

Haas Schleifmaschinen

■ Haas Schleifmaschinen GmbH, Germany

Modular Potential

The Sinumerik 840D solution line has made customized grinding solutions based on standard modules a reality.

Increased precision and even higher productivity were the features stipulated in the development specifications for the next generation of grinding machines for grinding media with a diameter of up to 400 millimeters, which will complete the range of customized grinding solutions provided by manufacturer Haas Schleifmaschinen from Trossingen in Baden-Württemberg, Germany.

The innovative grinding machines manufactured by Haas are supplied primarily to the tool industry, the medical sector and the automotive industry. The flexibility achieved when five- and six-axis grinding is used to machine free-form surfaces and complex contours now makes it possible to grind parts that previously had to be produced by free-form or rotary milling. The large-scale degradation behavior of the grinding media and the excellent surface quality achieved in an extremely short machining process allow a huge amount of time to be saved when producing parts.

Grinding system modules...

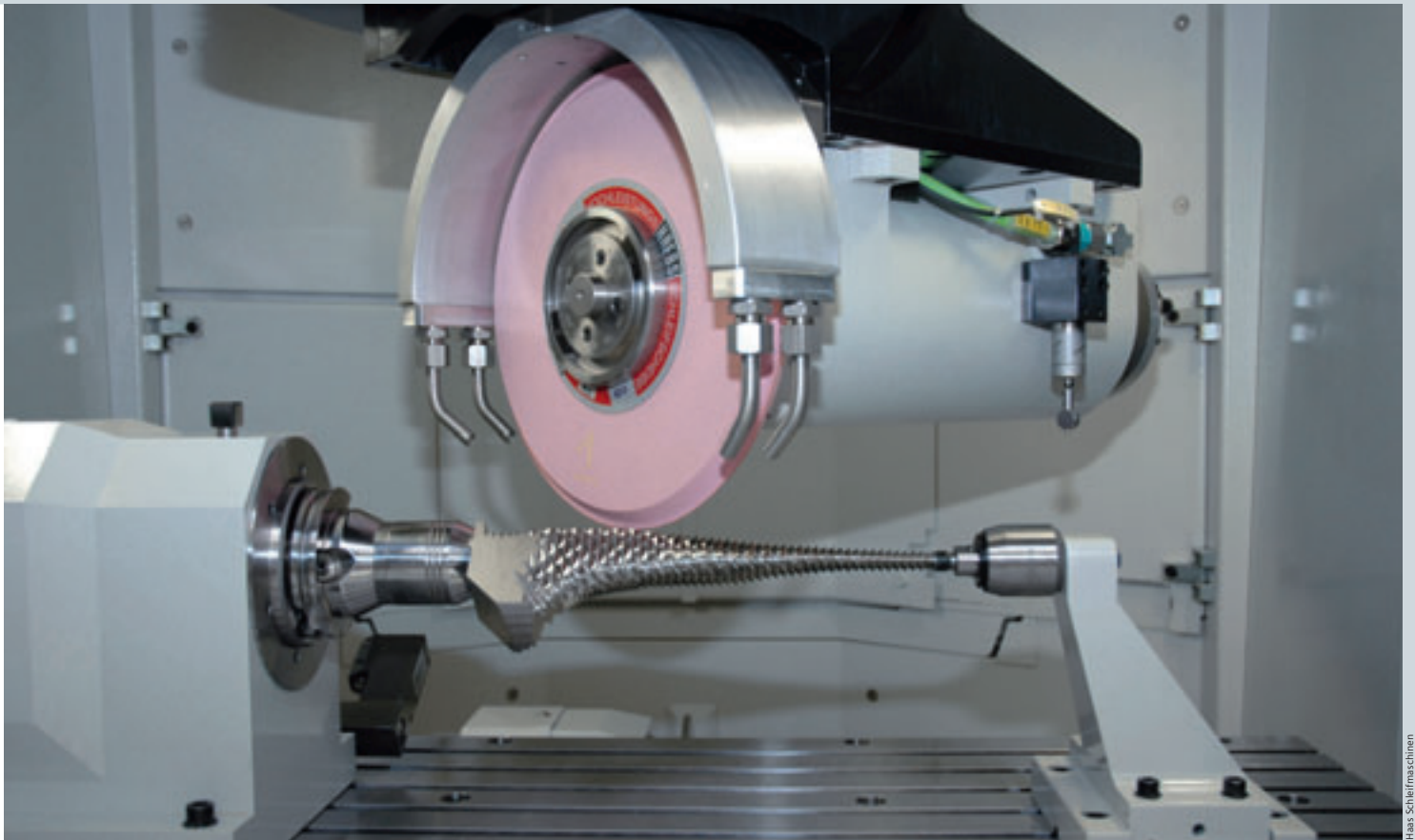
The new Multigrind CB range has a completely modular structure and features a system module of scalable components developed by Haas. The basic modules alone enable approximately 2000 different machine configurations to be setup, so a machine can be engineered extremely quickly. The construction process

