

Clamping systems

Small investment with a big effect

In keeping with the slogan “Small investment – big effect”, automation technology specialist Weiss GmbH headquartered in Buchen, Germany, brought eight proven machine tools “up to speed”: With the help of innovative clamping devices from Marbach-based Hainbuch GmbH the company was able to drastically reduce the set-up and idle times, and simultaneously significantly increasing precision and process reliability.

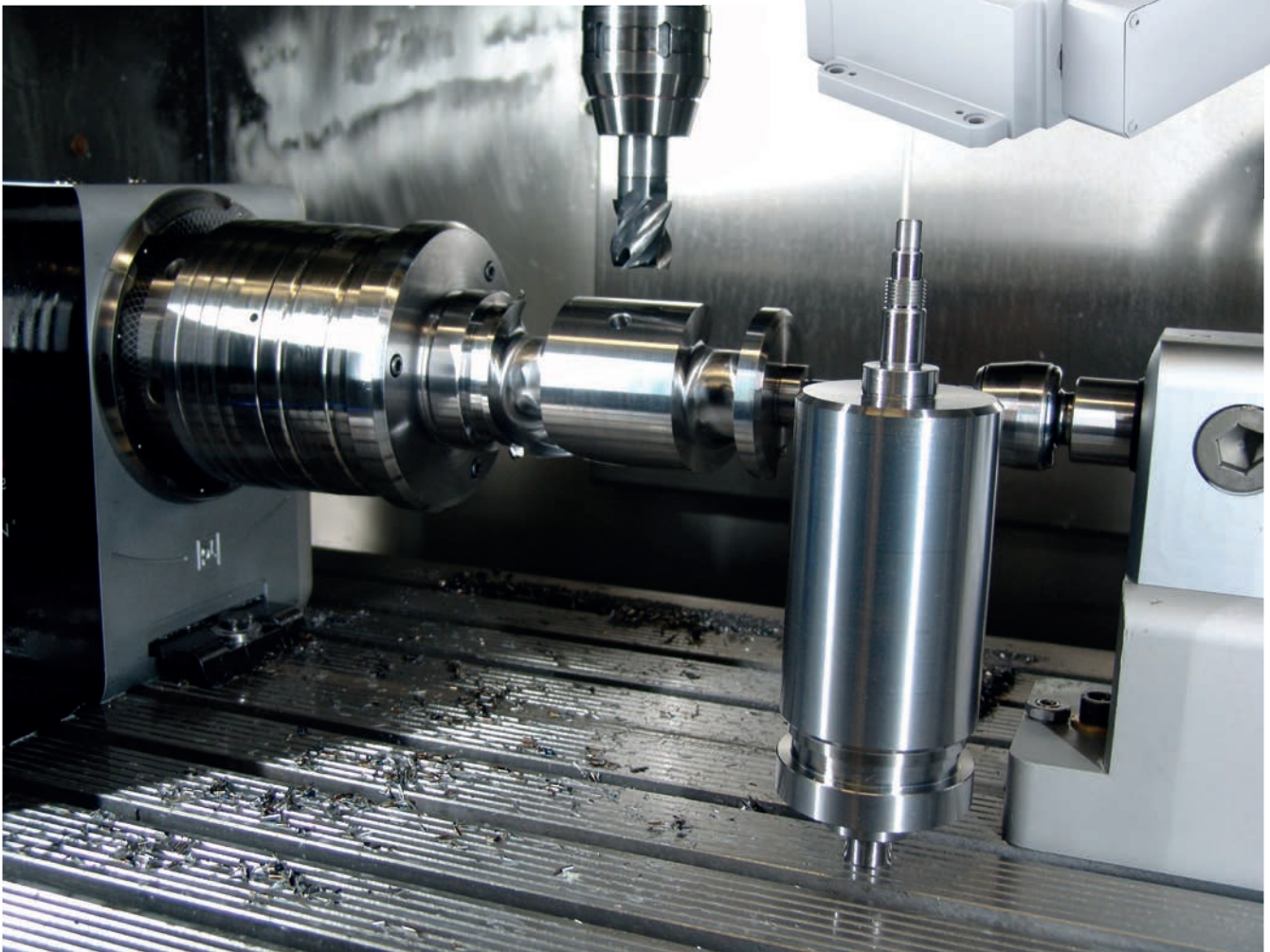
Thomas Schuster, Director of Tool Management at Weiss GmbH, explains: “The good development of recent years forced us to completely rethink our manufacturing processes.” In this regard he is aiming at more than reduction of set-up and idle times. Due to massive worldwide growth, the manufacturer of components for automation

