



■ **HSC Medical Roadshow**

Where Precision Meets Strength

Siemens and its partner companies demonstrate new production solutions for the medical engineering sector.

Medical advancements in recent decades have led to a considerable increase in life expectancy. According to demographic predictions, almost one third of the population of western industrialized nations will be over 60 years old in 20 years' time. This trend will see additional emphasis placed on maintaining quality of life into old age, which will in turn call for an increasingly comprehensive range of healthcare services.

High-precision implants

Innovative treatment methods and implants play a major role in increasing life expectancy and quality. Production of hip and knee joints, spinal segments, shoulder and elbow joints, dental bridges has now become a key economic and competitive factor for the medical engineering sector. Implant manufacturers are expected to supply products with increasingly high levels of quality and precision, which is duly reflected in the manufacturing costs. At the same time, they have to make their processes and work steps faster, simpler and more flexible right through to the finished product, while still keeping an eye on the costs involved.

As a result, efficient production methods – in particular high speed cutting (HSC) – are in great demand in medical engineering. This high-tech equipment allows implants to be machined and completed with maximum speed and precision, thereby reducing costs. The international roadshow starting at the Euromold trade fair in Frankfurt on December 3, 2008, aims to demonstrate the versatility and perfor-

mance potential of solutions for medical engineering. Working under the slogan “Top Team 4 Medical Devices – HSC Medical Roadshow,” a number of Siemens divisions will be working together with various partner companies and showcase “live” demonstrations of the planning, development, simulation and manufacture of implants throughout the process chain, from diagnosis to finished products.

The new force behind high speed cutting

The first step in the process is to calculate patient-specific implant dimensions using medical imaging methods such as computed tomography, preoperative implant molding and 3D image processing, which provide the basic information for modeling the required implant. The NX solution from Siemens PLM Software allows the generated tool paths and functions to undergo virtual testing under machine conditions, while the modeling and programming phases are still in progress. This simulation and verification of the production processes within a digital environment increases process reliability during subsequent production.

If the program describing the manufacturing steps for the workpiece meets the requirements, it is entered into a Sinumerik 840D sl CNC and processed. The CNC system is especially equipped to meet high-speed cutting requirements. The interaction of functions enabling simple measurement or calibration of multi-axis kinematics, jerk limitation, pilot control, look-ahead, and tracking of tool orientation allows optimum utilization of technology and adaptation to ►►

► changing requirements in CNC production. This guarantees high dynamics, precision, flawless surfaces and maximum production speed. Furthermore, the ShopMill operating and programming software is simple to operate and extremely user-friendly, allowing the workpiece to be set up and measured easily. The multi-axis kinematic analysis means that even the slightest errors can be corrected while the machine is running. The “Safety Integrated” safety solution provides comprehensive protection for man and machine. The software can be used to connect emergency stop buttons and light barriers. If any operating errors occur, dangerous movements are brought to an immediate standstill and the power to the motor is quickly cut.

Much shorter setup times

The roadshow presentation features a Sinumerik 840D sl controlling and monitoring high-precision production of artificial knee joints on a highly dynamic HSC 20 linear milling center from DMG’s HSC range. The range of functions offered by the model makes it particularly suitable for use in the medical technology sector. It is equipped with linear drives on all its axes and achieves acceleration rates of over 2 g. The model can also generate a surface finish of up to Ra 0.2 µm. The liquid-cooled machining spindle operates at speeds of up to 42,000 rpm and opens up an extensive range of potential applications in the medical sector, in which materials such as titanium, chromium molybdenum, tantalum, and niobium are milled.

In order to achieve maximum precision during implant manufacture and to ensure consistently high product quality, measurements must be taken continuously both from the machines and from the workpieces. During the roadshow, Renishaw GmbH

will demonstrate how to fit HSC production machines with suitable measuring probes and how to use solutions to measure tools, detect broken tools, and set up and measure workpieces. Employees will show how targeted use of measuring probes can reduce setup times by up to 90 percent and improve process control.

Cost-effective structuring of production processes

Another roadshow partner is ISCAR GmbH, whose product portfolio includes turning, drilling, milling, and finishing tools and tool holding systems. The products presented by the machine tool manufacturer will include vibration-free carbide milling cutters that are ideal for cost-effective machining of implant materials.

Contacts from the relevant Siemens divisions and the various partner companies will be on hand during the individual Roadshow-events to answer questions and take part in discussions. Expert debates will provide visitors with in-depth information not only about the various solutions, products and programs, but also about the demands placed on the products by surgeons in practices and hospitals. Last but not least, the roadshow will provide the perfect platform for suppliers and users from the medical technology sector to share ideas and experiences. ■

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Highlights of the Sinumerik 840D sl CNC

- Impressive functionality; extremely user-friendly for easy setup and measurement
- Excellent motion control and highly dynamic drives guarantee flawless workpiece surfaces
- Maximum precision with multi-axis kinematic analysis and optional correction of even the slightest errors while the machine is running
- Perfectly customized Siemens PLM post processors with NX CAM ensure a coordinated process from the original idea through to the finished workpiece