for standard modules is also highly efficient, meaning that Haas can implement customized solutions in a similarly short period of time.

...with accompanying automation systems

A machine design this flexible requires an equally flexible automation system. The architecture of the new Sinumerik 840D sl supports flexible engineering. Used in conjunction with the Sinamics S120 drive, this new generation of CNC machine simplifies commissioning and service through the universal and consistent use of electronic type plates for motors, drives, and I/O modules. The standard industrial Ethernet-based communication in the control system allows seamless vertical integration in all production environments. At field level, the industrial Ethernet-based Drive-Cliq drive interface maintains this communication up to drive level. If the automation system is to provide the user with all the benefits of grinding, it must cope not only with the demands on the tool guide for a standard five-axis turning or milling process, but also with the complex technicalities of grinding.

Haas uses its own programming system to ensure effective application of its process expertise to the user's production process; this system has been integrated into the user interface via the open Sinumerik 840D sl system interfaces and allows grinding re-



Haas-Schleifmaschinen

quirements for machining to be met simply and efficiently. The system uses mathematical algorithms for five-axis machining, calculates the required transformations and performs a collision test. Haas is planning to integrate additional simulation functions into its programming system to enable even more realistic NC program tests; the developers will be able to use the virtual NC kernel available to the Sinumerik, which provides a completely realistic simulation of the control system's dynamic behavior. "Sinumerik's functionality and the open access to all the system interfaces make it infinitely easier for us to implement our grinding solutions," remarks leading designer Hans-Dieter Braun.

The same drive components for every axis

The Multigrind CB's cubic one-piece cast mineral machine base forms the basis for an extremely robust design with excellent thermal properties. This basic design and the reduced bending and tilting moments enable higher servo gain factors on the drives, allowing the high dynamics of the Sinamics S120 drives used by Haas to be fully converted into productivity and production precision. Furthermore, the mechanics are coordinated in such a way that all NC axes on all scales can be operated with a single type of motor and the same rated power: the new 1FT7 synchronous motor with a rated power of 3 kilowatts, which offers particularly smooth operation and very easy maintenance thanks to its replaceable encoder. The effects of standardization and the reduced need to stockpile spare parts benefit not only Haas but also the end users and operators.

Reduced servicing costs

Reliable automation technology, combined with consistent remote diagnostics has already reduced service costs considerably. In addition to the improved remote diagnosis options, Haas plans to offer its customers an increasing range of electronic services to increase productivity. This will not require any additional software development, as services suitable for machines automated with Sinumerik are supplied by ePS Network Services. Managing Director Dirk Wember sums up the synergy effects of the system

The Multigrind enables extremely fast grinding of workpieces that could previously only be produced by mill-turning

» **The open access to all the system interfaces helps us implement our grinding solutions.** «

Leading designer Hans-Dieter Braun

modules that Haas uses for mechanics and automation systems as follows: "Our business model is successful because modularity and standardization are now available in the areas of mechanics, automation systems, and software. Our consistent use of this is making us faster and, therefore, stronger." ■

info

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