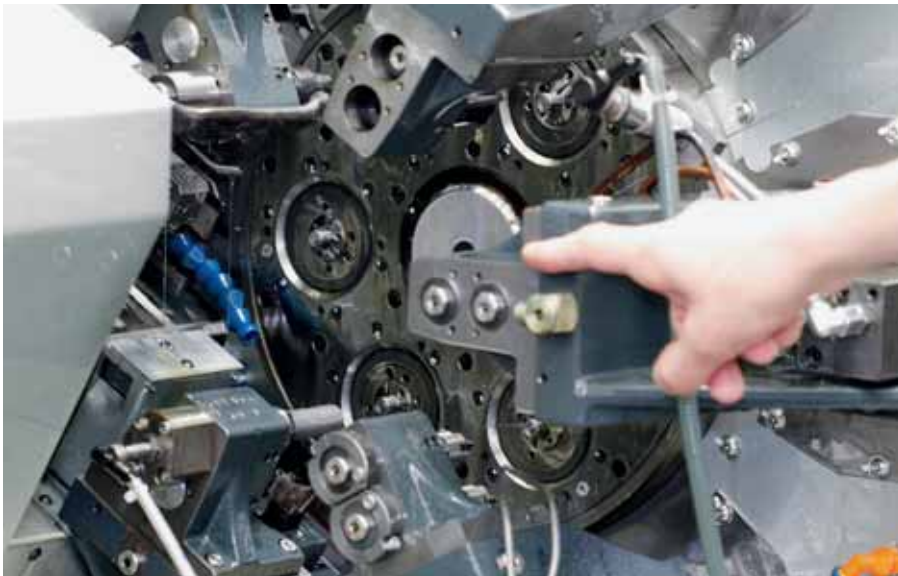




MULTISWISS: SIX OUT OF SIX

Michel Präzisionstechnik AG is a leading manufacturer that supplies some of the biggest automotive subcontractors, including Bosch and Continental. The parts it produces must meet rigorous specifications.

In order to ensure continued profitability and quality into the future, the company has invested in a Tornos MultiSwiss. Equipped with six spindles, this machine uses torque motor technology and offers high levels of thermal stability, productivity and flexibility.



Overview of the 6-spindle MultiSwiss from Tornos. Beautifully versatile: the Z axis guided by hydrostatic bearings, variable indexing and the spindle speed enable a wide variety of highly complex parts to be machined.

It is rare for a company to make such a positive impression as Michel Präzisionstechnik AG. In addition to its perfect technological organisation, its employees - from the machine operators to the director, and not forgetting the head of production - all conduct themselves with a warmth and politeness that can only be described as exemplary.

This welcoming atmosphere could well be the result of the recent investment in a Tornos MultiSwiss in January 2012, SMM's visit or other factors, however that is not the subject of this article. What is clear is that all of the MultiSwiss 6-spindle machine operators look decidedly happy. Only Tornos' competitors may seem downcast, but that's another story altogether.

The Tornos-developed MultiSwiss adopts a completely new technological approach. The head of the Multispindle turning team at Michel Präzisionstechnik

AG, Mentor Ramadani, explains this in clear terms during an interview with SMM: *"Tornos has managed to develop a multispindle machine which combines the advantage of a single-spindle - flexibility - with that of a multispindle - productivity"*.

All but child's play

The Grenchen-based company, which employs 160 staff, has thus far had no such machine. As a subcontractor for major automotive manufacturers including Bosch, Continental, Caterpillar and Delphi, the precision manufacturer has to meet the most exacting specifications. Among other factors, high precision, productivity and thermal stability, not to mention process safety, are vital.

The company manufactures precision parts for injection systems (diesel and petrol engines), braking



Pierre Vogt, Sadik Cubukcu, Mentor Ramadani and Mustafa Semiz all four look very satisfied; the thought of being able to go back to work on the MultiSwiss after the photo...? The machine in the background operates as the three teams rotate.

systems and gearboxes, and a tolerance of 1/100 mm is almost always a must. And there is no shortage of challenges, with this tolerance often needing to be reduced down to 2/1000 mm for series production. This is by no means child's play. However, thermal stability is not the only field in which the MultiSwiss has proven its worth. With regard to thermal stability, a sophisticated cooling system ensures that the temperature of the oil used by the cooling circuit is kept within a narrow tolerance. This means that, following a brief heating period, the machine can produce high-precision parts in non-air-conditioned premises.

When asked whether the machine can meet the precision specifications for manufacturing the parts, Mr. Ramadani is clear and to the point: "If it couldn't, we wouldn't have bought it".

Complete machining thanks to the counter spindle

Anyone familiar with the world of bar turning knows the vast range of requirements that turning machines must meet. Process safety and precision are basic requirements, but there are many more which are designed to exploit the machine's full potential. Mr. Ramadani continues: "At the moment, we use the MultiSwiss to produce parts for the automotive industry with a maximum bar diameter of 14 mm. We had previously been machining these parts using a multispindle machine. However, we couldn't produce each part fully on the machine as there was no counter spindle. This meant we had to finish machining the part on a second machine, a process which cost us time and money".

