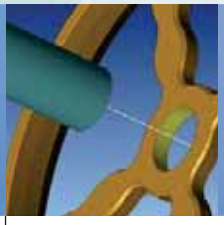
decomagazine

THINK PARTS **THINK TORNOS** 58 03/11 ENGLISH

A return to
form

Tornos brings
surface processing
into workshops

The µ is
standard



Save time
with Mastercam
Swiss Expert

UTILIS
multidec®
swiss type tools

WERKZEUGE FÜR DIE MIKROMECHANIK UND DIE MEDIZINALTECHNIK

OUTILLAGE POUR LA MICROMÉCANIQUE ET L'INDUSTRIE MÉDICALE

TOOLS FOR THE MICROMECHANICAL AND MEDICAL INDUSTRY

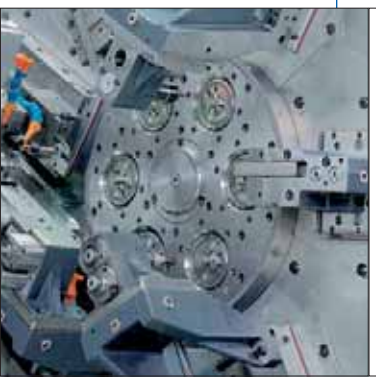
EMO Hannover
19-24·9·2011
Halle 5 | Stand A 20

UTILIS®
Tooling for High Technology

■ **Utilis AG, Precision Tools**
Kreuzlingerstrasse 22, CH-8555 Müllheim
Phone +41 52 762 62 62, Fax +41 52 762 62 00
info@utilis.com, www.utilis.com

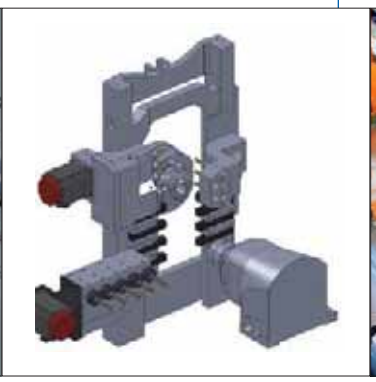
■ **Utilis France SARL, Outils de précision**
597, avenue du Mont Blanc, FR-74460 Marnaz
Téléphone +33 4 50 96 36 30, Téléfax +33 4 50 96 37 93
contact@utilis.com, www.utilis.com

10



A new, radically different concept

18



Delta 38/5: Power and rigidity

35

Always at the right temperature

45

Chlorine-free oils for fixed guide bushes

IMPRESSUM

Circulation: 14'000 copies

Available in: English / French / German / Italian / Swedish / Spanish

TORNOS S.A.
Rue Industrielle 111
CH-2740 Moutier
www.tornos.com
Phone ++41 (0)32 494 44 44
Fax ++41 (0)32 494 49 07

Editing Manager:
Willi Nef
nef.w@tornos.com

Publishing advisor:
Pierre-Yves Kohler
pykohler@eurotec-bi.com

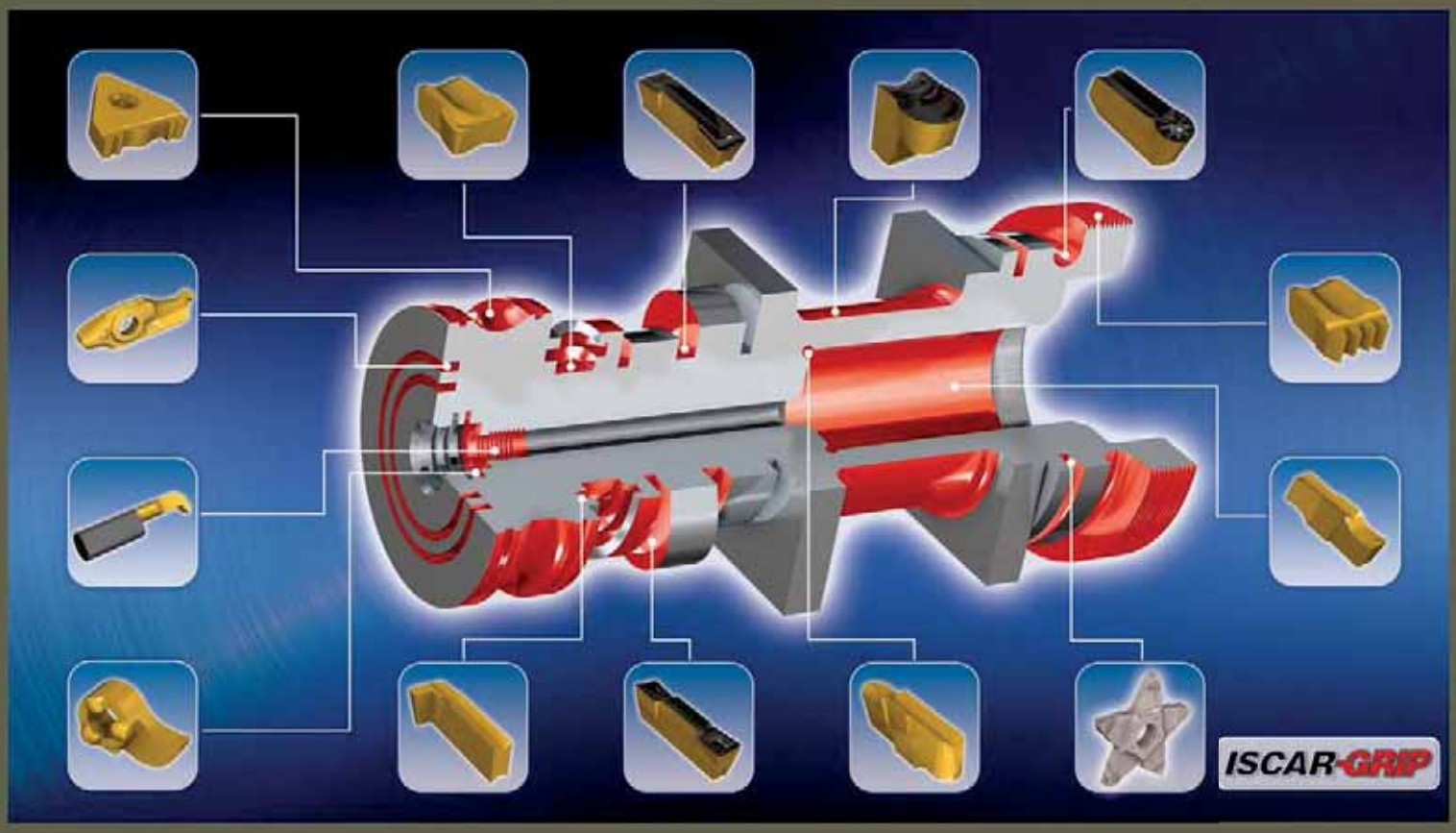
Graphic & Desktop Publishing:
Claude Mayerat
CH-2830 Courrendlin
Phone ++41 (0)79 689 28 45

Printer: AVD GOLDACH
CH-9403 Goldach
Phone ++41 (0)71 844 94 44

Contact:
redaction@decomag.ch
www.decomag.ch

SUMMARY

EMO 2011 - evidence of revival	5
A return to form	6
A new, radically different concept	10
Tornos brings surface processing into workshops	15
Delta 38/5: Power and rigidity	18
Sigma 32/6: Concentrated power	21
Cut, or mill?	24
A machine that makes working a pleasure	27
The µ is standard	31
Always at the right temperature	35
News from our satisfaction survey	38
Save time with Mastercam Swiss Expert	41
Chlorine-free oils for fixed guide bushes	45
3 innovative solutions to increase the number of tools on your automatic turning machine	49



Des combinaisons gagnantes en tournage-gorges pour une **réduction significative** des coûts de production

Pour plus d'informations, rendez-vous sur www.iscar.ch et cliquer sur la version interactive de cette annonce

Dispo 24/7

ISCAR TOOL ADVISOR
www.iscar.com/ita

Member IMC Group
ISCAR
www.iscar.ch

Fournisseur de Rentabilité
ISCAR, la garantie des résultats

ITA recommande l'outil optimal à partir des paramètres de l'application et de la puissance machine.

3 propositions minimum et jusqu'à 25 alternatives donnant conditions de coupe, puissance, temps de cycle, volume copeaux, informations techniques, etc

EMO 2011 - EVIDENCE OF REVIVAL

I could imagine that there will be a positive climate at EMO 2011 despite the financial turmoil which dominates the daily news routing in an insecure economic situation. Tornos certainly, will not be governed by the economic turmoil. Quite the contrary, by offering new and innovative products and application solutions we will give security to our customers to increase constantly their competitiveness. Tornos focuses on Innovation because we think it is necessary to innovate in order to survive. We are proud to present to you the result of our innovation efforts at EMO.

We are now able to offer our customers efficient products with clear technological advantages, short delivery times, and quality customer service; all these enabling us to effectively support the growth of our clients.

Tornos is presenting no fewer than 3 major new products at EMO 2011. Those of you who won't have the opportunity to attend this event can enjoy the overview in this issue of decomagazine.

MultiSwiss 6x14

Admire the MultiSwiss 6x14 which makes its debut at the event. This is a new product line, linking the single-spindle sliding headstock lathes and the multispindle. MultiSwiss is actually the first multispindle sliding headstock machine equipped with brand new technologies such as torque motor barrel indexing or even hydrostatic spindles. The MultiSwiss machine is compact in design and its peripherals are so well integrated that it takes up the same space in the workshop as a single-spindle turning machine.

Cyklos

Next we are presenting our Cyklos surface treatment technology. Cyklos does not require special facilities to operate: it is the first surface treatment machine capable of integration in a standard machine workshop. Totally independent; it allows our regular customers to add a fundamental link in their production line. Our products not only simplify the value chain of our customers, they improve the quality of processing parts with their rotating treatment. Cyklos is an unprecedented innovation in the world of machining. This is the fruit of our labour on our "Finished Parts" strategy. In becoming able to manage the entire value chain from the machining of the part to the production of finished product, we are becoming an increasingly strategic partner for our customers.

Delta 38

The Delta 38 is the more classic turning machine which can be viewed at our stand. The product of our partnership with Precision Tsugami, this machine constitutes the gateway into the world of large diameter machining. Powerful, rigid and offering a unique price/performance ratio, this turning machine will certainly find its market.

I am certain that these three new products will help our customers become more competitive. Customer satisfaction is at the heart of our business and we work tirelessly day after day to provide it. The customer satisfaction survey carried out this year confirms that we are on the right track. This survey showed that our customers are impressed by our excellent after-sales service. It also highlights the fact that our product line now means that we can meet all our customers' requirements in a highly specialised way.

I trust that you will enjoy discovering all these innovations for yourself.

Michael Hauser
CEO

A RETURN TO FORM

EMO Hanover is the 'must attend' event for all European machine tool manufacturers. The success of tomorrow's machine tools is born at this trade fair. Tornos has chosen this occasion to unveil three completely revolutionary products, namely the first entry level CNC multispindle turning machine, the first Tornos single-spindle machine with a 38 mm capacity and the first rotary surface treatment machine.

EMO Hannover 19-24·9·2011

During the 2009 economic crisis, the Tornos group implemented a short-time working policy in order to save jobs. The aim was to be prepared and to preserve the lifeblood of the company - its employees - the holders of its expertise. All departments were affected with the exception of one: the Research and Development group continued to work on strategic projects. Two of these projects involved developing the EvoDeco 10 and EvoDeco 16 machines; the chal-

lenge was overcome and the latest addition to the Deco range was launched at SIAMS 2011, an unprecedented success. You will also be able to admire these two technological marvels in action on the EMO stand. However, that's not all. The same group has also been working on other large-scale projects. Three of them will be unveiled at EMO.

Delta 38/5

The Moutier-based group's partnership with the Japanese Precision Tsugami group has enabled it to develop the Delta 38/5 machine - its passport to the world of large diameters. Produced by Tsugami, to Tornos' own specifications, this turning machine offers great rigidity and high power (see article, page 18). The engineers in Moutier were involved in developing the Delta 38/5 turning machine. The partnership brought together two different visions to produce the optimal machine; in addition, like similar partnerships in the automotive industries, the Delta 38/5 retains the Tornos-specific features, particularly in terms of the software, with a complete range of G900-type programming help macros. Tornos now offers one of the most extensive product ranges on the market in terms of sliding headstock automatic turning machines.

A technological marvel: MultiSwiss 6x14

The MultiSwiss is a numerically-controlled multispindle turning machine featuring new technologies and containing all the peripherals required for optimal operation at a lower price than any other CNC multispindle lathe. This is the achievement of the MultiSwiss 6x14. It takes its name from the maximum bar passage diameter (14 mm) multiplied by the number of spindles. The user-friendly MultiSwiss has been designed to offer maximum user comfort. We can confidently affirm that it is the most comfortable multispindle turning machine currently available: The MultiSwiss is the first frontal machine available on the market. It is also the first machine not to use Hirth gear coupling to lock the barrel. This classic system, well-known to Tornos has been successfully replaced with a torque motor. The spindles are equipped with a hydrostatic sheath (to guarantee excellent damping). In addition, the MultiSwiss 6x14 is the first multispindle turning machine on the market to be equipped with mobile spindles. That makes it the first sliding headstock multispindle turning machine to offer an all-in-one peripheral concept (see article, page 10 and multiswiss.info). The MultiSwiss is the new jewel of the Tornos range; it will produce parts using multi-programs to demonstrate how easy the MultiSwiss is to use, and offers productivity equivalent to that of a cam-controlled multispindle turning machine.

Almac CU 1007

The Almac CU 1007 machining centre will be presented with its softening cell; this enables parts to be fully machined. This means that the front and rear faces are machined on a single machine. The robot at the centre of the assembly enables the part to be loaded and transferred between machines and also manages the palletisation and softening of the part. The machining centre will be used to produce a brand new medical part at the show.

Cyklos

The Cyklos is the first of a new kind of surface treatment machine and can be installed in a standard mechanical workshop. Unlike a traditional process that works using vertical immersion, the Cyklos works by rotating, thus guaranteeing superior quality. The Cyklos technology will be presented alongside a MultiSigma 8x28 Chucker and demonstrates that Tornos is still a supplier of genuine solutions. This new concept enables customers to make considerable progress in terms of organising the treatment of their parts in large batches (see page 15, Cyklos article). The Cyklos and MultiSigma represent Tornos' complete lean manufacturing solution.

The marriage of 4 fields of activity and an impressive range

Tornos is active in 4 large market sectors: automotive, connections, medical and micromechanical. It is this expertise that you'll be able to admire at EMO. The EvoDeco 10 machine will demonstrate Tornos' expertise in the field of connections through an operation that makes full use of the turning machine's capability. The Delta 20/5 III machine equipped with motorised secondary operations will show visitors the important functionalities offered by this entry level machine.

The EvoDeco 16 will produce a complete dental implant: 3 different parts from a single bar, as on the MultiSwiss turning machine. The parts are sorted at the machine's outlet. Tornos has been active in the medical sector for over 20 years, enabling it to acquire unrivalled experience in this market; the company will also use its expertise not only on the EvoDeco 16, but also on the Gamma 20 turning machine, which has a unique 50 mm thread obtained by thread whirling. The Almac CU 1007 machining centre will complement the offering in the medical sector, which is traditionally limited to turning. Thanks to this range of products, Tornos has consolidated its position as a supplier of machining solutions.

The automotive segment is the biggest market in Germany; it is also a field of activity which is vital to Tornos. No fewer than three machines will be demonstrating their capabilities in this highly demanding sector. Of course, you'll be able to admire the Delta 38 and the Sigma 32/6, two of our world premieres. The latter will be on show with different types of part to demonstrate its power and exceptional swarf removal capability. As a counterpoint to these two single-spindle turning machines, a MultiSigma 8x28 multispindle machine will also be exhibited. Recently launched, this product has already aroused considerable interest among customers operating in the automotive sector.

EMO 2011 will reveal Tornos in a whole new light with its range of new products. The Tornos experts invite you to come and visit stand B04 in Hall 17. Enjoy your visit!

