

# Medical engineering makes heavy demands on tool pre-setting

There are things one would prefer not to get too familiar with. However, if one day one needs certain things, it may be vital they exist. The bone-screws produced by Stryker Leibinger in Freiburg (Germany), a company belonging to the Stryker Group, is such an example. Very small thread whirling tools are used on Traub and Tornos long turning automatic screw machines in order to produce special screws with a diameter of 0,8 mm. The pre-setting of these filigree tools on a ZOLLER machine is unique world-wide.

Materials that in other companies would appear exotic are standard for Stryker Leibinger. 90 % of the parts produced consist of titanium and titanium alloys, the remaining 10 % consist of stainless steels. Compared to a total production quantity of 1.8 million bone-screws per annum, the average lot size of 200 to 500 pieces appears to be rather small.



Mr Josef Baumann, manager of the implant production:

„Superior quality is demanded in the field of medical engineering and in order to guarantee this we require both, high-quality tools and an optimum tool pre-setting.“

This is on the one hand due to the enormous variance diversity of these high tech screws, on the other hand the capital lockup due to stock-keeping is supposed to be kept at a minimum. Consequently, tool setups are often required on the long turning automatic screw machines. Due to the small size of the screws but also due to other medical component parts, machine operators had always been confronted with two kinds of difficulties when setting up tools.

First it was very difficult and complicated to set the centre height of the tools precisely enough, and secondly the five cutting edges of the small thread whirling tools could only be set with great efforts, thus being very inaccurate. Finally Mr Josef Baumann, chief manager of the implant production unit decided to overcome these difficulties by using tool pre-setting devices.

### Turned parts with a diameter of 0.12 mm

After all, the smallest turned parts used in ear implants have a diameter of 0.12 mm. Therefore it is easily understandable that the centre height has to be set with a precision and repeating accuracy a machine operator can hardly achieve with a dial gauge directly mounted at the machine.

In order to find an appropriate manufacturer of tool pre-setting equipment, the production manager made inquiries upon a number of suppliers, amongst which the ZOLLER company. „We had already used a ZOLLER tool pre-setting device for our milling cutters. We deliberately approached other suppliers with our demands on turned parts in order to really find the ultimate device. In the end only ZOLLER could offer a solution for the highly precise setting to centre height. In addition to that they have also been prepared to jointly develop new solutions in order to



Basic products are bone-screws for the facial surgery and appropriate butt plates.



Standard screws are available as from diameter 0.8 mm onwards



Product line summary

harmonize the machine with our demands on thread whirling tools.

### Adaptations of stock and software

The first weeks after the purchase of a »hyperion 300« presetter were marked by united efforts towards optimisation. In order to increase operating comfort and precision a bearing was added to the tool holding fixture of the



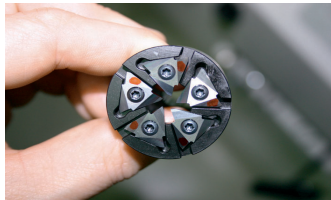
thread whirling tools. Moreover, adaptations were made in the software. Meanwhile, after two years of permanent use, the company is entirely satisfied with this solution. Mr Reinhard Hanser responsible for industrial engineering explains why: „Ever since we have started using the ZOLLER presetter, the service life of our tools has increased by 20 %. This is due to the fact that we are now capable of perfectly setting the up to five cutting edges of the whirling tools, something that was impossible before we purchased the ZOLLER presetter. Although the pre-setting of the cutters at the long turning automatic screw machine took much longer, normally only three out of five cutting edges were finally machined.

### Time is saved and quality increased

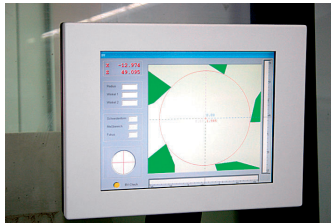
„We are now at least 15 minutes faster per setting up process than before“, Mr Hanser continues to explain. „This adds up to a considerable time saving during the day. At the same time the quality of the produced parts has measurably increased. According to our visual control and spot-test measurements our scrap rate is currently under 0.05 %. A main reason for this is the fact that thanks to the precise and reproducible tool setting process far less problems do occur during burr formation at the screws.“

### Easy handling

Only one thing could, however, still be improved from Mr Hauser's point of view: „It would be of interest for us to directly transfer the setting data from the ZOLLER presetter to the turning machines. The presetter does offer this functionality but most of our

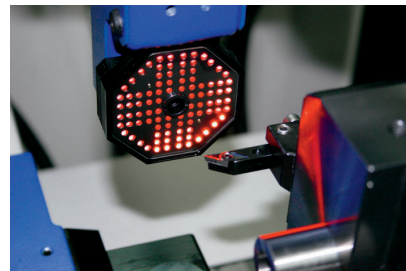


Thread whirling tool with five cutting edges



The 50-fold magnification of the »hyperion 300« tool pre-setting device allows a very precise pre-setting of cutting edges

The camera for measuring the centre height can be swivelled and is thus capable of measuring even cutting edges facing the tool holder. The special diode illumination surrounding the camera does as well provide high contrast during measurement of difficult parts.



Mr Bernd Schwennig, executive manager of the ZOLLER branch office BW Süd and Mr Reinhard Hanser, the industrial engineering manager at Stryer Leibinger responsible for creating an interface between the development department and production, have implemented the tool pre-setting solution in teamwork.



machines do not have an interface to feed in these data. Next time when purchasing machines we will make sure that a direct data transfer is possible.“ So far an adhesive label containing the setting data is attached to the tool after the pre-setting process. These data are then manually entered into the machine by the operator. Even Mr Heinz Buhl who has been working in the company as machine operator for long turning



Mr Heinz Buhl appreciates the easy handling and the time saving achieved through tool pre-setting

automatic screw machines for 13 years is very enthusiastic about it: „The presetter is easy to operate and I save a lot of time. And what is more, I do no longer have to painstakingly find out the centre height in the machine itself.“