable head system in mold and die construction. The premium Sinumerik 840D sl CNC ensures rapid switching between machining processes.

The development and construction of key components for the machine tool industry have been the focus at Cytec since the company was established around 30 years ago. The German company was initially involved mainly with cylinder technology but then grad-

ually expanded its range of products to other components. The company made yet another technological leap after establishing a partnership with the German machine tool constructor Edel. This culminated in the development of the Rotamill hybrid center.

Stephan Weuthen, managing director of Cytec Zylindertechnik GmbH, says with conviction, "The future of mold and die construction lies in complex hybrid machining. Tools and molds are becoming increasingly complicated and must meet the highest requirements

with respect to precision. This can be achieved reliably and productively only if the workpieces are produced in one clamping fixture." This is possible only with machines that in addition to simultaneous five-axis milling can perform turning and grinding tasks. The new Rotamill hybrid machining center controlled with Sinumerik 840D sl is designed to do just that. Weuthen explains, "The Sinumerik 840D sl CNC is perfect for us, and together with experts from Siemens we carried out all the application adjustments within a year."

High-precision turning thanks to innovative machines and control technology

The emphasis in mold and die construction is on milling technology. It is frequently necessary, however, to carry out additional turning tasks that place maximum demands on roundness and precision. It used to be necessary to spend precious time reclamping on separate turning machines to do this. Loss of accuracy then went hand in hand with disadvantages in terms of productivity and cost. Not so with a hybrid machining center such as the Rotamill. Constructed in vertical portal design, the machine cell is extremely rigid. The Rotamill is very flexible due to its large traverse paths, and thanks to the high feed force in the linear x, y, and z axes and its high speed values, it is also highly productive.

The direct-drive turning/milling table integrated into the machine bed achieves speeds of up to 200 min⁻¹, thus creating the important basis for additional turning and grinding operations. It has a central through-hole that can be used for clamping cylindrical workpieces. Cytec has solved the challenge posed by the high lateral torques that occur when machining with turning tools in two ways: the high-speed bearings of the milling head are stabilized with a spindle clamp and three interchangeable heads are integrated in the Rotamill. A tool station can be fitted with a real turning spindle for any turning operations. Very high levels of roundness accuracy are achieved as a result when turning. Weuthen explains, "It is now very easy to switch from one machining head to



The Sinumerik 840D sl CNC enables changeover from one machining head to another in less than one minute

another." The change can be stored in the CNC program of Sinumerik 840D sl – it then runs automatically in less than a minute. Managing director Weuthen is pleased to report, "At present, only Siemens is able to supply this key function, which makes working with the Rotamill extremely easy. We were also immediately impressed by the latest technology features, such as the Sinumerik Operate user interface and the Sinumerik MDynamics milling technology package." For example, Advanced Surface, with the high-speed cycle Cycle832, which is included in Sinumerik MDynamics, is the perfect complement to Cytec's interchangeable head system. The operator can use it to achieve the optimum combination of service quality, machining speed, and accuracy at all times.

Uniform user interface maps milling and turning tasks in a similar manner

Thomas Paulsen, assembly manager at Cytec Zylindertechnik GmbH, also sees the new user interface by Siemens as a clear advantage: "Sinumerik Operate is integrated and clearly laid out – a factor that is very important, particularly for hybrid machining centers. Ultimately,

the changeover from milling to turning makes great demands on the know-how and imagination of the machine operator." With Sinumerik Operate, the operator has a choice of various programming methods and can switch back and forth between them at will: ShopMill, programGuide, and ISO code – this is an advantage for hybrid centers such as Rotamill, as all the milling and turning cycles are available in programGuide. The skilled operator is also supported by graphical displays and animations. Sinumerik Operate, for example, offers a structured tool list that can be individually configured by the user. If the user nevertheless selects an inappropriate tool, the error is displayed via active technology monitoring, and he or she can correct it immediately. ■

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