Brice Renggli
Marketing and
Communications Manager

HAROLD HABEGGER

Canons de guidage
Führungsbüchsen
Guide bushes

Type / Typ CNC

- Canon non tournant, à galets en métal dur
- Evite le grippage axial
- *Nicht drehende Führungsbüchse, mit Hartmetallrollen*
- *Vermeidet das axiale Festsitzen*
- Non revolving bush, with carbide rollers
- Avoids any axial seizing-up

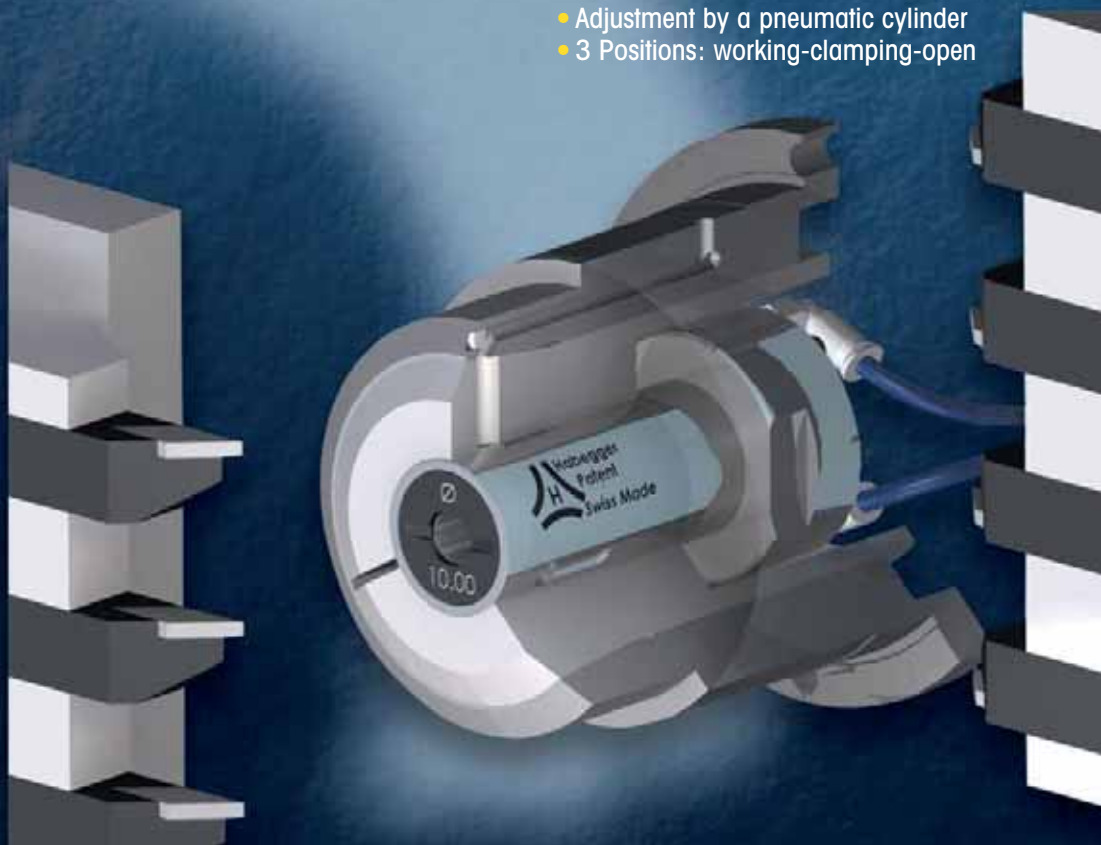
Type / Typ C

- Réglable par l'avant, version courte
- Longueur de chute réduite
- *Von vorne eingestellt, kurze Version*
- *Verkürzte Reststücke*
- Adjusted from the front side, short version
- Reduced end piece

Type / Typ TP

- Réglage par un vérin pneumatique
- 3 positions: travail-serrage-ouverte
- *Einstellung durch einen pneumatischen Zylinder*
- *3 Positionen: Arbeitsposition-Spannposition-offene Position*
- Adjustment by a pneumatic cylinder
- 3 Positions: working-clamping-open

1 Porte-canon: 3 types de canon Habegger!
1 Büchsenhalter: 3 Habegger Büchsentypen!
1 Bushholder: 3 Habegger guide bush types!



Harold Habegger SA
Route de Chaluet 5/9
CH - 2738 Court
www.habegger-sa.com

A NEW, RADICALLY DIFFERENT CONCEPT

With the launch of the MultiSwiss 6x14, Tornos presents the first numerical sliding headstock multi-spindle machine on the market. Based on the "fully integrated" concept and featuring innovative front access, this new machine is designed with three types of customer in mind: Users of numerical multi-spindle turning machines and cam-operated machines, and single-spindle turning machines. MultiSwiss is a revolution: a new product line which provides a link between multispindle and single-spindle turning machines. To find out more, we met with Rocco Martoccia, the Tornos Product Manager.

At the beginning of 2008, the multi-spindle product department at Tornos put in place an ambitious project with clear objectives: To create a multi-spindle turning machine with 14 mm capacity at an attractive price offering unrivalled efficiency and a rapid return on investment. The machine must also be flexible, accurate and easy to use. The new technologies chosen must not compromise the renowned benchmark reliability of Tornos' cam-operated multi-spindle turning machines. Other market requirements included a reduced footprint, increased product efficiency (including, if possible, the integration of different peripherals from the point at which the product was designed by the manufacturer to increase its overall efficiency). And, of course, the machine had to be very easy to use with a user-friendly design. Three and a half years later, customers can discover the MultiSwiss 6x14 for themselves at EMO Hannover. Have the points of this basic concept been met?

Specifications met!

"Four machines have been trialled by our customers over several months now and the results demonstrate that the MultiSwiss 6x14 keeps all its

CUSTOMISED LOOK

A great deal of thought has gone into the design in terms of its ergonomics and the MultiSwiss offers a particularly harmonious look. For the first time, Tornos is also offering its customers the chance to customise part of the machine's cover. Using high-quality digital printing directly on the sheet metal and a furnace heat treatment, interested customers can also personalise the machine as they wish. The machine on show at EMO will also be decorated with particularly Swiss-themed motifs.

promises and matches up well to the specifications that we were given," Mr Martoccia states proudly. He explains: *"We used the basic model as a springboard from which to create a new machine featuring innovative technologies while holding on to our objective and focussing on the prize to be won at the end, which was the product. First and foremost, we designed new components which were individually tested for over a year. Next, we assembled a prototype to validate the solution as a whole. For example, our revolutionary new barrel which is a world first on a multi-spindle turning machine"*. Featuring new, faster and quieter torque motor technology, this barrel was tested over 40 million cycles before being awarded its validation certificate.

Fundamental changes

In a global approach to finding a "fully integrated" solution, the company had to make choices, some of which involved a change of approach on the part of our customers.

First change: loading the machine with 1.5 m bars. On this subject Mr. Martoccia clarifies: *"There were several advantages in this choice: it reduces the machine's footprint by 35%, it makes it easier to handle the bars, and we can reduce the level of noise and vibrations produced by the machine… however, we had to overcome certain obstacles. In particular, the loss of efficiency owing to the number of feeding operations required (twice as many as for bars that are twice as short). We were able to resolve this issue very effectively as we can now feed a bar four times faster than the integrated bar feeders currently available. Another point to tackle was the loss of material at the end of the bar as there is twice as much scrap generated. We found a very interesting solution to this issue too since the scraps generated are three times shorter than those of current solutions.*

That only left us with the long-standing custom amongst our customers and suppliers of supplying 3 m bars.

We contacted several of them and on reflection most agreed that it would be possible to supply 1.5 m bars".

Tornos also investigated the possibility of cutting the standard bars in half. The second important change was the machine's ergonomics. With completely open access at the front, Tornos had clearly pushed accessibility further than any other solution on the market by offering a design that enabled the operator to "get right inside the machine". The tool holders with integrated spray via the slides and the option to change the grippers from the front of the machine enable users to change the set-up as quickly as on a single-spindle machine, which opens up new possibilities. As all the slides are "vertical", the swarf naturally falls directly onto the evacuator, which increases the efficiency of the machine and reduces the number of unwanted swarf removal operations for the operator.

All inclusive

Another strength of the machine is the seamless integration of all the necessary peripherals. As standard, the MultiSwiss includes the feeder, the management system for swarf and oil with dual filtration incorporating a paper filter system (filtration to 50 µ) in addition to an ultra fine filter (5 µ). The list of options has been reduced: oil mist extractor, chip conveyor, fire prevention system and high pressure pump. These have been designed to integrate seamlessly into the machine. The fact that this integration has been incorporated into the machine from its very design means that its footprint is reduced and the MultiSwiss can quickly find its place in the heart of any workshop. The machine takes up no more space than a single-spindle machine of equivalent capacity.

Precision and heat regulation

Mr. Martoccia continues: *"The machine's precision is closely linked to its temperature response characteristics"*. The machine's temperature is fully controlled via the cutting oil which is monitored by a plate heat exchanger. The machine core is kept at a constant temperature, even when stopped. This ensures normal operation during production. To improve efficiency, the regulation system can be pre-programmed in order to reduce the machine's standard heating times. As standard, the MultiSwiss features a plate heat exchanger designed to be connected to the company's centralised network. This type of system means that cooling systems do not need to be fitted to each machine, which fits perfectly into many companies' energy saving policies. Mr. Martoccia clarifies: *"In terms of cooling, the trend looking forwards is to have a centralised cold water circuit (already a part of many companies on the forefront of technological developments). The MultiSwiss is designed to be connected directly into the central network whatever its temperature, without compromising its precision, as extremely accurate regulation is guaranteed in all cases. Nevertheless, as many companies do not yet have this technology, the machine has been designed so that a cooler can be integrated to enable the machine to work autonomously. This option also enables interested companies to fit an external cooler in confined spaces with the peace of mind that Tornos will manage the temperature regulation"*.

Silent operation

The technological choices made by Tornos have also had a positive effect on the noise level and the working conditions of the MultiSwiss. *"We have often found that when the machine is connected to the water supply there is no noise from the refrigeration, it is only when we look at the screen that we realise that the machine is actually running at 8,000 rpm. Using smaller bars reduces the noise level and the new barrel locking system is also very quiet. This aspect is also very important for user comfort,"* explains Mr. Martoccia.

Integrated PC and ergonomics

As on other Tornos numerical multi-spindle turning machines, the MultiSwiss includes an integrated PC. This system offers a very user-friendly interface with a large colour touch screen. Programming is carried out on TB-Deco. The integrated PC offers a great deal of flexibility. If some small program changes are required, these can be made directly on the machine. The PC offers other services as well, for example, all the machine documentation is instantly available. The servicing instructions, user and maintenance manuals are also loaded onto the PC. In the event of an alarm, for example, the user can immediately display the file on-screen and read all the comments relating to this problem. Everything is at your fingertips and it is easy to navigate. In case of problems, remote maintenance means that the machine can be controlled remotely by a specialist, which in some cases will mean that it won't be necessary to call out a service engineer or to perform more precise diagnostics to optimise the work in every case.

Finally… what can the machine do?

With a 14 mm capacity, the machine can hold up to 15 tools in operation and 3 in counter operation. Each shaft and each spindle can be independently programmed, which enables standard tools to be used at the ideal cutting speed for each. The controlled position of each spindle enables drilling and milling operations with precise angular location even between stations. The bar feed is performed via Z axes integrated on each powered spindle (sliding headstock). *"All machining configurations are possible: our machines can obviously turn, but for those who are very keen to use the machine for indenting, the use of hydrostatic technology provides much-needed damping and also enables this type of operation to be carried out,"* states Mr. Martoccia. Different devices complete the machining capacities, for example, the polygon operation device or the high pressure drilling/milling systems for operation and counter operation. To date, the parts produced span many different fields: watchmaking (winding crowns), electronics (hard disk shafts and nuts), automotive (ABS, airbags), aerospace (tubes and small drive systems) or even the chemical industry (joints).

And what are the results?

In terms of productivity and ease of use, operators are unanimous in their praise of the machine's excellent performance, but what about precision? Many production tests have been carried out and the results are very good. In production, the machine produces dimensional variations in the order of 4 to 5 Microns. To shorten the heating times as much as possible, the MultiSwiss features an oil circulation pump start-up option. This means that all the components can be harmonised even before starting work. *"With this system, we can be operating in the centre of the tolerance range in under 30 minutes"* explains Mr. Martoccia.

New approach, new advantages

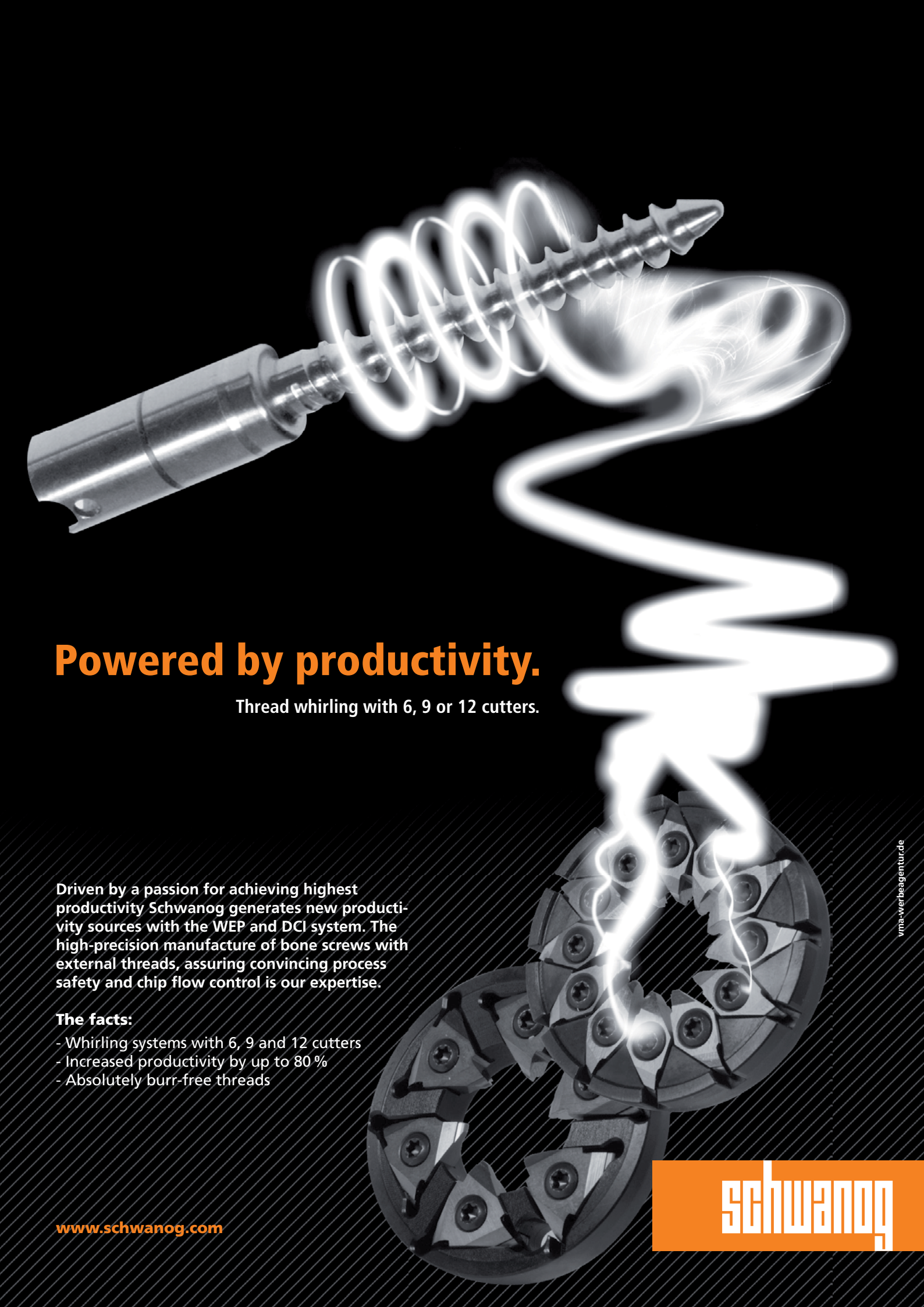
With the MultiSwiss, Tornos is proposing a new approach to working on multi-spindle turning machines and the first customers to use this new machine have been very positive. Mr. Martoccia compares the arrival of this machine with the launch of the first Deco machines in 1996: it's innovative, efficient, attractive, ergonomic and at a very affordable price.

