

Moving up a gear thanks to combined expertise

A joint development project by SANDVIK Coromant and ZOLLER leads to increases in production efficiency and provides users with true added value

Promising growth potential has been forecast for large gears over the next years. This creates a demand for intelligent tool concepts. SANDVIK Coromant, world market leader for tool solutions in the metal-processing industry, and ZOLLER, innovation leader in the field of tool measuring technology, have combined their expertise in a joint development project. The result is a unique technological solution with a true value-add for the user.

In 2012, SANDVIK Coromant extended its portfolio by adding solutions for form milling cutters to provide better cutting rates and longer service lives, thus driving ahead the technological change to tools with indexable inserts. In order to progressively advance the innovations for hobbing machines, the metrology area also required further development. The 13,000 m² new produc-



SANDVIK Tooling Supply
Schmalkalden: state-of-the-art
manufacturing facility on 13,000 m²
of space.

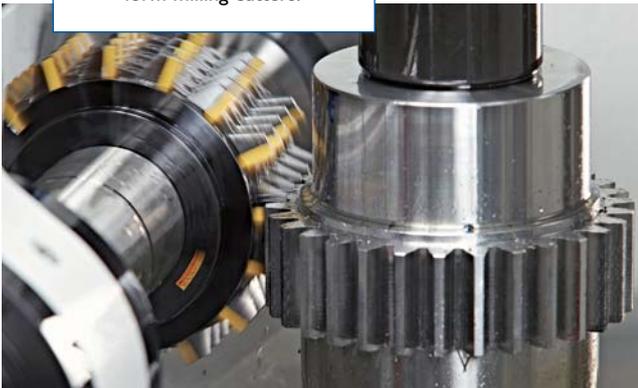
tion site in Schmalkalden, Germany, one of Europe's most state-of-the-art facilities, manufactures customized special tools for turning, milling and drilling - as well as a new product line of crankshafts and hobbing machines. Those hob cutters were the main reason for purchasing a measuring machine for the quality assurance/final inspection department.

The purchase of a new measuring machine turned into a joint development project

SANDVIK Coromant is well known for future-oriented innovations - and ZOLLER for finding measuring solutions

for virtually any type or size of tool. "Since off-the-shelf solutions just left too many gaps for us, the purchase of a new measuring machine turned into a joint development project", explains Axel Küpper, Senior Manager Global Sales&Application, Gear Milling Solutions. "It is our commitment to develop the best together with our partners. We - and ultimately our customers as well - have high demands".

Started in 2012, SANDVIK Coromant offers solutions for form milling cutters.



ZOLLER »hobCheck 800«
in Quality Control at SANDVIK
Tooling Supply Schmalkalden.





4 CNC-axes, software and image processing by ZOLLER ensure fully automated and contactless measuring processes.

SANDVIK COROMANT's requirements for ZOLLER were to accelerate measurement in quality assurance "to increase our productivity and to comprehensively document all parameters in accordance with DIN 3968 and thus give our customers security", states Axel Küpper. "If we are able to reduce measuring time by half, it makes a tremendous difference". Especially the "comprehensive documentation of hob cutters with indexable inserts in accordance with DIN 3968" required innovative development work by both companies.

The ZOLLER measuring machine, in operation since February 2012, is a special development based on the »hobCheck« with high resolution cameras for transmitted light and radial incident light measurement as well as 3D focusing. For the first time, this allows measuring and comprehensive documentation of hobbing machines in accordance with DIN 3968 employing image processing technology. The swiveling, CNC-driven optic carrier assures complete measurement of helical tools and allows

Axel Küpper, Senior Manager Global Sales&Application, Gear Milling Solutions, emphasizes the added value for users: comprehensive documentation of the measurements in accordance with DIN gives our users peace of mind.





Mario Peter, local project manager in Schmalkalden, praises the excellent, close cooperation of the two companies involved in the project.

recording of the actual contours. This new technology provides a distortion-free image of helical cutting edges in relation to the tooth profile. And since SANDVIK's focus is directed at large, complicated tools, crankshafts and gear hobbing machines of up to 250 kg, the measuring machine is equipped with a special heavy-weight spindle.

A special, sophisticated measuring program was developed

to allow the «documentation in accordance with DIN», making the measuring and evaluating of cylindrical hob cutters or form milling cutters with indexable inserts in accordance with DIN 3968 a standard procedure. In addition, it provides customers with a compiled, clear documentation. Among others, defined parameters include concentricity/run-out of the hub diameters, deviations in

shape, tooth thickness, and flute direction. By setting the specified quality classification, the tolerances for the individual parameters are automatically provided as well as an automatic allocation to the achieved quality category. Thomas Jäger, measuring technician at the Schmalkalden facility, emphasizes easy operation, short measuring times and comfortable repeat measurement. "This functionality allows measuring of the cutting edges at specific points and incorporating these into the protocol - thus saving enormously on time as measuring processes for the entire tool can often take several hours. Thanks to the repeat measurement function I can verify and update the protocol without having to start from scratch every time".

"Getting there was, of course, a special challenge for us. We were under great time pressure in terms of development and to some extent even treading in uncharted waters. This project required a good portion of imagination, inventiveness and ambition, but thanks to the good

and close cooperation with SANDVIK Coromant, we ended up with excellent results", says Christian Pfau, Head of Research & Development at ZOLLER. It took approximately six months to adapt the measuring program software fully to the customer's requirements. "The result certainly looks good. The close and highly complex collaboration has paid off and created a measuring software which is completely tuned to our specific requirements and increases our productivity".

The «excellent cooperation» is also confirmed

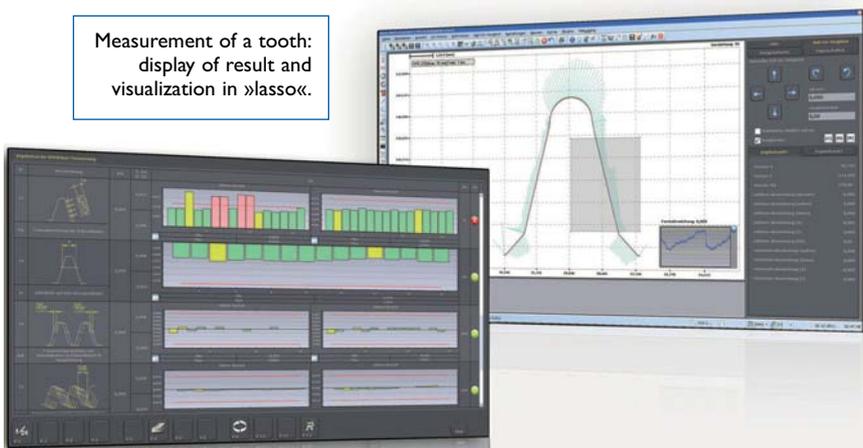
by Mario Peter, local project manager in Schmalkalden, who also praised the efficiency increase in their quality assurance: "Errors are easy to detect, and even a single tooth can be checked quickly and easily. This definitely provides an increase in our overall productivity".

The main competitive advantage for SANDVIK Coromant is a comprehensive documentation of the production quality in their new tool segment, which can be supplied with each delivery and thus guarantees added security for the user when employing the tools in expensive gear hobbing machines.

The initial purchase of a new measuring machine has turned into a joint development project, far exceeding a normal measuring program, where the know-how of both parties was put to maximum use. The result is a newly designed complex software, from graphic input, intelligent measuring processes to high quality visual documentation.

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Measurement of a tooth: display of result and visualization in »lasso«.



Clear and complete documentation of the measured results in accordance with DIN 3968.