technology located in Buchen in the Odenwald region of Germany, is working on comprehensive capacity extensions. One rewarding approach in this regard was presented to planners at Weiss for milling operation of the drive or transport cams “the heart of our rotary indexing tables”, for which soft, jerk-free, and impact-free operation, as well as long product life, are the essen-

tial attributes. These transport cams are manufactured in a variety of sizes on the company’s own machine tools. The increasing requirements could only be met with increased manufacturing efficiency. Schuster: “Set-up and idle times had to be reduced, and they had to be reduced with optimized precision and shorter machining time”.

Machining of a smaller transport cam – in the foreground the corresponding blank prior to machining.

Weiss rotary indexing table TC150: Drive and transport cams are “the heart of the Weiss rotary indexing tables.”





The quick change-over Centrotex ensures the shortest possible set-up times.

The Toplus chuck is impressive with precision and high holding forces.



Retrofitting project

Looking for new clamping device solutions at EMO Hannover, Schuster came into contact with Hainbuch, the Marbach-based clamping device manufacturer. Apparently, this initial contact at the exhibition was promising right from the start. Within a short time it resulted in a “large retrofitting project. The upgrading of eight older machine tools through high-precision clamping devices with high repeatability and high holding forces, with short set-up times”.

Analysis of the clamping situation

Together with Hainbuch Regional Sales Manager, Joerg Tittel, the existing clamping situation – conventional 3-jaw chucks – was promptly analyzed and appropriate solutions were found. The result – special customized clamping devices for the eight machines. Complete conversion was accomplished a little under one year after the initial contact at EMO Hannover 2013; looking back Schuster states “we were able to immediately generate a benefit from this conversion”.

For the smaller machines the main effect was not so much the shorter clamping set-up time, rather it was having “for the first time, the possibility of using new tools from Mitsubishi Materials (MMC) due to the high holding forces of the chucks”. On the other

hand, the most significant factor for the large machines was the significantly shorter set-up times. Thus, the complete package of innovative clamping devices and a more effective quick change-over fixture paid for itself within a very short period of time. The Toplus clamping system ensures precision and high holding forces. The Centrotex quick change-over system ensures quick change-over of the various components. Use of Mitsubishi tools in the new chucks was not a requirement imposed on Hainbuch; however, Mitsubishi Materials has been a main supplier for years and through the more rigid and precise clamping conditions “for the first time we had the possibility of using these tools in the soft and rough machining, as well as in the finish and hard machining.”

Optimal metal removal rates

The large transport cams are soft machined with indexable insert tools. Here as well, the high holding forces, the stability, and the precision of the chucks enable optimal metal removal rates. Viktor Gruslak, Acting Department Manager responsible for cam

milling states: “With the old fixtures we had set-up times of between two and three hours for a complete conversion. Now we calculate ten

to thirty minutes. We still have to align the tailstock. Replacing the Hainbuch chucks takes only five to ten minutes – even for the large ones.” Asked whether clamping device providers other than Hainbuch were contacted, Schuster responds: “At that time we were extremely thorough in looking over the offering at EMO Hannover 2013, but the Hainbuch solution was the solution that was best suited for our parts.” The trials, which were subsequently run with Tittel, “confirmed our decision lock, stock, and barrel”. On his first walk-through of the manufacturing facility, Hainbuch Regional Sales Manager Tittel, “immediately recognized the potential – and was able to reinforce his recommendations in the practical trial. When a 3-jaw chuck is converted to the Hainbuch system, at first this is unusual for some operators: “Often you do not trust yourself to increase feeds and other metal removal rates to the levels that the new clamping device allows.” An operator is indeed limited by the system pressure of the clamping hydraulics, but even when testing the limits, “the clamping device still had more to offer”.

A tip concerning the tools

The clamping technology expert had already run his trials “with tools from all well-known manufacturers and could thus give the user a tip – and for hard milling the Mitsubishi tools are simply some of the best on the market”. However, in the normal case the customer

Quote

“Through the new clamping devices alone, we are saving 15 minutes of set-up time per piece – this is one hour per shift.”
Thomas Schuster,
Weiss GmbH



A project such as this can only be executed with reliable partners, who like ourselves also focus on integrating the employees (from left to right): Ullrich Jüngert, MMC; Joerg Tittel, Hainbuch; Thomas Schuster and Viktor Gruslak, Weiss.