Will we see the MultiSwiss enjoy the same level of success as the Deco? It's a little early to say, but the initial feedback has been full of praise. Four machines have been trialled by our customers over several months now. *"This is the first time we have presented a new machine at a show which has already been intensively used by customers over a long period"* concludes Mr. Martoccia.

An article on this topic written by Joseph Martin, Bar turning (France) can be found on page 27.

The machine will be shown at EMO and the first deliveries are scheduled for October this year.

Further information:
Rocco Martoccia
Tornos SA
Tel. +41 32 494 44 44
Email: martoccia.r@tornos.com



Powered by productivity.

Thread whirling with 6, 9 or 12 cutters.

Driven by a passion for achieving highest productivity Schwanog generates new productivity sources with the WEP and DCI system. The high-precision manufacture of bone screws with external threads, assuring convincing process safety and chip flow control is our expertise.

The facts:

- Whirling systems with 6, 9 and 12 cutters
- Increased productivity by up to 80 %
- Absolutely burr-free threads

www.schwanog.com

schwanog

TORNOS BRINGS SURFACE PROCESSING INTO WORKSHOPS

The machine-tool builder is well known for being a solution provider for its customers and at this year's EMO this reputation will, once again, be reinforced. Often the global efficiency of manufacturing is drawn downward by interrupted flows in the whole process. With Cyklos, a turn-key surface processing unit, Tornos reduces drastically these non productive (and then costly) times. Cyklos offers surface processing in a continuous manufacturing flow.

A clear need

Surface processing has traditionally been physically kept separated from machining. The size of the installations and buildings, the safety requirements and the environmental hazards of the chemical processes refrained workshops, with a few exceptions, to invest in and operate surface processing equipments nearby in-line with machining. However prior deliveries, most of the finished parts go through a surface processing step (anodizing, phosphating, electroplating…). As a consequence, an interruption in the manufacturing flow of finished parts remains until today, increasing lead time, logistic costs and defects. Tornos tackles these three points simultaneously and enables a continuous manufacturing flow with the Cyklos solution, a unique technology combining a surface processing equipment and process in a compact, zero reject[1], high performance and low cost of ownership tool.

Technology

Cyklos concept is based on a patented technology owned by Tornos in which parts are transported from bath to bath and inside each bath automatically via a simple combination of translation and multiple rotations along the same axis of small carriers on which the parts are attached to.

[1] *All hazardous liquid and vapors are trapped and filtered inside the Cyklos equipment so that it requires no on-site wastewater treatment installation and no specific construction.*

MAIN FUNCTIONS OF CYKLOS

- Anodisation of Aluminum and Titanium
- Chemical or electroplating of metals on Steel
- Steel phosphating
- Chemical or electrochemical deburring on Steel, Aluminum, Titanium,…

As typically hundred parts can be loaded on each carrier and a carrier can enter the machine every two minutes, the machine throughput can continuously process parts at a rate of one part per second. As each carrier undergoes the exact same processing sequence that the next or the previous carrier and since the process is (chemicals, temperature, voltage,…) entirely computer controlled, the stability of the processing performances is ensured. As the carrier perform several complete rotations in the processing baths, there is no gas remaining in the parts and the non uniformities of the current lines of the electro-chemical process are fully averaged. Hence, this technology achieves an unprecedented combination of productivity, stability, quality and uniformity.

Moreover, the carriers remaining always either inside the baths or just above the liquid surface, a very efficient and cost effective trapping of vapors from the bath is enabled. In addition, the cross-contamination from bath to bath is drastically reduced by the rotation of the carriers and the large surface ratio of parts over carrier.

It is therefore possible to filter and trap all hazardous vapors and waste inside the machine so that it can be operated with zero reject on site. Indeed, the machine can be installed in a machine shop with only electricity, compressed air and water inlet and without any connection to the drain.

Integrating all key process steps like surface preparation (degreasing, activation,…) surface processing (anodisation, plating, phosphating, deburring…) rinsing and drying then becomes possible in a highly efficient and compact tool: as each Cyklos tool is dedicated to one surface processing, each step can be streamlined and highly integrated.

With carriers to transport the parts throughout all steps, the Cyklos tool has the flexibility to process different parts sequentially either with identical carriers or carriers with adapted part fixtures depending on part design.

As a conclusion, the Cyklos technology embedded in a compact and dedicated housing has all it needs to perform with superior performances in the workshops most of the surface processing traditionally made in very large and remote installations.

Performances comparison and customer benefits

A traditional surface processing installation is composed of a series of chemical or electro-chemical processing baths separated by a series of rinsing baths to prevent cross-contamination between different processing baths. The parts are carried from baths to baths either attached on or confined in large carriers. The carriers are hanging on a top rail and their movement, either vertical towards the bath, or horizontal from baths to baths may be automatically controlled. The common characteristics of these installations are:

- Large volume baths (several thousands of liters)
- Large footprint (20 meters long, 5 m wide, wastewater treatment excluded)
- Incomplete hazardous vapor confinement, thus requiring specific buildings (corrosion protected)
- Large flow of wastewater to be treated on site with specific installations
- Significant processing variations within a carrier (ex: 30 +/- 7 microns for anodisation)
- Manpower for loading and unloading carriers triggering costs and defects
- Chemical skills to tune and control processes and baths.

All these characteristics have led workshops to outsource the surface processing of their parts to dedicated plants where the required chemical processes are operated.

The Cyklos technology exhibits radically modified characteristics to enable workshops in line operations:

- Small volume baths (several hundreds of liters)
- Small footprint (6 meters long, 3 m wide, including wastewater treatment)
- Complete confinement of hazardous vapor enabling operation in machine shop buildings
- No wastewater to be treated on site, no connection to the drain
- Low processing variations within a carrier and carrier to carrier (ex: 30 +/- 2 microns for anodisation)

- No manpower required for loading and unloading carriers, reducing defects
- Automatically and in-situ regulated chemical processes.

As an example, a Cyklos solution for anodizing piston brakes can process more than 5Mp within a year at a total cost of ownership of less than 0.05 € per part.

Thanks to these multiple and unique advantages, the customer equipped with a Cyklos solution combined with machining will be capable to produce large quantity of parts (10 Mp per year) with a completely automatic, environment friendly and lean manufacturing line, reducing at the same time costs, delays and defects.

Interested customers will be able to discuss this new way to streamline production with Emmanuel Turlot, the new Surface Processing Business Manager with Tornos at EMO on Hall 17, booth B04.

CYKLOS TO STREAMLINE PRODUCTION

To know more about this strategic move by Tornos, decomagazine met with Emmanuel Turlot, responsible of this activity.

decomagazine: Mr. Turlot, it is a completely new activity for Tornos, how did you decide to enter that market?

Emmanuel Turlot: Tornos has been continuously scanning emerging technologies and evaluating the potential impact on the manufacturing of finished parts. The Cyklos technology was one of them and has been followed for several years. When critical show stoppers like zero reject on site and process stability have been removed and a compelling business case has been verified, we decided to invest into its industrialization. The swiss expertise in chemical processes and equipment was also a key success factor.

dm: Is it easy for a customer to acquire this technology? Will he be difficult for him to «learn a new job»?

ET: We have from early on acknowledged that putting a chemical tool in a workshop is the main entry barrier for Cyklos technology. We have therefore captured knowledge from different process intensive industries like semiconductors or display to integrate similar solutions (like Automatic Process Control) that enabled fast adoption of a wide spectrum of technologies into mass production lines. That being said, the adoption of Cyklos technology is now to be demonstrated and this is our primary short term goal.

dm: I've heard you already presented Cyklos to a few customers, how did they react?

ET: I have been very positively surprised by how quickly and with no exception these customers decided to evaluate our new technology. I have in the past experienced more resistance from production engineers who are under strong time pressure and, for good reasons, traditionally risk adverse.

dm: I imagine that such a machine represents a large investment. From how many parts a year do you think it is valuable? (to precise more or less who the targets are)

ET: The first generation of Cyklos tool is dedicated to large volume manufacturing (from 5 to 10 Mp per year) and the target markets are automotive and aeronautics. We make sure with our customers their return on investment is shorter than two years.

DELTA 38/5: POWER AND RIGIDITY

The Delta 38/5 turning machine will be unveiled for its world premiere at the EMO trade fair in Hanover. For a long time, bar turning has been limited to bars with a diameter of 32 mm. Very few automatic turning machine manufacturers are prepared to venture beyond this diameter for a sliding headstock machine. This is the challenge that the in-house engineers at Tornos and Precision Tsugami took on together to bring this turning machine to life.

The Delta 38/5 turning machine is designed as both an entry point to the Tornos world, but also as a pathway to larger diameters. The turning machine is capable of machining workpieces up to 35 mm in diameter. The maximum diameter can reach 38 mm if bar preparation is used. Fitted with 5 linear axes, two C axes and two independent tool systems, the Delta 38/5 can take up to 31 tools.

Increased power and torque

The turning machine surpasses its main direct competitors in terms of diameter, of course, but also in terms of power. With a mass of 4.6 tonnes, a main spindle developing 11 kW at peak, and torque of 70 Nm, combined with turning tools with a section of 20x20, the machine offers high performance in terms of removing large amounts of swarf. *"With these capacities, the scrap length is a challenge; materials are costly, so it is very important to minimise them"*, explained Serge Villard, product manager at Tornos. The ingenious guide bush spindle concept allows the scrap length to be massively reduced as compared to a conventional sliding headstock machine. This system allows the rigidity of the guide bush to be improved and allows aqueous liquid to be used.

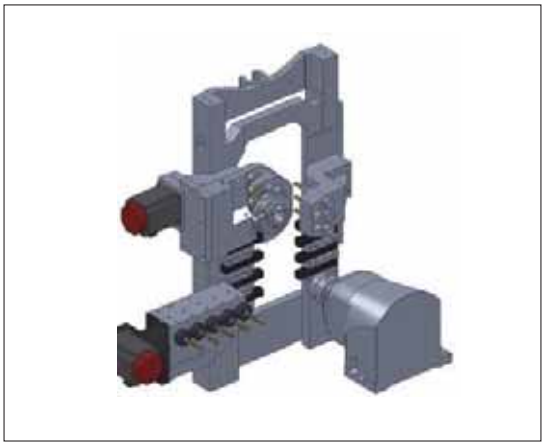
Two versions to meet all needs

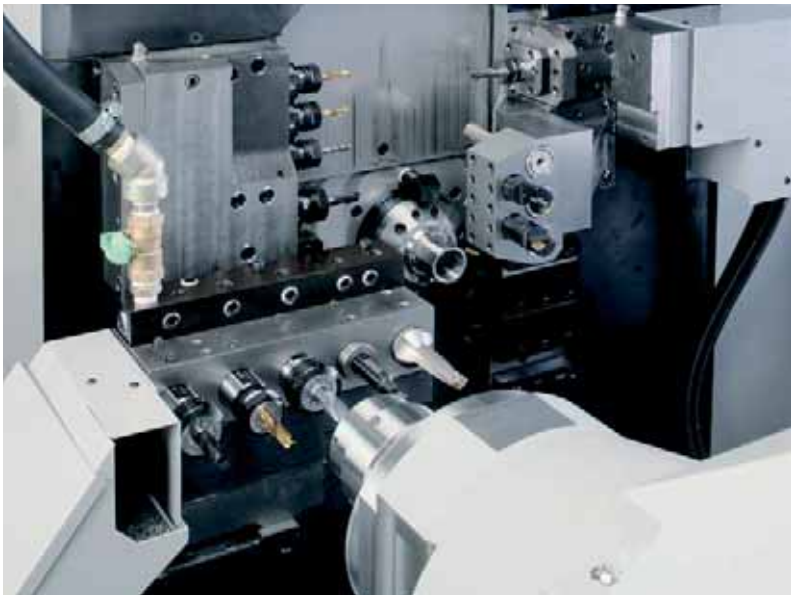
The Delta 38/5 is available in two versions, A and B, which differ in terms of motorised tools. In both versions, the Delta 38/5 has a main radial 4-position tool

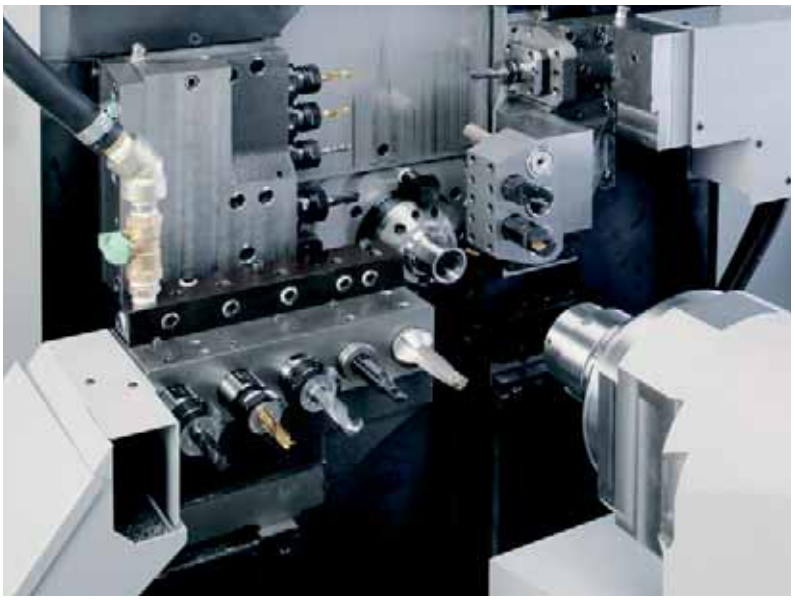
unit (3 x ER16, 1 x ER20), 8 turning tool positions, plus a 5-position horn (3 x Ø 32 mm, 2 x Ø 20 mm) for axial machining in main and secondary operation. Obviously, the machines have a counter spindle which can be used to work in concurrent operation time on a secondary operation station, which can take up to 5 fixed tools.

The Delta 38/5 A version can be equipped with a maximum of 31 tools, including a maximum of 8 rotating tools. The second motor is located on the rear platten, thereby making it possible to assign a maximum of 4 rotating tools through a dual drilling/milling device; the latter allows operations and secondary operations to be carried out simultaneously.

The B version has a second motor in secondary operation; this version can take up to 27 tools, including a maximum of 9 rotating tools on the secondary-operation unit.







Comprehensive equipment at an attractive price

The Delta 38/5 turning machine is equipped as standard with very comprehensive equipment including, for example, a 20 bar pump with 4 controllable outputs (front platten, rear platten, secondary operation, counter spindle washing). The FANUC 0i-TD numeric control includes a large number of functions, and further enhances its user comfort. The basic equipment includes a conveyor belt, and a pneumatic ejector integrated into the counter spindle.

Ergonomics and accessibility

Despite being entry level, the turning machine has been designed with operator comfort in mind. According to Mr Villard, now all Tornos developments focus on the user comfort of the product. It is his opinion that operators are our best ambassadors.

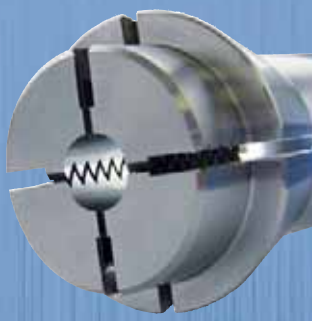
So, the machining area is huge, and the tools easily accessible. The swarf tray can be emptied whilst machining. Automatic cyclical lubrication and an oil tray on castors allow easy maintenance of the turning machine. The pivoting arm gives the operator improved access to the turning's machine's control panel.

Serge Villard will be on hand to speak to decomag readers at EMO in Hanover at the Tornos stand, Hall 17 stand B04.

Cube

Extenso

Croco



THE KEY TO YOUR SUCCESS!

