

Sixth axis brings a new dimension to grinding

HAAS Schleifmaschinen GmbH from Trossingen did not only present its two MULTIGRIND® grinding machine ranges at AMB 2008. The company also showcased a brand new add-on module which can be used to produce an optional sixth grinding axis on all machines, making possible a new dimension in grinding. The new module was developed to machine turning inserts and carbide tools for lathing.

The south German grinding machine specialist sees it as only natural that it should supply its universal grinding machines as complete solutions, tailored exactly to the machining tasks carried out by each customer. This allows the customer to undertake grinding work in which highly complex geometries can be produced with sequences of different grinding tasks on the one grinding machine, in one session and in one chuck setting. This has several positive effects. There is no need for tensioning and releasing, tooling times are cut and productivity rises.

An optional sixth axis, which HAAS exhibited for the first time at the metal working exhibition in Stuttgart, is now bringing an extra degree of freedom to the HAAS grinding machines. The extra feature of a sixth axis, which is clamped in the A-axis, allows the tool to be pivoted by ± 45 degrees. A new kind of clamping mechanism holds the tool securely in position and prevents the fixture bending up, making all-round machining of complex workpieces possible.

The extra module was developed for machining multi-blade turning inserts for lathing. These inserts are used to cut contours or threads in cylindrical metal parts on the lathe. The inserts are triangular in shape and the corners, which represent the actual cutting tool, may have complex geometries. Such tools are ground in three steps. Firstly surface grinding of the flat top and bottom, then peripheral grinding of the insert edge to produce a clearance angle before finally contour grinding of the corner blades. Previously, these processes had to be undertaken on different machines or special machines built especially for these turning inserts. Now one universal grinding machine can cover virtually all machining tasks in this field. The machining cycle is rounded off by the automatic insertion and removal of tools by a robot.

The sixth axis was developed especially with the MULTIGRIND® AF series in mind.



This is a rapid grinding centre for precise machining and for regrinding rotary and profile tools as well as gear cutting tools and hob cutters. HAAS' compact machine occupies a floor space of just five square meters, enabling it to fit in any production layout. The tool changer provides space for four to six grinding wheels, which can be replaced in around ten seconds if necessary.

The latest HAAS range, the MULTIGRIND® CB, was also on show at AMB. The technology behind the MULTIGRIND® CB is

based on a kinematic arrangement of all five axes in which the grinding wheel is positioned in the machining centre of the C-axis and in the centre of the machine base. This enables the workpiece to be accessed perfectly. The rotary axes have a maintenance-free direct drive with high levels of dynamism, rigidity and insensitivity to crashes. Depending on tool size, automatic loading and unloading is handled by robots or handling equipment with linear motion, so operating staff are not needed.



The new MULTIGRIND® CB series is characterised by larger axis lengths of 700 x 410 x 500mm and thereby also allows larger and more complex workpieces with a diameter of up to 340mm to be ground as standard. A tool changer for up to 17 grinding wheels with diameters of up to 300mm greatly extends the machine's scope, when compared to previous machines. The CB range is equipped with the latest controller generation in the form of a Siemens Sinumerik 840 DSL.

Both machines can be fitted with the sixth axis at any time if the specific machining task at hand requires it.

HAAS manufactures universal grinding machines which can machine the complex geometrical forms required for various components. Customers who buy a HAAS grinding centre acquire a sophisticated all-in-one solution for their grinding tasks, right from the software for grinding and simulation tailored to the workpiece, through to fully automated machine loading and unloading. The grinding centre enables efficient, cost effective production of a vast array of workpieces: rotary and profile tools, gearing and cold forming tools, medical implements or medical implants.

All HAAS machines have five axes and a grinding wheel changer and are characterised by their high degree of rigidity and stability. "Dressing and truing" or profiling of the grinding wheels occurs while the workpiece is being ground in the machine. The grinding spindle at the heart of the machine, is produced and developed by HAAS, as are the rotary and NC axes, the clamping devices and the grinding software. Extensive vertical integration of processes at HAAS ensures perfect matching up of individual components, and that interface issues are strictly controlled. With HAAS grinding machines, customers are assured of achieving precision, quality and cost effectiveness in their production. Around 60 percent of all HAAS products have been

developed within the last three years, a strong indication of the high value the company places on innovation and development. HAAS produces three machine lines: MULTIGRIND® AF, MULTIGRIND® HT and MULTIGRIND® CB covering a range of machining tasks. MULTIGRIND® HT is a high-precision grinding centre with which medical components and rotary and profile tools, gearing tools and components as well as cold forming tools can be efficiently and cost effectively produced. The technological basis

of the MULTIGRIND® HT is a kinematic arrangement of all five axes in which the grinding wheel serves as the turning centre. Accessibility to the machine is thereby optimal and the workpiece can be completely machined with a single chuck setting.

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We have basically always been curious individuals. Which is a good thing. It ensures that our development is always a step ahead. The MULTIGRIND® CB is the fastest grinding machine we have ever built. If you are curious and want to know about all the advantages the tool changer comes equipped with, then you should put this machine to the test. You will see that it is especially suited to highly demanding series production.

GRINDING WITH ATTITUDE!



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