



Picture: Zoller

Synthes has a worldwide reputation as a leader in surgical instruments and appliances for operations.

Preset for precision

Components in medtech applications are becoming ever more intricate and delicate – while production tolerances continue to contract. Quite apart from that, materials finding use in medtech are difficult to machine in production, requiring a particular level of expertise. Despite these mounting challenges, medical device producer Synthes – market leader in the fields of osteosynthesis and maxillary and spinal surgery – has succeeded in appreciably stepping up both productivity and quality. Special presetting and measuring machines play a significant role in this.

Based in Tuttlingen, in the Swabian region of Germany, Synthes is a globally leading company in the development and production of implants and instruments for traumatology, spinal, oral and maxillofacial surgery. The company has set its sights on a particular goal – designing the production of medical instruments to be more flexible and more productive, while keeping within quality guidelines. Constantly recurring cycles in connection with small batch sizes is a key feature of production operations in Tuttlingen. In addition, in 2008, the company began

producing complex rotational parts. This necessitated investment in a universal presetting and measuring machine to cover the dimensioning of both milling and lathing tools. The aim was to use this presetting and measuring machine to cut tooling times and error rates and increase machine run times measurably.

This procedure proved to be very complex and time-consuming, particularly with respect to tools for the long bed lathes, because the more intricate the rotational parts, the greater the importance of dimensioning and setting

the centre height. This prevented the universal presetting and measuring machine from being employed for other tasks. This situation was plainly unsatisfactory, especially as Tuttlingen has approximately 15 machining centres for each of the 3-axis and 5-axis ranges and several complex long bed lathes and consequently a great many tools are in use. This situation prompted the Synthes decision-makers to invest in Zoller presetting and measuring machines. The types procured were a 'venturion 450' for milling tools and a 'hyperion' for lathing tools.

Today, a work folder is set up for each work order and a unique identification number is assigned to each tool. This means that all the relevant tool characteristics, such as overhangs for collision avoidance, parts lists for the tools etc. are clearly defined and stored. The actual tool data is measured and loaded on to a server by the Zoller pre-setting and measuring machines and then transmitted straight to each machine. Whereas in the past, tool pre-setting was carried out by each machine operator, these days tool trolleys are set up from the measurement and pre-setting room. This has made it possible to schedule almost all tool set up operations for non-productive times.

Error rate was cut by 80 percent

Wolfgang Ley, five-axis manager, describes the productivity gains achieved in the following terms, "This switch delivered huge time savings. For example, at present four to six tool trolleys can be set up with approximately 20 to 30 tools per shift in the measurement and pre-setting room. This is in addition to the tools that need to be replaced during continuous production because they've reached the end of their working lives or for other reasons. A further advantage was the cut in the error rate, because loading tool data straight on to the machines has definitely cut this by 80%."

As regards long bed turning, even more time is saved than with milling tools. This is because the 'hyperion' pre-setting and measuring machine can preset tool data conveniently and reliably to the centre height, prepare the data and transfer it in seconds to the machine controls. Processes are reliab-



Between 20 and 25 tools are set up per tool trolley. So tooling can be assigned to non-productive times.

le, reproducible and ensure compliance with all mandatory documentation requirements. 100% documentation of all stages in the process chain is naturally of great importance in medical technology. Over 60% of the products go to the parent group in the USA.

As Walter Seeh, production manager at Synthes Tuttlingen GmbH explained: "Product liability is taken very seriously in the USA. This makes evidential documentation on the entire production process an absolute must. One of the reasons why we have such a high regard for Zoller is that the pre-setting and measuring engineering of the tools is the first link in the process chain and thereby provides perfect conditions for dimensionally stable products with excellent surfaces. These are ideal conditions for the machine to deliver perfect

German Summary

Bauteile in der Medizintechnik werden immer filigraner, die Fertigungstoleranzen schrumpfen weiter. Unabhängig davon erfordern schwer zerspanbare Werkstoffe in der Produktion der Medizintechnik entsprechendes Know-how. Trotz dieser steigenden Anforderungen ist es dem Medizintechniker Synthes als Marktführer in der Osteosynthese sowie in der Kiefer- und Wirbelsäulenchirurgie gelungen, die Produktivität bei zunehmender Qualität messbar zu steigern. Wesentlichen Anteil daran haben spezielle Einstell- und Messgeräte. Der deutschsprachige Beitrag ist nachzulesen auf www.meditec-international.com/medi0212zoll

parts right from the start." Also - the consistent trend towards ever smaller instruments demands even greater standards of precision from production. Currently, geometric tolerances, angles and parallelisms are measured at below two hundredths of a millimetre.

The fact that in Tuttlingen the milling tools are preset and in perfect condition when they reach the machines and that down times between the previous and next work order have been cut appreciably is due in no small measure to the 'venturion 450'. This is a pre-setting and measuring machine more or less custom-made for medical technology because it can be configured ideally to suit the production sequences in medical technology.

In Tuttlingen, Synthes produces approx. 700 articles in the 5-axis range and approx. 300 in the 3-axis range. A volume like this needs some management. However, skilled staff are practically unavailable, at least in the Tuttlingen area. This is why all relevant employees were involved in the development of the concept with the tool trolley, work card and installation of the Zoller pre-setting and measuring machines. There are obviously numerous reasons why the company opted for Zoller's benchmark pre-setting and measuring machines. Firstly, it was the absolute precision and reliability of the machines and then the staff who have already had years of outstanding experience with Zoller. Other reasons are that operation is simple and service is known to be good.



Walter Seeh (left) and Wolfgang Ley (right), "One of the reasons why we have such a high regard for Zoller is that the pre-setting and measuring engineering of the tools is the right starting point ensuring perfect conditions for dimensionally stable products with excellent surfaces."