Full equipment for automatic lathes (CNC- or cam-controlled)

Technical assistance

High quality and competitive prices guaranteed

Express service

WIBEMO SA
WILLY BENDIT
OUTILLAGE DE PRÉCISION

www.wibemo.ch

Wibemo SA | CH-2832 Rebeuvelier | téléphone ++41 (0)32 436 10 50 | fax ++41 (0)32 436 10 55 | info@wibemo.ch

SIGMA 32/6: CONCENTRATED POWER

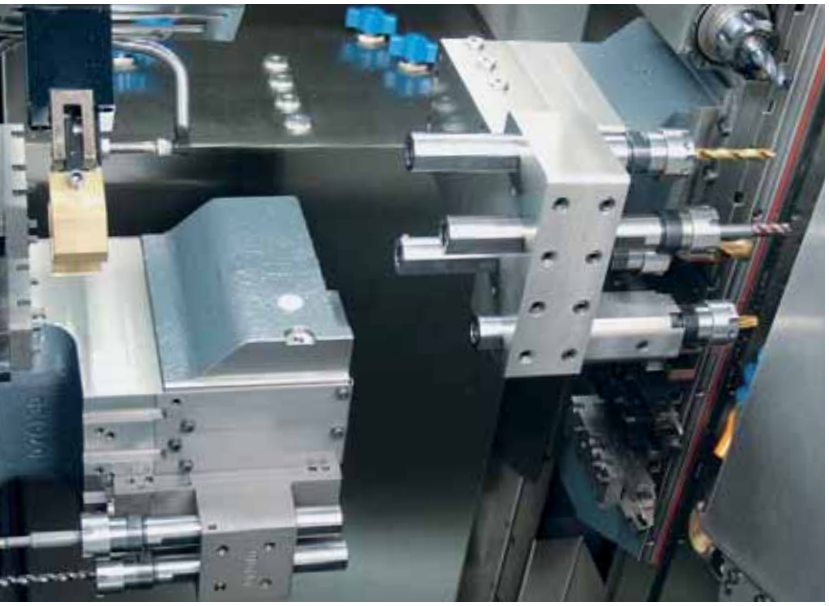
The machines in the Sigma range are well-known for their power and rigidity; they are the only sliding headstock machines on the market able to work with the machining parameters of a fixed headstock machine. To increase their target market, the two Sigma models have benefited from a range of new features which allows them to be even more finely adapted to the requirements of the market.

EMO Hannover 19-24·9·2011

"The first thing to strike customers who have just purchased a Sigma turning machine is the quality of the workpiece created by the machine, even at high feedrates; identical rigidity of the machine in main and secondary operations means that impeccable surface finishes are created", explains Arnaud Lienhart Sigma Product Engineer at Tornos.

As the power of the 32 mm (6.0/7.5 kW) model's spindles is identical in both main and secondary operation, swarf removal is beyond compare. According to Arnaud Lienhart, with a well-adapted peripheral, it is virtually impossible to stall a spindle or counter spindle on a Sigma 32/6 turning machine. Thanks to the mirrored kinematics, identical spindle power and comparable rigidity on the two stations, it is no longer necessary to favour operations on the bar.

After two weeks of using a Sigma 32/6 turning machine, one customer, who has a full bank of recent competitors' machines with a 32 mm diameter turret, was able to reduce their cycle time by almost 60%. It is the power of the spindle in secondary operations which has enabled this amazing saving, allowing axial drilling of 16 mm along a length of 45 mm, while the spindle of the competitor's



turning machine restricts the latter to drilling diameters of 7 mm and shuttling operations for a diameter of 10 mm. While such large savings are exceptional, we can however confirm that the power of the Sigma 32 enables savings in the region of 30% as compared to its direct competitors.

Delta 38/5 vs Sigma 32/6

In the same edition, we are introducing the Delta 38 turning machine (see article on page 18). According to Serge Villard, Product Manager, and Arnaud Lienhart, the two products complement one another perfectly! The Delta 38 is an entry-level product which also offers very powerful swarf removal capacity, but has a lower ratio of fixed tools/driven tools than the Sigma 32/6. Also, the Sigma 32/6 has special tools in addition to these, such as the thread whirling unit or the polygon cutter, along with a self-adjusting guide bush, which are not available on the Delta 38 turning machine. Finally, with its mirrored kinematics and the option of digital centring, the Sigma turning machine is a more user-friendly piece of equipment.

New options…

To attract an even larger public, the Sigma offers more comprehensive equipment and a new range of tool holders. These improvements offer users even more flexibility and facilitate their transition into the world of Tornos. It means that it is now possible to equip the Sigma 32/6 with a monobloc chisel holder plate comprising 7 positions. This plate allows the set-up time to be reduced for customers who prefer settings to be made in situ, rather than presetting away from the machine.

To harmonise the systems and reduce machine downtime, it is now possible to opt for a new hybrid horn, allowing motorised or fixed tools to be mounted.

The machine's spray-cooling system has been redesigned and is now a spray ramp external to the tool holder which is located in the machining area of the Sigma turning machine. The tool holder with integrated spray-cooling used on previous versions is, of course, still available and can be adapted for use on the Sigma 32/6. The machine is now undergoing preparation to install the high pressures and the various NC options, such as chamfer or radius on the edge, the polar interpolation and the 64 tool geometries.

Up to 3 tools in the material… for everyone

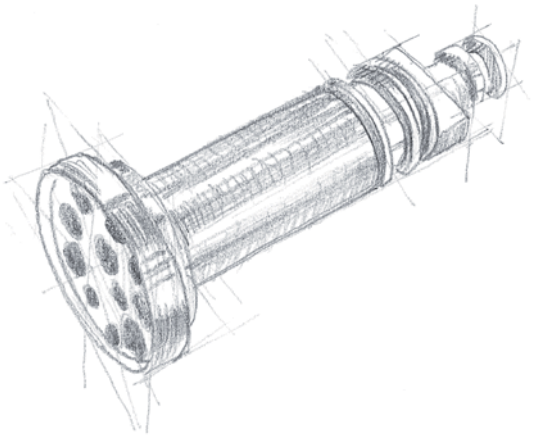
The Sigma 32/6 and its sister machine, the Sigma 20/6 are built on a common platform benefiting from the same options and tool holder. For this reason, the M code-activated pneumatic deburring axis is also fitted on Sigma 20/6 machines. The tool-holder plate and the new motorised horn, not forgetting the other options mentioned in this article, are also available on the latter.

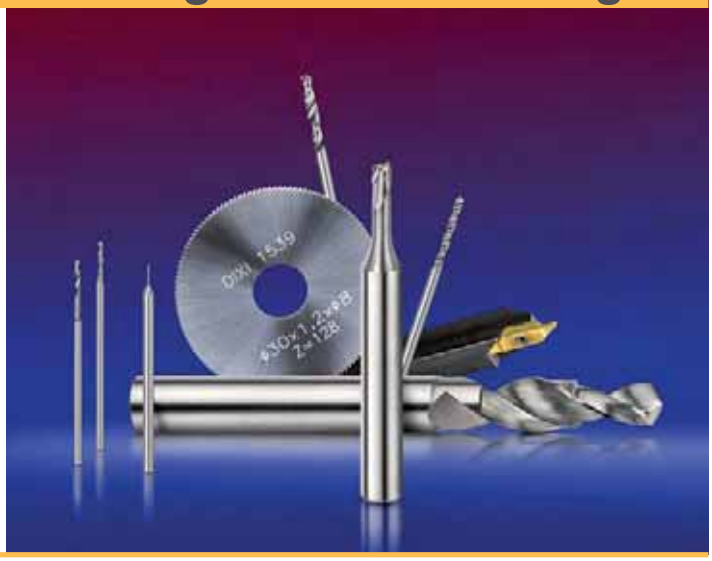
Arnaud Lienhart is convinced that, with these developments, the Sigma 20/6 and Sigma 32/6 will be recognised by customers as an even more competitive, higher performance machining solution.

Tungsten carbide and diamond precision tools

DIXI 4

Turning-screw cutting





Our know how compliments your experience

DIXI POLYTOOL S.A.
Av. du Technicum 37
CH-2400 Le Locle
Tel. +41 (0)32 933 54 44
Fax +41 (0)32 931 89 16
dixipoly@dixi.ch
www.dixi.com

CUT, OR MILL?

The most important challenges in the manufacturing technology for medical and dental engineering components are ultra-high precision, complex geometry, materials that are difficult to cut and a high level of productivity - for parts with extremely small batch sizes. These requirements can be fulfilled on both cutting and milling centres, depending on the geometry of the parts. The latter can even start with bar material!

EMO Hannover 19-24·9·2011

Milling can also take place on cutting centres - and vice-versa. Even if the range of parts that can be covered by both types of machine is continuously increasing in size, there will always be parts that are clearly predestined for one of the two types of machine. Tornos has acquired a respectable market position in the last few years with its single and multi-spindle machines for manufacturing "difficult to cut" components in the medical and dental engineering areas, and also by developing medical engineering-specific machining processes: It is the market leader in Europe, and one of the top three on the global market with more than 300 medical engineering customers. A quarter of Tornos' turnover is now achieved with medical engineering customers.

More possibilities

The integration of machining centre manufacturer Almac in La Chaux-de-Fonds in 2008, has now made it possible for Tornos to cover the milling area as well. However, Almac is not just another milling machine manufacturer. The company's range of ultra-high precision machining centres is the ideal complement for Tornos machinery as far as milling is concerned. Both companies have their roots in high-class machine tool construction in the watchmaking industry. As Almac sales manager Patrick Hirschi explains, about 85% of Almac customers originated from this industry prior to integration in Tornos, and the rest came from the precision instrument manufacturing area, the optics area (spectacle components) and the dental and medical area. *"The global market did not open up for us until the merger, particularly in the medical and dental engineering area. In 2010 the proportion of turnover in this area was already 55%."*

Exemplary modularity

For rational high-precision machining of parts for medical and dental engineering from the starting point of bars or blanks, Almac provides a modular concept that can be exactly tailored to the relevant customer requirements. As a logical continuation of

the multi-spindle bar lathes from Tornos with their typical straight turning technology, Almac provides a machine concept that could be technologically described as "straight milling" with the tilting CNC bar feeder of the FB 1005 CNC bar milling machine.

The machine operates using the X, Y and Z axes as standard. This is completely sufficient for workpieces that are to be machined in these planes. In accordance with its purpose of use, the machine can be equipped with numerous items of standard and special equipment, from frontal, lateral and vertical headstocks with standard or HF spindles to swivelling and partial instruments and tool sensors to cutting fluid temperature control.

For complex workpieces the modular system has additional machining options by means of rotation (C-axis), inclining (B) and a programmed infeed (W). And not least, this bar infeed system achieves a significant reduction in raw material waste. This can be a major advantage when "exotic" and appropriately expensive materials are being machined.

Automated 6-side machining

The compact, but no less flexible and also ultra-precise CU 1007 works in a different way. The standard machine has an installation area of just 2.5 m^2, but allows workpieces with a wide range of complexity to be machined using its three to five simultaneous axes. The special thing about this machine is its expansion and automation capability. When the manufacturing capacity of the standard machine is no longer adequate, it can initially be extended with a feeding and unloading module. However, the integrated Stäubli 6-axis robot does not just look after component handling, but can also be used for subsequent stages of the process such as cleaning, polishing, deburring or for quality control. The spherical working compartment and the high positioning accuracy of this device are not just the prerequisites for fast, flexible and extremely precise automation (component positioning accuracy ±0.03 mm) but also for the next stage of expansion: Since there is also a mirrored version of the CU 1007, the automation module can automate two machines at the same time. The "mirror machine" can be used as an independent second machining centre and/or finish machining the parts taken from machine 1 thanks to the positioning accuracy of the robot - but only after intermediate processing by the robot.

Maximum precision

The vertical axis of the CU 1007 consists of a solid cast prism with four pretensioned linear guides for the X and Y carriages with ball screws, which are driven by brushless digital servo motors. The built-in 1/10 µm glass scales, the temperature monitored coolant circuit and the integrated Bluhm tool preadjusting

system provide the µm precision that is required in these customer segments. The fast tool changers with 30 (optionally 64) positions and the available options such as HF spindles with 80000 rpm, oil/air lubrication or additional high-performance coolant pump provide both precision and maximum productivity, which can be further increased due to the previously mentioned modular expansion and automation capability.

Designed for the most difficult machining conditions

Components for medical and dental engineering typically consist of tough materials that are difficult to cut such as titanium and stainless steel, and often also extremely expensive materials such as gold and silver alloys. The entire machine concept was tailored to these requirements, not just with regard to performance and stability. Even the finest of gold chips can be reliably recycled using appropriate coolant and chip filters. The machining of ceramic materials such as Zyrkon is particularly demanding, particularly in dental engineering. A version of the CU 1007 in which the entire machining compartment is made from stainless steel is available specially for this kind of machining.

Predestined for the medical engineering market

The need for part families is characteristic of the medical engineering market, i.e. extremely similar parts with different dimensions and also small batch sizes. Both machine concepts are precisely tailored for these requirements. The easy-to-program Fanuc controllers also make a contribution. With surgical implants the simultaneous need for screws (turned parts) and plates (milled parts) is also extremely typical. Tornos automatic turning machines and Almac machining centres provide ideal combinations for this purpose, also providing customers with benefits with regard to service, procurement, operator training and programming, because they all originate from the same source.

Typical milled component for 5-axis simultaneous machining on an Almac CU 1007. The associated screws could be provided by a Tornos MultiAlpha 8x28.

Tornos SA
2740 Moutier
032 494 44 44
contact@tornos.com
www.tornos.com

Almac SA
2300 La Chaux-de-Fonds
032 925 35 50
info@almac.ch
www.almac.ch

A MACHINE THAT MAKES WORKING A PLEASURE

The new MultiSwiss machine on display at EMO (see article on page 10) has been delivered to several "test" customers and has been creating workpieces for several months. The machine installed in France at Joseph Martin SA has produced more than 160,000 workpieces and we met Laurent Martin, CEO, and Eric Réthoré, NC Single Workshop Manager by the machine to get their impressions "hot off the press".

"Mr Réthoré started working immediately and efficiently. The machine really has been designed with the operator in mind, and it is also so well-designed that it really makes working a pleasure" – Laurent Martin.

The company specialises in creating complex parts (geometrically or in terms of the accuracy or quality of surface finish required) mainly for the automotive sector, in diameters from 0.5 to 20 millimetres. Expectations for a new numeric multispindle machine with a capacity of 14 mm were very high and Joseph Martin SA quickly declared their interest in testing it out. Mr Martin told us: *"We immediately saw the major potential this machine has for creating small workpieces that we couldn't consider producing on multispindle cam turning machines or for workpieces machined on single-spindle machines for which productivity is not particularly high"*.

An initial workpiece produced on all equipment

To make an effective comparison, the company decided to create a short workpiece, 10 mm in diameter. It is relatively highly machined and requires a number of precise dimensions, in particular a bore with a tolerance of 8 microns. Joseph Martin SA has already created this part on multispindle cam turning machines, but with results that are disappointing on the whole. Mr Martin explains: *"We have produced this part on an AS14, but the tolerances required are at the limit of this machine's capabilities and the reject rate was not satisfactory"*. Then, the same workpiece was created on multispindle

In terms of space requirements, the MultiSwiss is a straight replacement for an ENC single-spindle lathe.

turning machines with the drawback of having to extend the production time or increase the number of machines. Mr Martin told us: *"Production using four different machines is not ideal, as we end up with four populations of workpieces. In terms of repeatability and reliability, there's no guarantee"*. Was the arrival of the MultiSwiss going to fundamentally change things?

Pleasant surprise

Next, the workpiece was produced on the MultiSwiss; Mr Martin breaks the suspense: *"We were completely surprised by the results of the machining. Even without having optimised everything, the quality of the surface finishes and the machining is excellent. In addition to that, the service life of the tools is impressive, and the new hydrostatic bearings work miracles. In terms of productivity, we expect a fourfold increase for our multispindle machines, but we are going to further optimise this aspect, particularly in terms of use of the counter spindle to reach at least a fivefold increase in production"*.

Who would work on the machine?

"We could have chosen an operator skilled in using cam-operated multispindle machines or a specialist in single-spindle machining. We opted for the second option. Also, Mr Réthoré knew a little about machining on multispindles, so it was a logical choice. We decided to place the machine at the heart of our single-spindle turning machine workshop, where a great surprise awaited us: we were able to simply take out an old ENC machine and its feeder and replace it with a fully-integrated MultiSwiss" Mr Martin explained. He noted how highly intuitive the MultiSwiss is and how easy it is to start up and use: *"Mr Réthoré started working immediately and efficiently. The machine really has been designed with the operator in mind, and it is also so well-designed that it really makes working a pleasure"*.