The counter spindle allows parts to be machined in their entirety. Using a MultiSwiss equipped with two tools, an operation and a secondary operation can be performed in a single pass. In most cases there is no need to use a second machine, which not only reduces the required space but also boosts productivity by up to 30%.

Spindles mounted on hydrostatic bearings

Tornos has developed an innovative, high-end technological solution: hydrostatics. Mr. Ramadani gives an enthusiastic presentation of the solution: "Thanks to hydrostatics, the machine has excellent damping characteristics which reduce vibrations during the machining process. This has positive results for the tolerance, surface quality and – a critical factor – process safety. The hydrostatic spindle bearings also reduce wear on the tools, resulting in lower costs. I would no longer want to do without hydrostatics. It's one of the key sales arguments for the machine".



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In the automotive industry, there is a general trend towards reducing batch size and increasing machine flexibility. In addition to independent spindle speeds, the possibility of indexing the different spindles offers significant advantages in terms of flexibility. The machining operations - turning, drilling, sanding and milling - can be performed in all 6 positions. "For certain parts, the variable spindle speeds are really useful", reveals Mentor Ramadani. "The MultiSwiss also has a spindle stop with an indexing function, making it possible to drill and mill both axially and radially in all the working positions to meet the part requirements. Eccentric drilling and special offset centring are no problem for the machine. The polygon turning device can be used to machine polygons. Generally speaking, this machine concept offers a level of production flexibility which nowadays is indispensable, without compromising on productivity". The 6 independently-controlled powered spindles and the linear-drive tool holder, which offers great acceleration, also help to increase productivity.

SPINDLES AND BARREL

A compact structure

Pierre Vogt, Turning manager, highlights another critical aspect of the MultiSwiss: "Although the MultiSwiss is a 6-spindle machine, it requires hardly any more space than a single-spindle machine. And it offers four times more productivity. The productivity per square metre is still a decisive factor when we are considering a new investment. If we had to produce parts on a single-spindle turning machine, we would need four machines to achieve the same productivity. That would give us four different batches, making it more difficult to guarantee quality than if we used a single machine to produce one batch. These are all aspects to be taken into account before investing".

The MultiSwiss is a compact masterpiece. All of the peripherals are built into the machine: electrical cabinet, loader, filtration device for spindle oil (5/1000 mm), filtration device for cutting oil (5/100 mm), water chiller, water/oil heat exchanger and coolant pump (up to 80 bar). And all in a unit measuring just 6 x 1.5 x 2.2 m (LxWxH) - quite a feat. And finally, the question of price/performance ratio. From our point of view, this does not tip the balance the other way - quite the contrary.

We only need consider the use of the shortest bars. The machine is designed for 1.5-metre bars. This length is unusual, however it offers extra advantages



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AMAZING TECHNOLOGICAL EXPERTISE

This is the first MultiSwiss you've purchased. What are your initial impressions?

Stéphane Rogazy: The MultiSwiss is an extremely interesting machine with regard to our product range. Its precision and process safety are remarkable. The fact that the machine incorporates some amazing technological expertise is certainly something to do with this. More and more factors play a role in machining, and sometimes these are factors that are not immediately apparent; for example, the oil viscosity is critical to the entire process.



For Stéphane Rogazy, CEO of Michel Präzisionstechnik AG, the MultiSwiss from Tornos represents an investment in the future.

Are you planning to invest in other machines?

SR: We plan a very quick return on investment on our first MultiSwiss. We are currently working on a new project with Tornos. If this is realised, we will be investing in other machines.

In the machine-tools sector, machines often need to be adapted as closely as possible to the processes. How well do you work with Tornos?

SR: We have a great relationship with Tornos. We are very close, both literally and on a professional level. If there are ever problems, we always get quick answers and we can count on Tornos' support in any situation. We work best together when we are facing sophisticated technological challenges, for example, an order for complex parts which are difficult to machine. When we encounter a problem during the machining process, we always know who to call. We work side by side to find solutions that allow us both to progress.

What is the current financial situation at your company?

SR: Michel is part of the Ferton group. Michel has an annual turnover of CHF 35 million, with yearly growth of around 10%. This growth is due to the reduction in secondary operations resulting from the acquisition of modern equipment and the rotation of 3 teams, 7 days a week. Our main problem at the moment is the strong Swiss franc, which is affecting us badly.

in terms of compactness and, above all, precision: shorter bars help to reduce vibrations and offer great results on profile material with 6 and 4 edges.

To conclude, a little story that demonstrates again the wonderful atmosphere at the company: once SMM had finished the interview in the production division, the employees returned to their machines with broad smiles!

Matthias Böhm
SMM editor



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