PERFECTLY POSITIONED

Turning and milling on a single machine

Complete machining is an important subject for the Head of Production, Markus Mucha, when it comes to increasing the productivity of CNC machining. In this regard, he was able to make considerable progress together with the workshop team around Roland Burghart. The pool of machines plays a significant role in the process. These are dominated by turning machines manufactured by TRAUB, with which SICK Stegmann has long been maintaining a partnership. Roland Burghart, having already worked there for more than 40 years, remembers cam-controlled machines from the frech.denk-based manufacturer from his apprenticeship period in the hall: “The quality of the machines was even impressive back then. However, our new TRAUB editing and fixed heaxbox leads deliver performance that brings true joy to a machinist.”

The ten turning machines at SICK Stegmann include five TRAUB swiss type lathes, from the TNL series, and three TRAUB TNX65/42 turn-mill centers. “We have continuously upgraded our fixed headstock-turning range with the three latter machines since 2011, and we have another order pending,” declares Markus Mucha. “With this machine type, we can machine up to a diameter of 65 mm from the bar and cover more than 90% of our tasks in the fixed headstock-turning range.” There are currently around 200 different articles machined on the TNX65/42. “Most of these are fully machined,” highlights the Head of Production. “The live tools perform the required milling operations perfectly so our parts come out of the machine completely finished. They go to the washing system, and then they go directory to assembly. In the end, we profit from the shorter idle periods and setup times, as well as the reduced machining costs. In the process, the quality from not having to change machines is even better than with subsequent machining on a turning and milling machine.”

Versatile turn-mill center

The TRAUB TNX65/42 is a turn-mill center designed to be modular, compact, and low-vibration with a generously sized work area. The 60° incline on the bed ensures good accessibility and chip removal. The machine can be equipped with two, three, or even four tool carriers, or even with a milling unit with two tool carriers. The CNC specialists at SICK Stegmann decided on the three-tool variant – but “fully equipped” as noted by Roland Burghart. “Every turn has an independent Y axis, and each of the respective ten stations can be equipped with live tools. A 2×2 bar loader supports automated material replacement.”

All three of the tool carriers can be used at both identical spindle speeds and encoders, a number of different shafts, ranges, and housings to be machined, as illustrated by Markus Mucha: “We have both small production runs of 10 to 50 pieces as well as large runs with 300,000 pieces per year. Around 80% are made of stainless steel and aluminum.”

As the end product, “rotary encoders,” indicate, most of the workpieces are round parts, which points to machining on turning machines. Roland Burghart, Head of Machining Manufacturing at SICK Stegmann, explains: “We rarely have purely milling parts. We use our milling machines almost exclusively for subsequent machining of turned parts. But even this use case is rarer and rarer with the complete machining on our TRAUB turn-mill centers.”

“IT6 tolerances are not a problem for my CNC team,” says the Head of Machining Manufacturing, who thinks the world of his employees. “We work in three-shift operation from Sunday evening to midday Saturday, and thus always have qualified individuals available at any time – day or night – to program, setup, and troubleshoot any of the machine groups. As a result, we do not experience long standstill times.”

The person in charge of CNC considers it a significant advantage that all of his TRAUM machines use the same control concept. This means that every machine operator is well versed in the details of programming every machine, and can bear out the fine details of optimization, which can ultimately be seen in the achieved increase in productivity.

Increased productivity

A solid example of this is the motor feedback system, HIPERFACE®, a SICK Stegmann product that sells at large volumes. Around 300,000 aluminum housings, which exist in four variants, are produced throughout the year in Donaueschingen. Four years ago, the production of half of the housings had to be contracted out to an external service provider. With the new turn-mill centers and the associated optimisations, the CNC department is able to manufacture all of the housings in-house – without having to significantly expand the machine capacity.

The utilization of CNC machining has increased in the process, because the team around Roland Burghart has since developed a reputation as turning specialists in the Group. This has led SICK Stegmann to also machine products for other units in the Group. These are mostly outside of the traditional spectrum of parts, made of stainless steel, titanium, or Hastelloy – and pose a significant challenge, as the Head of Production explains: “Even if some of these jobs make us sweat, we have been able to find a solution for all of them so far. That is definitely a source of pride for us.”

The turning specialists extract the maximum potential of their machines. For example, they now manufacture gears on the TNX65/42 and the Swiss type lathe using hobbing, which significantly reduces the cycle time. Before, the parts were sent out for gear cutting after the turning. Roland Burghart’s team does not only work on new pathways, but recently started using a milling head on the TNX65/42 to machine threading for a new SICK product. Markus Mucha affirms the success: “Our Group customers are so happy with the quality and costs that we are now the second supplier for this part alongside a renowned turn-parts manufacturer.”