"Fully integrated" solution

Even though the machine has a compact footprint and everything is fully integrated, it still offers all the required peripherals such as filtration, swarf evacuation and the cooling system. Mr Martin added: *"We were also pleasantly surprised on this level. The filtration system is very efficient and even after 160,000 workpieces, there was no clogging in the machine"*. As this first MultiSwiss had been delivered with its chiller, Joseph Martin SA has already made provision for the peripherals to be connected to the company's power network. This can only have a positive effect on energy consumption. Another

integrated element is the PC. Mr Réthoré told us: *"We do not do any programming on the machine, but the integrated PC has simplified how we alter programs. The fact that we also have all the machine documentation on the PC has made our life a lot easier"*. On this subject, Mr Martin added: *"The user also has a search function that they can use to quickly find what they need"*.

Compact footprint

To be able to fit a multispindle machine within a similar-sized space to an equivalent single-spindle turning machine, Tornos obviously had to work a little magic and find technological solutions. The most drastic of these was the decision to have bar loading which was only 1.5 metres in length. Mr Martin told us: *"This technical choice is brave, as the supply chain doesn't currently offer this option as standard. For our part, we have opted for preparation of bars internally. The solution is not ideal, but on the other hand, the loading of 'short' bars has a direct influence on the precision of the machine, simplifies handling, reduces noise and allows greater efficiency, particularly in terms of machining profiled bars. As bar changing is very quick and the scrap length is very short, feeding is not a prohibitive issue"*. According to Mr Martoccia from Tornos, material manufacturers may be ready to start supplying bars of this length… and Tornos is looking into a simplified length adjustment device.

Two new features with undeniable results

Would the hydrostatic bearings on the MultiSwiss and the new torque motor indexing system meet the expectations of Joseph Martin SA? *"We were already familiar with torque motor technology and we didn't have any worries about the disappearance of a Hirth*

A HIGHLY COMPETENT TESTER

To ensure that the MultiSwiss was really pushed to its limits, Tornos wanted "test customers" with perfect understanding of the single-spindle and multispindle "worlds". Joseph Martin SA has been a Tornos customer in these two domains for 65 years, and is renowned for its cutting edge skills.

Company:	a family company founded in 1946
Employees:	160
Turnover:	20 million Euros
Machine bank:	50 cam-operated multispindle turning machines 15 CNC multispindles 30 CNC single spindle turning machines 1 MultiSwiss
Materials machined:	mainly high alloy steels
Facility:	over 7500 m^2 new site of over 10,000 m^2 acquired in 2009
Markets:	more than 80% automotive (specialist in parts for the fluid regulation systems [up to 2500 bar!]) and miscellaneous equipment
Countries:	across the world
Certifications:	ISO TS 16949 – Automotive

gear. The machine is simpler, and with the integrated measuring rules, Tornos has guaranteed precision. For us, the results are perfect". Mr Martin also highlighted the very high quality and precision made possible by the hydrostatic bearings. He added: *"With this machine, we were also able to optimise the cutting speeds and the feedrates. Tornos has created a product of the future, the likes of which cannot be seen anywhere else in the multispindle machine market right now".*

Effective partnership

The reason Tornos wished to test machines in a real-life working situation over several months was so that they could take a machine to EMO which has been proven to be completely reliable. The manufacturer set up a working group so that they could be highly responsive to requests from Joseph Martin SA (and the other test customers). Mr Martin said: *"The conditions for the partnership were ideal. Our exchanges with Tornos were completely open and solutions could be quickly found to anything we deemed less than optimal".* This significantly reduces the risk of "teething problems". Mr Réthoré added: *"They really listened to what we had to say and any issues were dealt with straight away".*

A very competitive price

"During the presentation of the concept, we were immediately interested, but we were asking ourselves how much it would cost. When Tornos told us their price goal, we were very surprised: this kind of solution in this price range would be a real plus" Mr Martin told us.

So long as the price goal set by Tornos was respected by its developers… and that is the case!

And what about the future?

In mid-June the first MultiSwiss installed received an update based on the requests and remarks from Joseph Martin SA. Mr Martin concludes: *"Once it has reached operating temperature, the machine's temperature response is irreproachable. The MultiSwiss has a preheating system, and this was another area where we put forward some ideas for Tornos to take further. We are very pleased with the machine and are already planning for the next ones, the second should replace 4 single-spindle machines and we are thinking of a chucker version for the third… even though this doesn't yet exist".*

Joseph Martin SA
491, rue des Fontaines
F-74130 Vougy
Tel. +33 450 34 59 55
Fax +33 450 34 02 51
www.martin-joseph.com
info@martin-joseph.com

THE µ IS STANDARD

A robot used in spinal surgery can guarantee the positioning of pedicle screws to within a few microns, thanks to the precision of the ball bearings - components of the actuators on the hexapod robot manufactured by MPS. Behind such precision stand experienced specialists and high-precision machines such as the EvoDeco 16 from Tornos.

Robert Meier, independent technical journalist

MPS CEO, Nicola Thibaudeau, knows what her customers expect: maximum precision together with absolute reliability. That is why she relies on Tornos automatic turning machines.

The abbreviation MPS stands for "Micro Precision Systems". The name itself speaks volumes about the company. Not only that MPS manufactures micro-precision ball bearings, but that the company offers a great deal more, namely complex ball-bearing mounted precision systems and built-in motors for highly specialised use in the most advanced industrial and medical sectors. In order to do so, the company relies on machinery that provides the high degree of accuracy it needs.

The µ in the blood

"For us, micro precision is not just a production feature. We live and breathe it each and every day." When Nicola Thibaudeau, CEO at MPS, speaks about her products, her voice resonates a certain pride: *"We don't just supply precision bearings, we manufacture high-precision, ball-bearing mounted systems for our customers."* The company and its 250 employees focus on precision guidance systems for linear and rotary movements for

demanding applications. Customers come from the watchmaking industry, manufacturers of medical devices and producers of devices for optical and industrial applications. The manufacturing range includes both ball screw bearings for linear guidance systems and special ball bearings for the watchmaking industry and others. *"With stainless steel or ceramic ball bearings we are working, for example, with diameters from 0.200 to 1.588 mm at a roundness precision of 0.08 µ and a maximum surface roughness of 0.01 µ."* As if these figures are not enough to define "micro precision", Nicola Thibaudeau continues: *"In the case of ball-bearing mounted precision systems, we have an ingenious selection process which means we can achieve play of just 6 to 12 µ."*

Jean-François Bilat, Head of Machining and Surface Technology (behind), and Eric Pesselier, Head of Machining, are convinced by the new EvoDeco 16 from Tornos

The scalpel is positioned with a precision of 0.05 mm

The result of this type of selection is apparent, for example, in the guidance system for a laser used in surgery: *"The surgeon uses the instrument's arm to guide a high-precision laser beam to the operating site. This arm features four joints. Nevertheless, the laser can be guided within a tolerance of just 0.05 mm with the arm extended. And with our ball bearing systems it can do this successfully and repeatedly"*, explains Nicola Thibaudeau, *"In order for us to achieve such a result, we need capable employees and superior machinery."*

A uniform machine shop brings flexibility

In the spick and span turning department, the automatic turning machines from Tornos stand in serried ranks. Jean-François Bilat, head of the Turning department, justifies this choice: *"We are wholly satisfied with this manufacturer, which is why we continue to rely on it. The fact that our machine supplier is so close geographically is very important to us. If there is a fault, the service staff are on site within a short time and any spare parts we need also reach us promptly.*

This is very important for safeguarding our production. In addition, there is the fact that as a rule we work with small to medium production runs, which means we need to perform a lot of set-ups. To achieve this, our staff are flexibly deployed on the various automatic turning machines. A uniform machine shop allows this kind of rotation with no loss in production or quality. On top of that there is an important opportunity to make big savings on our machinery. A uniform machine shop allows us to produce the same part on various machines from the same manufacturer using the same tools and programs. This gives our Turning department a very high degree of flexibility."

Seeing is believing

The Turning department was so busy that there has been a call to expand the machine shop.

Eric Pesselier, head of Turning, comments: *"We had initially decided in favour of a new Deco 13 from Tornos. Then we saw the EvoDeco 16 at the last Prodex. Since this new model brought several improvements compared with the Deco 13, we*

decided to investigate the matter more extensively and also checked out the new automatic turning machines at the Tornos factory in Moutier. We found the concept so convincing that we opted for this machine." Jean-François Bilat adds: *"The machine meets our specifications with regard to swapping the tools around. The kinematics and the programming, which is identical to that of the Deco 13, give us great flexibility with regard to the type of part and make it easier for us to rotate our staff, giving us an advantage in terms of staff training. In addition, the fact that we can use bigger bars with a diameter of 16 mm opens up new potential for future projects."*

Eric Pesselier welcomes the extra ease with which the automatic turning machine can be set up now that the control is built onto a rotary arm.

The clearly visible recess above the working area is attributable to the integration of this part of the casing in the sliding doors. A feature that is greatly appreciated by the turning machine operators.

Pleasing ergonomics

The two specialists were quickly convinced by the EvoDeco 16, as Jean-François Bilat confirms: *"The machine's ergonomics compared with the Deco 13 have been significantly enhanced; improved illumination in the working area makes it considerably easier to set up and change tools during production. This is particularly important in terms of our small production runs and prototypes. Also, the fact that the control panel is now attached to the rotary arm and can be articulated for setting up and any other interventions is not only convenient but makes it considerably easier to work on this machine."* Eric Pesselier confirms these enhanced ergonomics: *"The redesigned access doors to the machining area are also a 'small' modification that has a great effect. Our employees really appreciate the way the access door to the machine enclosure has been enlarged, as this provides better ventilation while they are working in the machining area!"* Large production runs tend to be an exception at MPS, and there are also practically no parts families to manufacture, which means the machine often has to be newly set up. Jean-François Bilat comments, laughing: *"Sometimes it takes longer to set up than it does to manufacture the batch of parts."* That is why it goes without saying that the two managers assign great importance to the machine's ergonomics.

Surprising stability

The new automatic turning machine demonstrates its great strengths in productive operation. Eric Pesselier is pleasantly surprised: *"Precision has always been our core competence. And this is where the Evo Deco 16 gives us considerable support. We very*

The turning machine operator has access to a whole armada of measuring instruments immediately next to the automatic turning machine for safely and efficiently testing the quality of turned parts.

quickly saw that the machine was extremely stable. Running-in after a weekend standstill has become much briefer; After as few as 4 or 5 parts or so this automatic turning machine has already reached high long-term thermal stability. In very general terms, the EvoDeco demonstrates impressively high uniformity in the productive phase. Even with high-precision turned parts we achieve a constant precision of +/- 5 µ, and that also applies to bigger production runs. Because the machine is so reliable, the employee working on the machine even has more freedom now to do other things." Despite everything, the turning machine operator checks the parts every 20 minutes owing to the very strict tolerances imposed by MPS. Any corrections are very easily introduced into the CNC control during productive operation.

Plenty of power and yet still as quiet as a mouse

The Turning department at MPS favours the manufacture of parts from highly resistant stainless steel or titanium, in diameters from 2 to 13 mm and lengths from 2 to 250 mm. According to Eric Pesselier: *"Both the main and counter spindles are directly driven with synchronous motors and their rigidity and removal rate are discernibly and convincingly superior. For this reason, and thanks also to the stability of the EvoDeco, we can machine bigger parts with deeper passes, which makes for better chip removal. We are pleasantly surprised here that this machine also makes less noise than previous machines, even under heavy load, thanks to the elimination of belt-driven main and counter spindles."*

Rigourous checks

MPS is certified to ISO 13485 and has a clean room for putting together assemblies that are mainly used in the field of medicine. Nonetheless, this kind of production facility is also checked regularly, explains Jean-François Bilat: *"We record and analyse our parts checks statistically so that we can identify any deviation trends very early on in the production cycle. In addition, external and internal audits ensure that our quality is always of our customary high standard, because even though our customers are scattered around the world they regularly check our operation, especially our production equipment, and very thoroughly, too. Regular 5 S inspections on our machines to check their operation and maintenance have enabled us to observe a marked improvement in leakproofing. And that is where the EvoDeco 16 has given us another surprise: it's no longer necessary to clean the trough as often as we used to. So the machine is also remarkable because it is so very leakproof."*

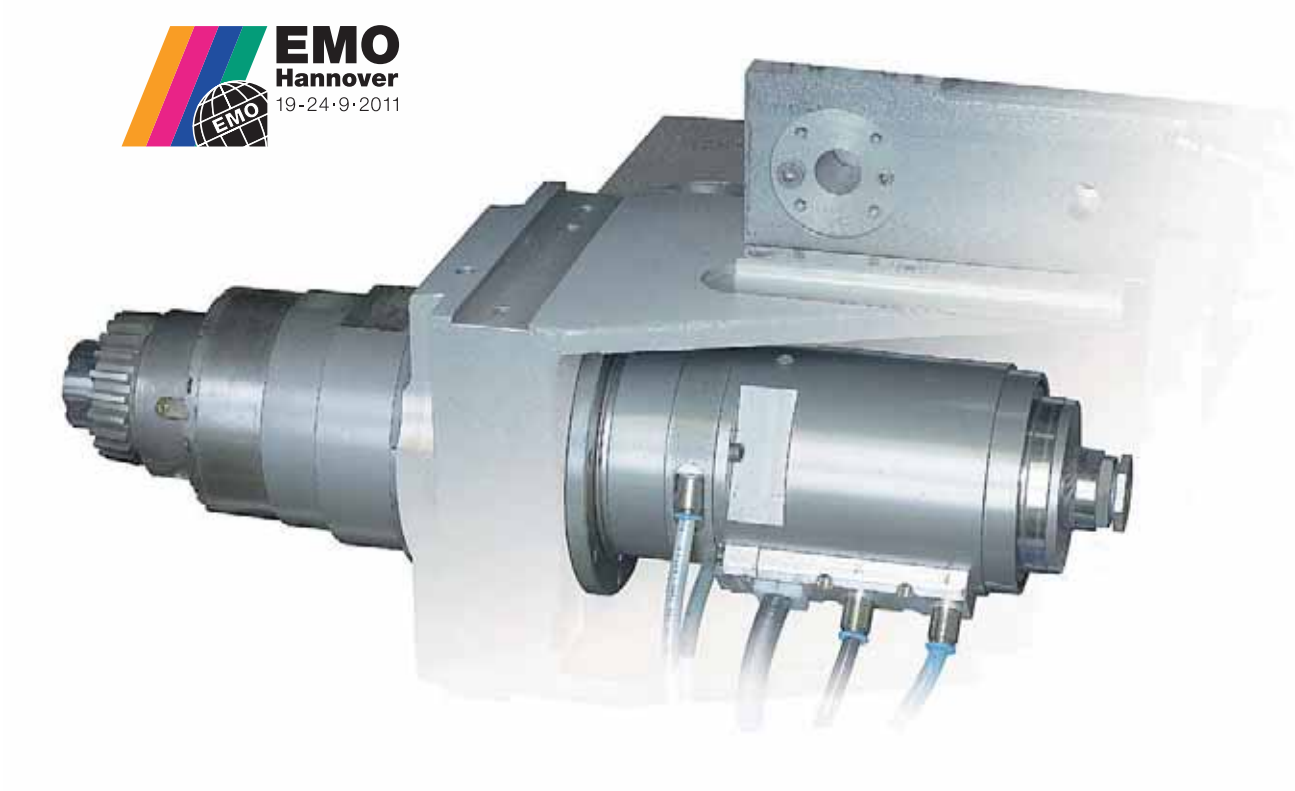
Totally convinced

Both Jean-François Bilat and Eric Pesselier are very impressed by the new EvoDeco 16. And so is the whole team, explains Mr Pesselier: *"Our team of turning machine operators prefers working on the EvoDeco."* No wonder that the next automatic turning machine, which has already been ordered as part of the production capacity expansion, is another EvoDeco 16.