Profile Weiss GmbH

Weiss GmbH has specialized in the development and production of components for automation technology since 1967. Today the company is one of the leading manufacturers of automation solutions – from rotary indexing tables and linear systems to handling solutions. The manufacturing site with a current production area of 22,000 m² is the corporate headquarters facility in Buchen in the Odenwald region. From integrative mastery in the competence areas of mechanical engineering,

electronics, and software, at this facility high-efficiency automation solution – combined with an unusual vertical integration come into place. In addition, the company has a powerful network of subsidiaries and sales agencies that guarantees a worldwide service presence. The most important user sectors are the special machine and tooling industry, the automotive and automotive supplier industry, medical technology, and the food, packaging and machine tool industries.

would make the selection.

The benefit for the user is the high machining capacity, the precision, and the process reliability: “For milling with interrupted cut in particular, our clamping technology offers a high degree of rigidity and vibration dampening, through the hybrid chuck used, a steel body with a mineral cast insert.”

Better workpiece quality

Mitsubishi Application Technician Ullrich Jüngert adds: “With this application two lucky breaks came together: We have a higher clamping

device rigidity and thus we were able to use an IMX-series end mill cutter, a milling system with interchangeable cutting head and carbide shaft that ensures high accuracy.” With this combination it was possible to also reduce the machining times by half in some cases – in addition there is the side effect of better workpiece quality. Schuster summarizes more than a year of operating experience: “A project such as this can only be executed with reliable partners. Partners who like ourselves also focus on integrating the employees. The only effort involved for the user Weiss was adapting and inte-

grating the clamping hydraulics in the controllers, in order to clamp and unclamp hydraulically. For Schuster, the overall result of this project is a success story in keeping with the slogan “small investment, big effect”:

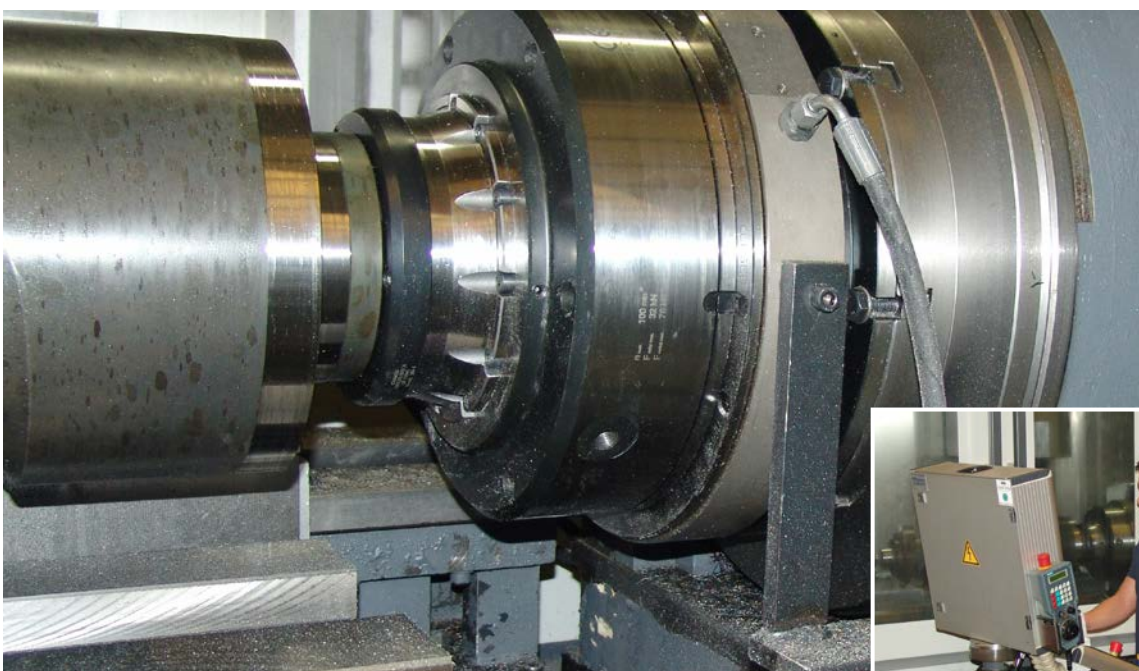
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Only the clamping hydraulics had to be integrated in the machine controller, for the adaptation.



Acting Department Manager Viktor Gruslak machining a large transport cam.