MPS Micro Precision Systems SA
Ch. du Long-Champ 95
PO Box 8361
CH-2500 Biel/Bienne 8
Switzerland
T +41 32 344 43 00
F +41 32 344 43 01

ALWAYS AT THE RIGHT TEMPERATURE

With the launch of the EvoDeco 16a and the EvoDeco 10a, Tornos demonstrates yet again that customer needs are its clear priority. Proven solutions have been retained and purposefully enhanced with innovative technologies. For these lathes, Tornos has integrated a new feature: motor-driven main and counter spindles. The increase in power output is obvious. For perfect cooling of the spindles, Motorex, as part of an R&D collaboration with Tornos, has developed the VOC-free Motorex Cool-Oil spindle fluid.



The motorised spindles for the EvoDeco 16a and 10a were developed inhouse at Tornos and are manufactured in the factory in Moutier, Switzerland. The spindle shown, from the EvoDeco 16a, delivers 9.8 kW and achieves a maximum torque of 12 Nm at a maximum rotation speed of 12,000 rpm.

Compared with previous drives, the main spindles fitted in the EvoDeco 16a and 10a offer a major, and sometimes more than two-fold, increase in power output. The motorised spindles developed and assembled at Tornos are characterised by their ultra-fast responsiveness. Even for the machining of complex workpieces with a number of stops, synchronous motor technology is an outstanding solution. The significant increase in responsiveness helps to save time in any acceleration movement and reduces time per piece considerably.

A lot of power makes a lot of heat

Whenever a great deal of power and high torques are demanded, this has an immediate impact on the entire thermal behaviour of the machine. This aspect also has direct relevance for precision. For these reasons, the EvoDeco 16a and 10a have a continuous supply of cutting and cooling oil, which continues to cool the workpiece and the tools even after the machine has stopped. In addition, this function can be conveniently controlled by timer programming.

In practice, the machine must reach operating temperature rapidly after it has been put into operation. From this point, only minimal temperature changes can be tolerated. Every fluctuation in temperature has a direct effect on the machining components of the lathe. To ensure that the heat of the high-speed spindles can be carried away, the development team behind the concept placed particular focus on the spindle coolant and on the entire, substantially sized cooling system.

Ambitious specifications

Having many customers in the medical industry and other truly high-tech sectors, Tornos opted for an oil-based spindle coolant. This is because a water-miscible spindle coolant could, if it were to mix with the cutting oil, introduce problematic substances or even germs into the machining circuit. Tornos development engineers briefed the lubrication engineers of Motorex with their desired requirements profile for the cooling medium. In contrast to the oil-based spindle cooling fluid available on the market at that time, the new Motorex development was to be a VOC-free but nevertheless highly efficient longlife coolant for use at machine and component level.

Designed for high performance, the synchronous motorised spindle is an important factor for success. Good to see: the two transparent supply lines for the spindle cooling fluid.

"By developing a synergy project with Motorex, we were able to incorporate our requirements for the new product as well as many important findings from our business from the very beginning. Motorex Cool-Oil perfectly fulfils our requirements, is particularly environmentally friendly and is cost-effective all at the same time!"

Clovis Brosy
leader of the R&D team
Tornos SA, 2740 Moutier

The new Motorex Cool-Oil development

After what must have been a record-breakingly short concept-to-product time, the first laboratory mixtures were able to undergo various field tests at Tornos in the development division in Moutier. It was immediately observed that the flow rate through the cooling circuit from the spindle to the supply tank via the integrated cooler also makes a key contribution to cooling performance. For this reason, the lowest possible viscosity was selected. Combined with a high heat capacity, this enables maximum transfer of thermal energy. Motorex Cool-Oil is a mineral-oil-based, water-immiscible coolant for high-frequency spindles. Its composition enables it to transport and carry away heat efficiently. Thanks to a cleverly formulated additives package, the spindle cooling oil also protects the wetted components of the machine from corrosion.

Motorex Cool-Oil additionally offers the following properties:

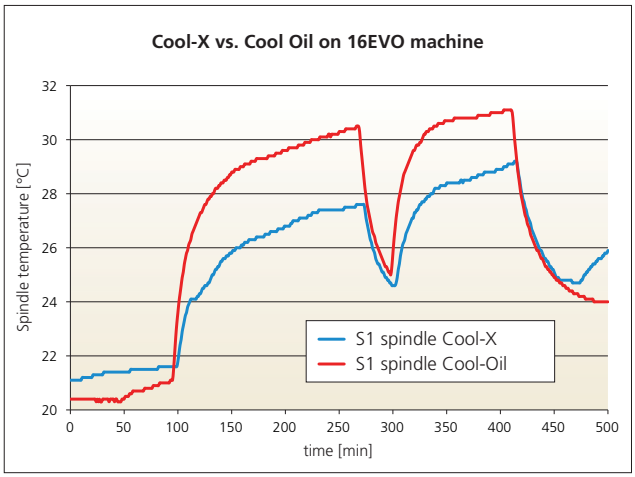
- Good heat transfer capacity
- Excellent material compatibility
- Free of aromatics and VOCs
- High flash point
- Outstanding longlife anti-corrosion protection
- Maintenance-free
- Not a dangerous substance

The spindles fitted are manufactured at Tornos and impress with their powerful performance and robust construction. During maintenance, replacement spindles are available to the customer.

Each individual spindle is tested and run in before installation. The results are documented on a test report and stored accordingly. The spindle bearings are grease-lubricated.

The entire cooling system holds up to 20 litres of spindle coolant. The integrated oil cooler keeps the temperature of the medium constant within a defined range. Various built-in sensors monitor and protect the system.

The complete spindle cooling system holds approximately 20 litres of spindle cooling fluid. The fill level can be seen easily on the expansion tank. The spindle coolant has high ageing stability and, therefore, does not need to be changed.



The chart shows the respective temperature curves of a test cycle with the water-miscible spindle coolant Motorex Cool-X and with Motorex Cool-Oil. The greatest temperature difference between the water- and oil-based coolant did not even exceed 3 °C. With the selection of Motorex Cool-Oil, the overriding factor was unequivocally the safety aspect given the potential for mixing with the processing fluid.

Factory-filled and manufacturer-approved

Motorex Cool-Oil is added to the spindle cooling system during production and can remain in service until the spindles require maintenance. Cool-Oil is also listed as an approved spindle cooling fluid in the maintenance booklet and is available directly from the Tornos sales network. The product is a new addition to the existing spindle line of Motorex, which includes all fluids for all spindle systems.

We would be delighted to inform you about this new development and provide you with a proposal detailing the potential for optimisation in the lubrication engineering area of your organisation:

Motorex AG Langenthal
After-sales service
Postfach
CH-4901 Langenthal
Tel. +41 (0)62 919 74 74
Fax +41 (0)62 919 76 96
www.motorex.com

NEWS FROM OUR SATISFACTION SURVEY

In decomagazine Issue 56, we included a satisfaction questionnaire and asked for your help in improving the way we work. We are now pleased to be able to reveal the results of the survey.

Almost 150 companies across 4 continents took part and returned the questionnaire - a real success story. Therefore we would like to thank all those who took the time to participate in the survey. We believe this success is due to the interest you have shown in our company and products.

The survey covered the same subjects and issues as those already surveyed in 2006 (after-sales operations, spare parts, documentation and technical training). New subjects were also covered, including pre-sales support, the capacity for innovation and the quality of our products. Like the survey of 5 years ago, each question included two criteria: the level of importance and the level of satisfaction.

Increased requirements

For the questions we had already asked, we noted that the our customers' requirements were gradually increasing. At the same time, their level of satisfaction had generally risen. As an example, let's look at the delivery time for our spare parts. The increased level of importance our customers have assigned to this factor reflects the pressure their customers are placing on them. This criterion received the lowest satisfaction rating in the 2006 survey, and we have done a lot of work on it since then. The result is that the average delivery time has been significantly reduced, while our customers' satisfaction level has increased.

In addition to this result, our continued improvement efforts have also been rewarded, with the majority of our customers now stating that our delivery times are better than those of our competitors. This serves as a reminder that, as in the past, we still need to remain creative in order to provide our customers with innovative solutions.

Encouraging results

In general terms, we can proudly reveal that of the 33 points covered in our survey, our customers consider us on average to be better than our competitors in 31. This recognition will certainly help motivate us in our future operations.

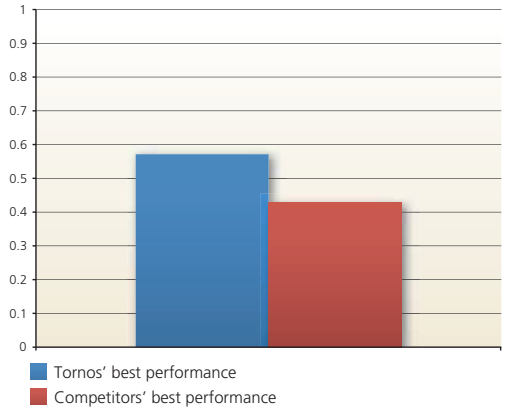
A final point to highlight relates to satisfaction levels. This does not vary significantly in terms of the subjects covered in the survey, receiving a score of 4 on a scale from 1 to 5. It is highly encouraging to be perceived in positive terms in all the areas covered in the survey. However, we must keep in mind that our customers are keen for us to continue our improvement efforts with the aim of achieving excellence.

A base from which to constantly serve you better

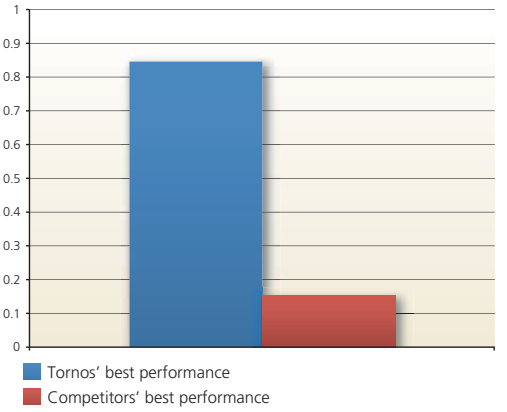
In summary, as we have done in the past, we will analyse in greater detail the various data gathered from the questionnaire and take corrective measures in order to increase your satisfaction with our service. This is natural for a company like ours that is resolutely customer-focused.

Philippe Hermann, Tornos Sales Analyst

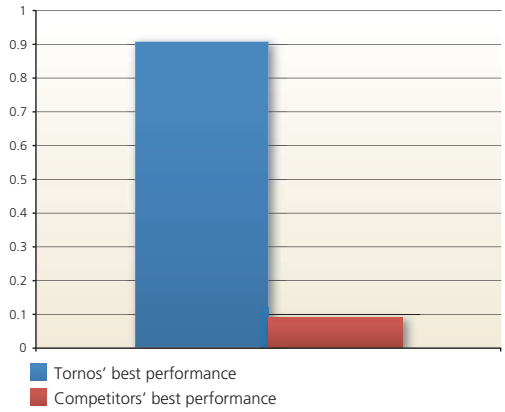
Time between your call and the arrival of the Tornos technician on site



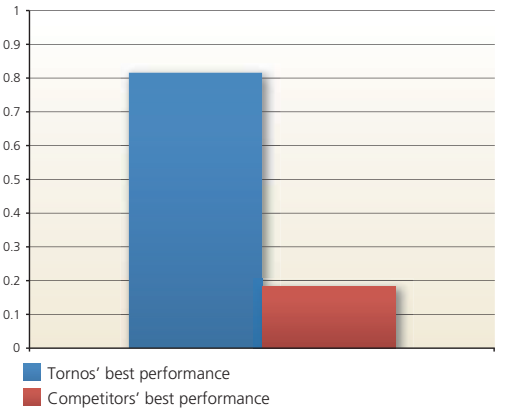
Delivery lead time after your order was placed



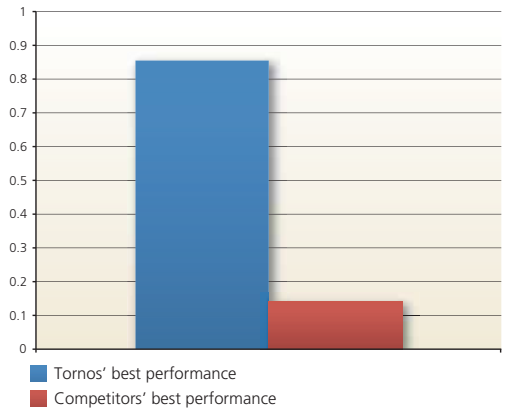
Level of expertise/skill of the After-Sales technician



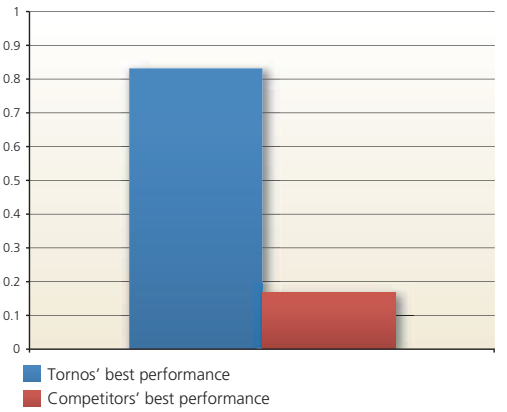
Quality of the work carried out by the After-Sales technician



Quality of Tornos machines upon delivery



Skill level of our application engineers and the added value they bring to the machine sales process



Mini-Pendelhalter MPH		Petit Mandrins Flottant MPH		Small Floating Chuck MPH	
Zange	ER 8	Pince	ER 8	Collet	ER 8
Spannbereich	0.5–5 mm	Capacité de serrage	0.5–5 mm	Clamping range	0.5–5 mm
Pendelweg	0.25 mm	Oscillation	0.25 mm	Floating range	0.25 m

[mph]

stampfli
PRECISION TOOLS

Andreas Stampfli · Solothurnstrasse 24f · 3422 Kirchberg · Switzerland · Phone ++41 34 445 57 67 · Fax +41 34 445 67 29 · www.andreas-stampfli.ch

« Tests have shown that a performance increase of up to 40% is possible with Blaser cutting oils.»

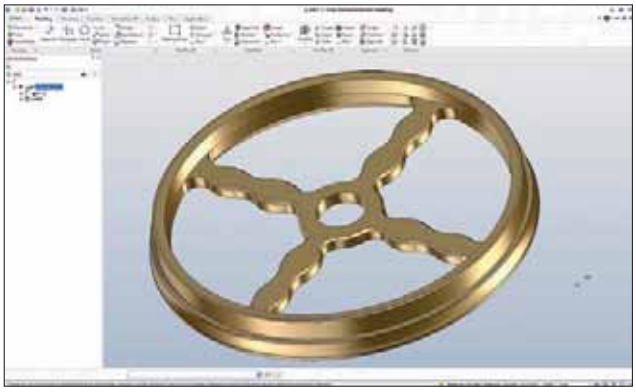
Daniel Schär
Product Manager, Mechanical Engineer Dipl. Ing. FH

We are happy to serve you.

www.blaser.com
e-mail: liquidtools@blaser.com Phone: +41 (0) 34 460 01 01

SAVE TIME WITH MASTERCAM SWISS EXPERT

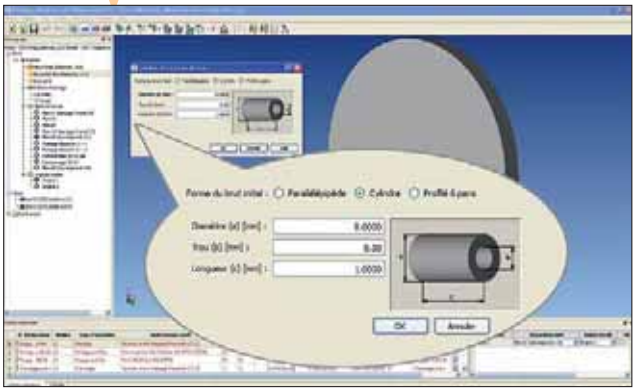
In June 2010, CNC Software, a world leader in CAM and publisher of the Mastercam CAM software, acquired the SylvieXpert software, renamed Mastercam Swiss Expert for its 2011 version. At the start of the year, the CNC Software Europe SA subsidiary was established at Porrentruy to serve as a worldwide centre of competence dedicated long-term to the control of bar turning machines. This article explains how to work with this software in order to commission machines in record time.



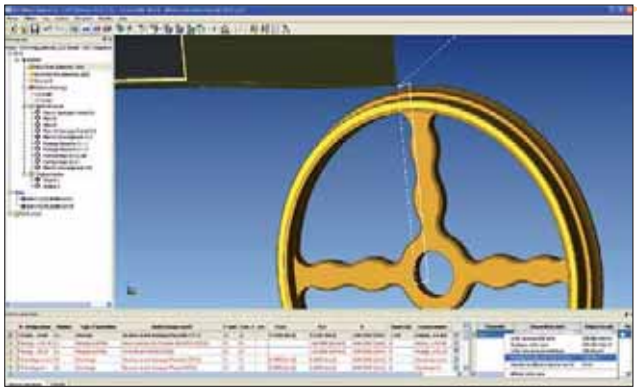
1 In our scenario, a balance needs to be machined on a Deco 13a machine. The bar turner receives the new numerical template for the balance.

2 The bar turner opens a project in the Mastercam Swiss Expert database.

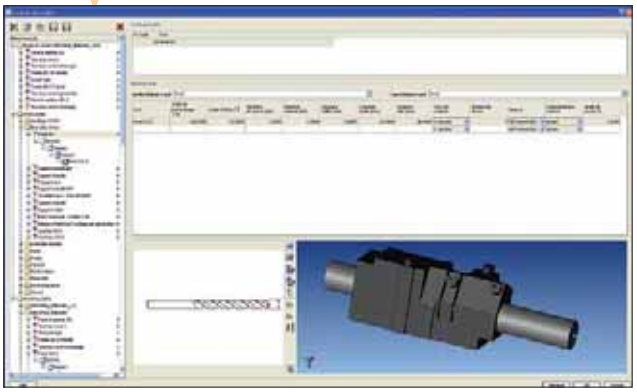
3 After saving the project under a different name, the user imports the new 3D template. The operations are classed as incomplete as they need to be linked to the new geometry.



4 The first stage involves creating a 3D blank for the part using software indicating the maximum dimensions of the finished part.

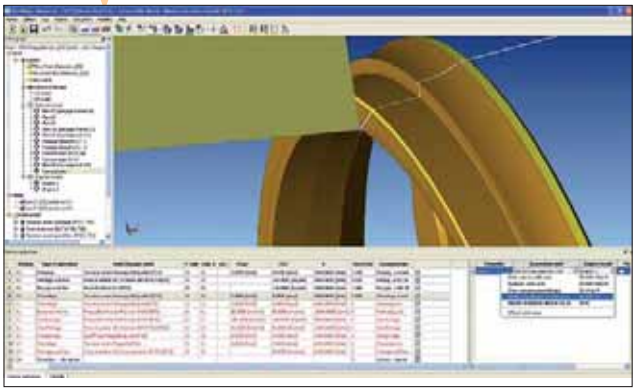


5 To link the operations to the new geometry, the user need only click on the geometric element, as shown here on the front.

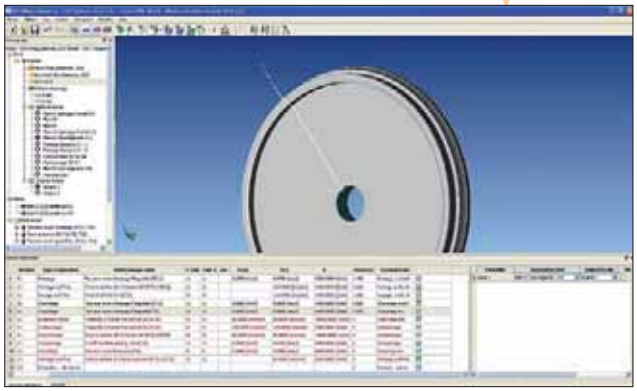


6 Boring takes place in the same way. For the drilling, which is of a different diameter, another bit must be selected from the library, which contains more than 3,000 components.

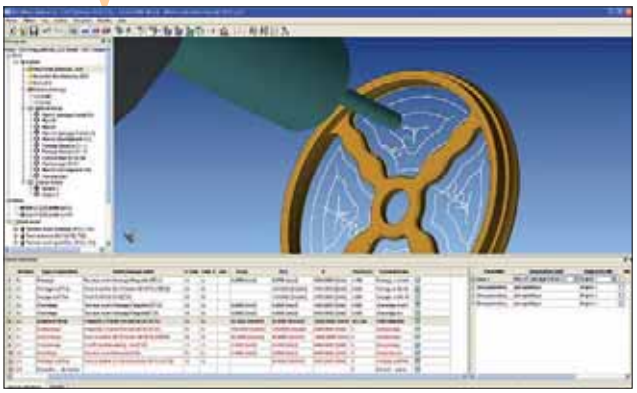
7 Selection of the hole, in yellow here, determines the machining operation for the boring and central drilling. The valid operations are in black.



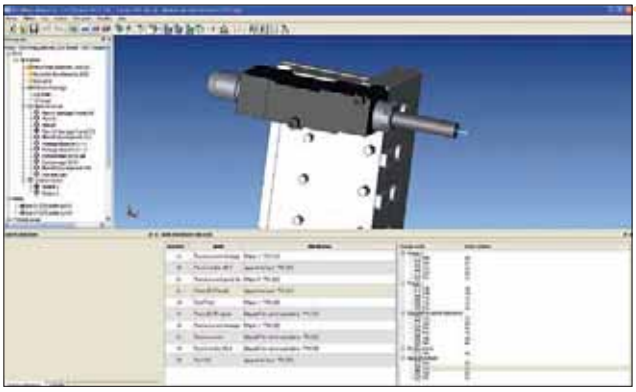
8 The first and last faces must be selected for the new turning direction. The path is calculated automatically.



9 The internal turning direction is selected in the same way. At each stage, the software indicates and manages the removed material.

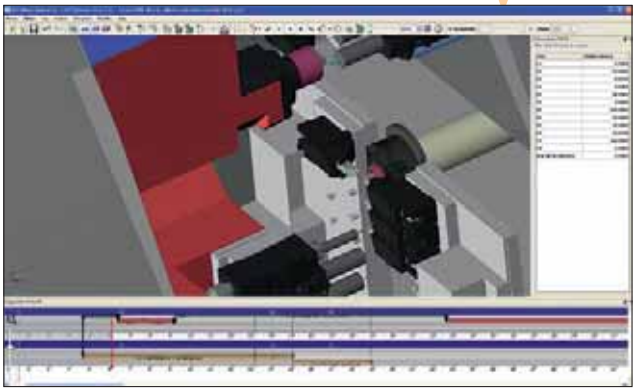


10 The new geometry is selected by clicking on an edge then asking the system to find the tangential edges. The "duplicate area" function is used to machine the other 3 pockets.

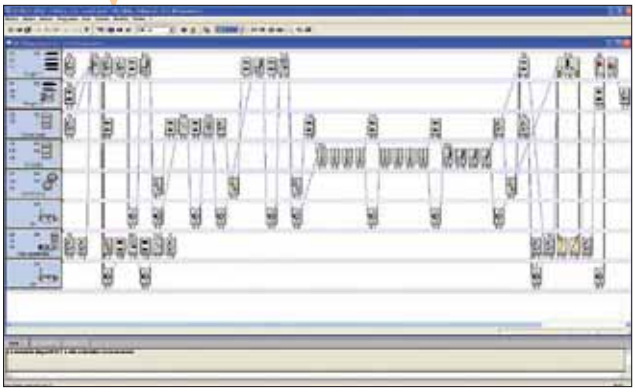


11 To finish machining, each operation must be linked to the new geometry. The system then automatically places the tools in the correct positions on the bar turning machine according to the tool numbers.

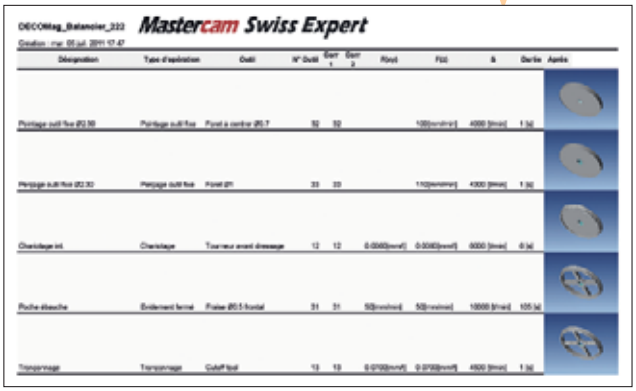
12 The bar turner then selects the working axes in case of colinearity, for example, between Z1 and Z3, and defines the synchronisations and constraints using a Gantt chart.



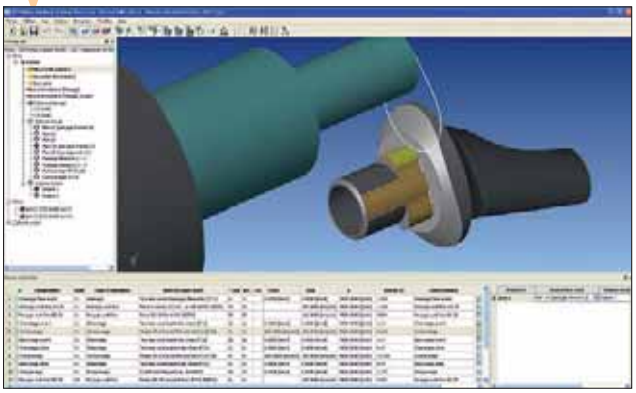
13 Simulation is used to detect any collisions or travel anomalies. The machining time is calculated. If a tool needs to be moved, the bar turner will realise at this stage, before the operation is started on the machine. The bar turner can also optimise the operation between the main and secondary spindles.



14 When programming is complete, the information is exported to TB-Deco in Tornos' proprietary ".ttft" format. With Mastercam Swiss Expert, TB-Deco automatically recognises the type of MOCN, in this case DECO 13a, and the program is generated as if it had been entered manually.



15 Mastercam Swiss Expert allows workshop documentation to be generated automatically, for example, the list of operations including tools and machining times.



16 Likewise, other parts can be easily programmed, for example, for the medical and dental sectors, making optimal use of the company's inventory and expertise.

Technical

In our scenario, a few minutes were enough to go from programming one type of balance to another without entering geometric values. In summary, Mastercam Swiss Expert makes it possible to quickly create a new part using accrued bar turner resources such as:

- old programs to be adapted
- the tools used previously on the MOCN
- the 3D tool library supplied with the software
- template ranges with technological parameters.

The advantages compared to manual programming, and even prior to startup:

- automatic generation of the geometries to be machined, with no risk of errors
- programming of all types of MOCN
- calculation of the machining time
- detection of collisions and travel anomalies.

Mastercam Swiss Expert

published by:

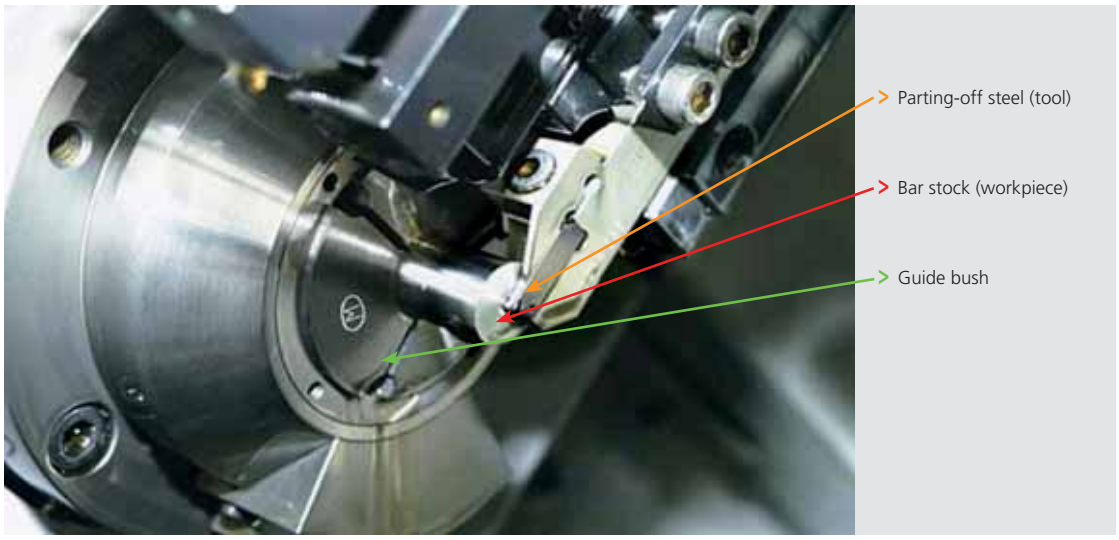
cnc software, inc.
Tolland, CT 06084 USA
Call (800) 228-2877
www.mastercam.com

Development centre dedicated
to bar turning:
CNC Software Europe SA
CH - 2900 Porrentruy, Switzerland

Marketed in Swiss French:
Jinfo SA
CH - 2900 Porrentruy, Switzerland
www.jinfo.ch

CHLORINE-FREE OILS FOR FIXED GUIDE BUSHES

On many occasions, customers and machine manufacturers have consulted Blaser Swisslube, the coolant and lubricant manufacturer based in the Emmental region of Switzerland, to find out whether we could recommend a chlorine-free cutting oil for fixed guide bushes.



Particularly in the case of parting-off or turning operations, in which high radial forces are exerted, experience shows that the use of chlorine-free oils tends to result in welding between the bar stock and the fixed guide bush.

As our experience showed that no such oil was worthy of recommendation, our research and development division took on the technically demanding challenge of developing one. This initiative was typical of our company – since its inception, Blaser Swisslube has forever been interested in technological progress and has always been driven by the demanding needs of customers and the requirements of the market.

On older lathes and where there are requirements for maximum dimensional accuracy in the machining of small diameters in stainless steel, fixed carbide guide bushes still continue to be used. The purpose of the guide bush is to guide the bar stock and prevent the material from being forced away under the cutting forces of the tools. Fixed guide bushes make it possible to reduce play virtually to zero in the turning of long parts. They compensate for the oscillations that may occur, especially in the machining of long workpieces. Even with long workpieces, therefore, a high degree of accuracy is guaranteed.

Stainless steels with small diameters make great demands on the cutting oil. Particularly in the case of parting-off or turning operations, in which high radial forces are exerted, a lack of anti-weld protection may result in the bar stock adhering to the fixed guide bush. This undesirable phenomenon is observed above all when chlorine-free oils are used. Chlorinated oils usually overcome this difficulty quite well. With chlorine-free oils, the bar stock can be prevented from welding to the guide bush by the use of revolving guide bushes mounted on needle bearings. However, revolving guide bushes mean increased play and, consequently, reduced dimensional accuracy for the workpiece. Furthermore, some machinists have no option but to work with

Unwelded guide bush

Welded guide bush

a combination of fixed guide bushes and chlorine-free oils. On more modern machines, synchronised, revolving guide bushes can alleviate this problem 100%.

The search for a chlorine-free solution delivers Blasomill 15

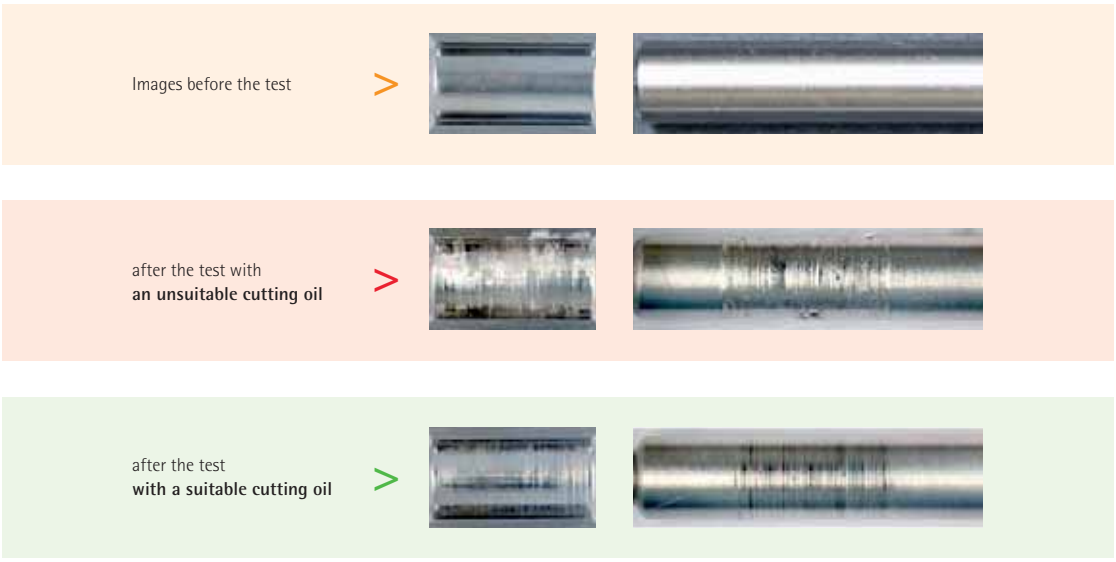
To start with, Blaser Swisslube developed a special test that made observed behaviour reproducible in a real-world environment.

Thanks to this test procedure, which replicates near-real application conditions, the team succeeding in developing the chlorine-free solution and managed to streamline the usually protracted procedures that would otherwise have been required for field testing by customers.

New formulations

The test reveals which cutting oils tend to allow the welding of stainless bar stocks and which ones are effective against it.

The search began to find new chlorine-free formulations that would help to achieve a significant reduction in the tendency to weld after a blend of highly developed additives. These findings were



incorporated into Blasomill 15, the only chlorine-free cutting oil of its kind for carbide guide bushes.

Before any new development is brought to the wider market, Blaser Swisslube puts it to trial by lead users. It is only when the desired result has been achieved at these customers under real production conditions that the solution is approved for sale. In this phase, other product characteristics are observed, including important aspects such as odour neutrality, kindness to skin, low atomisation, machine compatibility and ease of parts cleaning. When a new formulation also fulfils these expectations, the product is deemed to have reached the desired maturity level and is ready for market.

Available viscosities

For many bar turning applications, viscosity 15 is the ideal choice. Depending on the workpiece size and the machining mode (roughing or finishing), a less or more viscous cutting oil may prove beneficial. We want to be able to offer our customers the optimum solution whatever the application. For this reason, Blaser Swisslube has made this new chlorine-free high-performance cutting oil available in various viscosities, from 5 to 32 mm²/s at 40 °C.

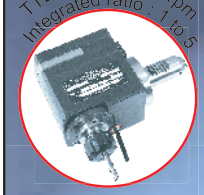
Further information:

Blaser Swisslube AG
CH-3415 Hasle-Rüegsau
www.blaser.com
contact@blaser.com

PIBOMULTI
SWISS MADE
JAMBE-DUCOMMUN 18
CH-2400 LE LOCLE
TEL +41(0)32 933 06 33
FAX +41(0)32 933 06 30
www.pibomulti.com - info@pibomulti.com

Specific equipment and accessories for lathes

TTE 10X5 18'000 rpm
Integrated ratio : 1 to 5

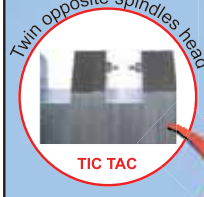


Minispindle Extensions
Ø5.0 mm collets Ø2.0 mm

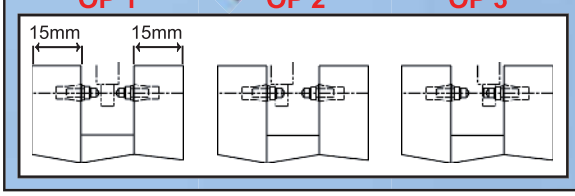
Multispindle head
small spindle axis distance
4 mm
revolution
15'000 rpm

Synchronous multispindles Head

Twin opposite spindles head



OP 1 OP 2 OP 3



Specific equipment and accessories for TORNOS machines

Hobbing unit
for making gears

Polyvalent drilling and milling head
for heavy machining with speed-reducer
Usable with or without over-arm

Right angle spindle speeder
5 mm clamping capacity
15'000 rpm

Adjustable angle head
with range of adjustability
from 0 to 90°
5 mm clamping capacity

ASK FOR OUR FULL RANGE CATALOGUE !

Axial spindle speeder
8 mm clamping capacity
30'000 rpm

Whirling machine

6 spindles multispindle head

BMRC

Modular spindles
for presetting outside
of machine

Milling head - Spindle speeder - Angular head - Whirling machine - Drilling heads ....

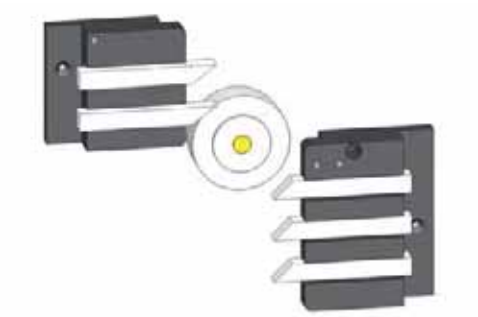
3 INNOVATIVE SOLUTIONS TO INCREASE THE NUMBER OF TOOLS ON YOUR AUTOMATIC TURNING MACHINE

The increasing complexity of bar turning workpieces requires an ever greater number of operations and, therefore, a greater number of tools on automatic turning machines. Bar turners end up finding themselves limited by the capacity of their machines in terms of tool positions, and new solutions need to be found. Bimu looked into the issue and has developed several innovative concepts, three of which are presented below.

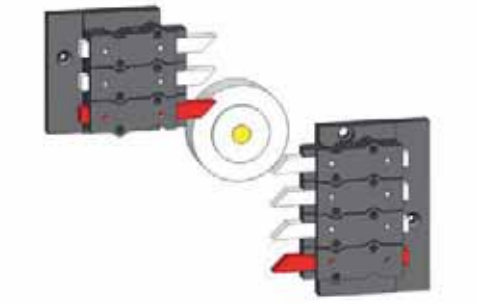
1. Two tool holders added on Tornos Delta

The Tornos Delta 12/20 is factory fitted with two plattens, on which two and three tools are mounted respectively. Bimu has redesigned the geometry of the plattens so that 3 and 4 tools can be fitted to them respectively, thereby bringing the total number of chisels to between 5 and 7.

Standard configurations



Bimu Configuration with two additional tools

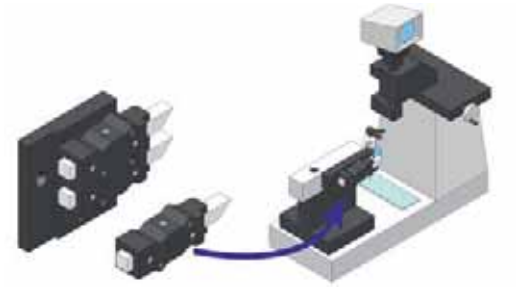


This new system can take any tool with an 8x8 or 10x10 mm section (brazed chisel or tipped tool); the customer can therefore keep the tooling that was used on the standard configuration.

In addition to gaining two tool positions, this system also offers the advantage of a presetting option.

In fact, the tool holders which hold the chisels can be easily transferred onto a Tornos presetting device, by means of a special plate fixed on the latter.

Presetting for Tornos Delta 12/20 possible on a standard Tornos Deco presetting device

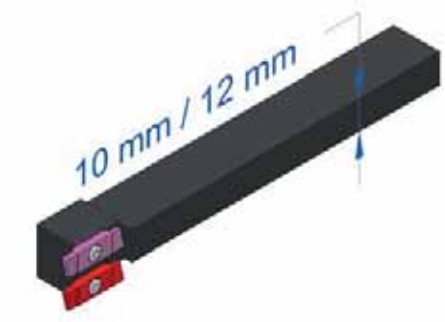


This brand new tool holder system for Tornos Delta is already being used by a number of bar turners who are very pleased with the results.

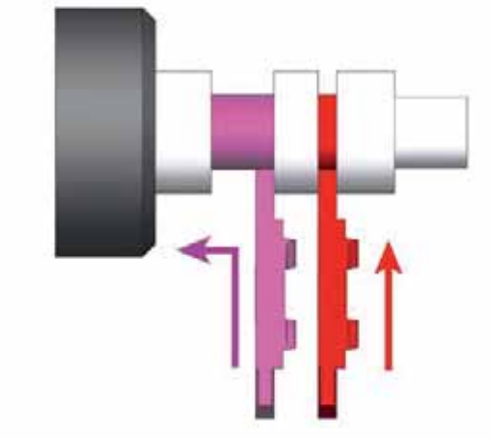
2. Dual tool holders for machines using standard tool holders with a 10 or 12 mm cross section

To compensate for the lack of tool positions which may be present on machines, Bimu has recently developed type 400RD tool holders. The benefit of these is that they have not 1 but 2 inserts!

Available in 10 mm or 12 mm versions, **they can be fitted on all machines which use these sections.**

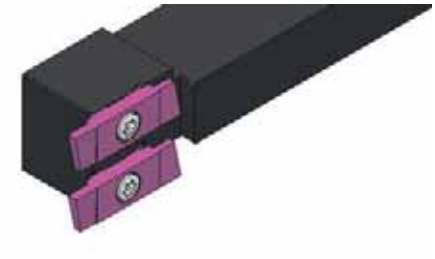


A single tool holder allows two distinct applications

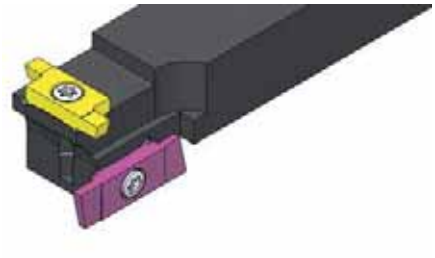


400RD holders are currently available with the following insert combinations:

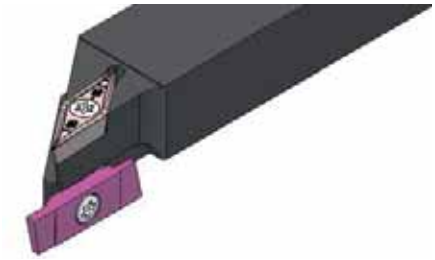
- 2 Bimu 400line inserts
  (please note that this version is also available for 16 mm sections)



- 1 Bimu 400line insert +
  1 "hook tool" type platten



- 1 Bimu 400line insert +
  1 ISO VCGT11 type insert

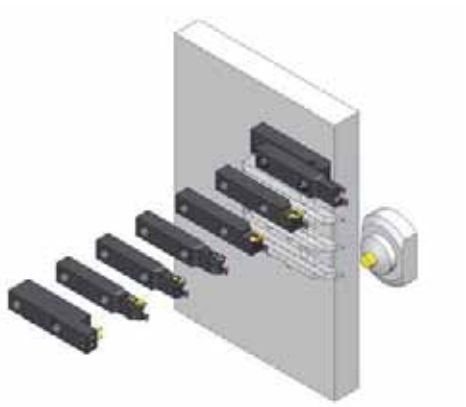


3. Dual tool holders for configuration with the "Tecko" modular tool system on Deco 10/13

The dual tool holder concept is also available on the Tecko system. In this case, the design of the tool holders is different and it brings new benefits such as rapid changeover, thanks to the "Quicklock" screws and the option of tool presetting. Detailed information on the "Tecko" system is available from www.bimu.ch/pr_tecko_e.html

There is a larger range of dual tool holders for the "Tecko" than for standard tool holders, and it includes tool combinations with the VPGT insert, ISO DC07 insert, insert centring device or borer.

Replacement of a standard Deco 10 tool holder with a Tecko dual tool holder (various tool combinations possible)



"Tecko" dual tool holders are available, amongst others, for the Deco 10 and Deco 13.

The system allows one or more standard Tornos tool holders to be replaced with "Tecko" dual tool holders, depending on whether the user wishes to double the maximum tool positions or keep some of his original tools.

Find the complete documentation for the products presented here at www.bimu.ch

Bimu
cutting tools & accessories

Rue du Quai 10
CH-2710 Tavannes
t. +41 32 482 60 50
f. +41 32 482 60 59
e. info@bimu.ch
i. www.bimu.ch

Bimu

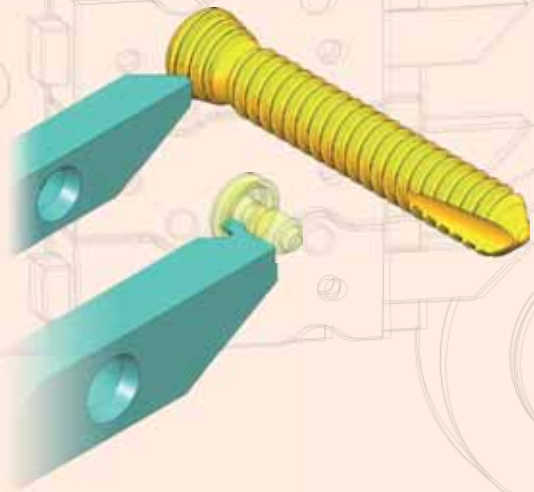
cutting tools & accessories

Swiss made

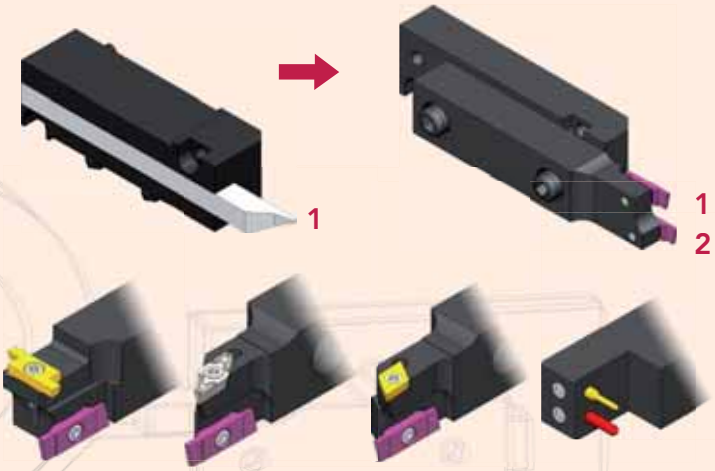
www.bimu.ch

Your tooling specialist for swiss-type automatic lathes

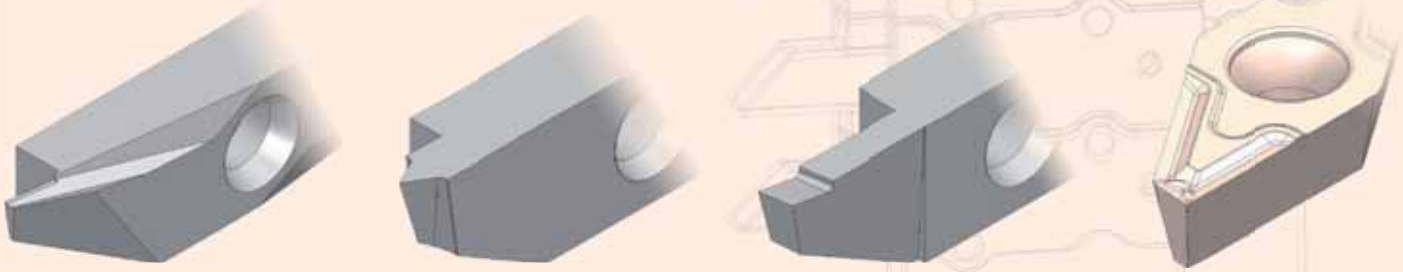
Special adaptable inserts for dental & medical applications



Tecko system : double the number of tools on your machine !



Large choice of insert's geometries



Some of our resellers worldwide

Singapore
Woh Yuan Industrial PTE Ltd.
wohyuan@singnet.com.sg

Malaysia
Woh Yuan Industrial PTE Ltd.
wohyuan@singnet.com.sg

Taiwan
Corremax International Co., Ltd.
www.corremax-taiwan.com.tw

Israel
Josef Rosenthaler Co. Ltd.
rmta@netvision.net.il

Honk Kong
Nomura Seiki International Ltd.
hknomura@netvigator.com

U.S.A.
Alouette Tool Company Co., Ltd
www.alouettetoolco.com

Thailand
Bimu Thailand
bimuthai@yahoo.com

South Korea
Jinsung Eurotec
www.bestjinsung.com

Sweden
Ehn & Land AB
www.ehnland.se

APPLITEC

SWISS TOOLING

SWISS MADE

APPLITEC MOUTIER SA
Ch. Nicolas-Junker 2
CH-2740 Moutier
Switzerland
Tel. +41 32 494 60 20
Fax +41 32 493 42 60

WWW.APPLITEC-TOOLS.COM