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THINK PARTS **THINK TORNOS**

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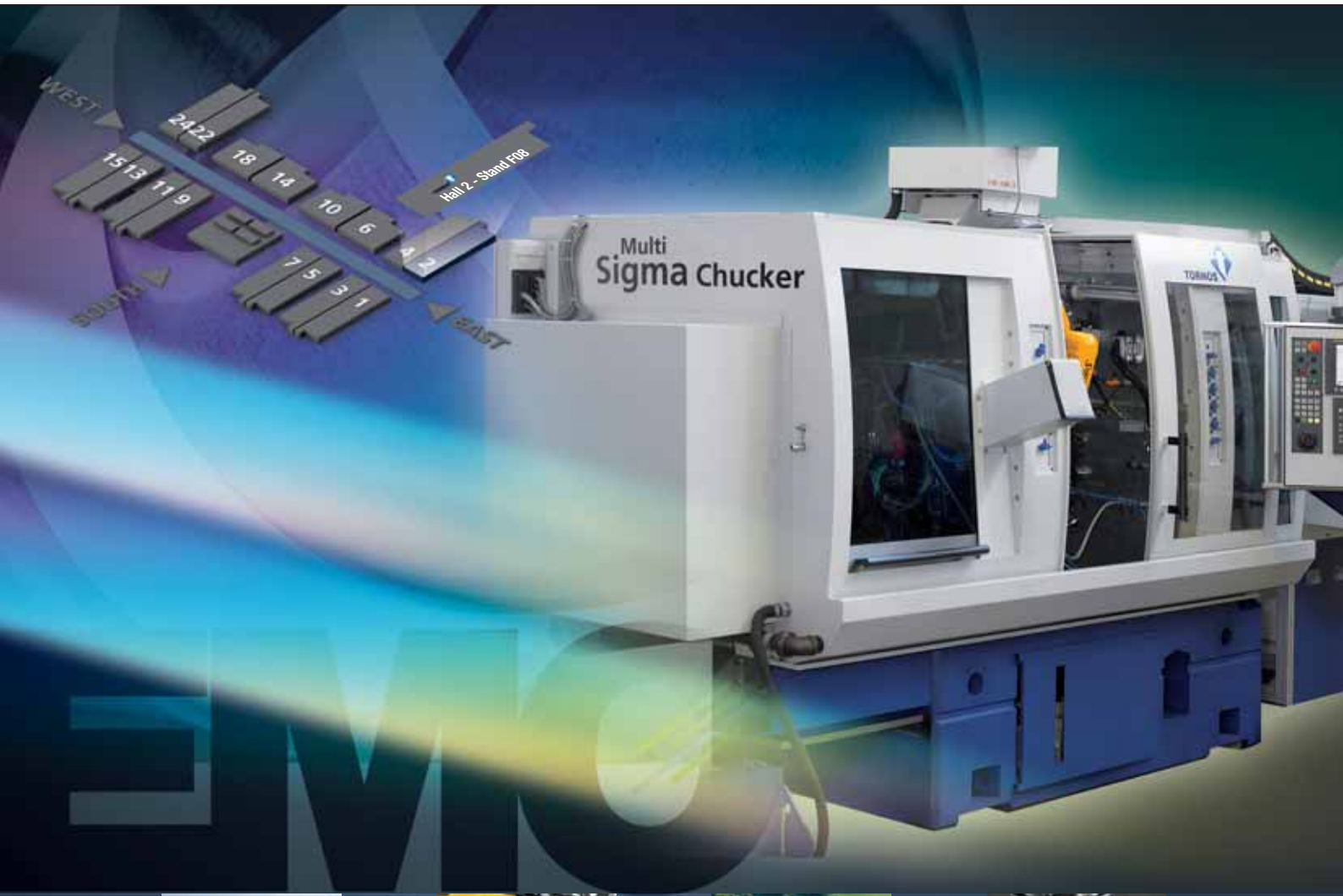

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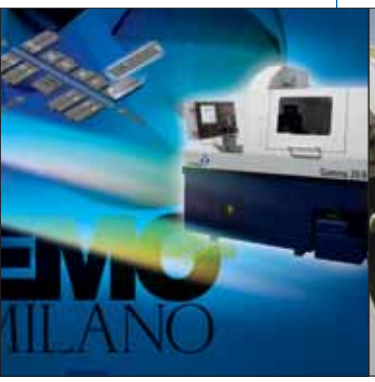

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CRISIS AND INNOVATION AT TORNOS

The current economic crisis is more brutal and longer lasting than predicted. Even if this crisis has the same background as previous crises, this one will certainly be different. It is provoking a necessary and widespread reactive *movement*. The world is again starting to question its consumer products and its methods of production. The near future will see hybrid cars, a general increase in sustainable products, the development of flexibility in all its forms, the decentralisation of IT systems, and changes in our ways of thinking. This crisis will lead to acquired positions being broken with or overturned. At the same time, it will open up numerous windows of opportunity for those who are prepared. The future belongs to the bold, today more than ever.

At Tornos, we are fully aware of this situation and are ensuring we have the means to **give us impetus,** to anticipate change, to review our culture of innovation and to act quickly by focussing our creativity on making products that can give their end users all the benefits needed to safeguard their competitive edge.

All our future products have been designed to increase productivity, cost efficiency and machining quality, all within the context of greater flexibility during start-up. We are rapidly expanding our portfolio of products so we will be able to fulfil requests of all types and meet all new production challenges in a highly specialised way.

On our "high-end" machines, we are continuing to expand the concept of "finished parts" - those requiring no secondary operation - even further. Many innovations have been released, with more coming soon. These include an increased capacity in terms of the number and types of tools, increased thermal and vibratory stability, new software - called **DecoDrive**, running on a PC integrated into the machine - specifically designed for the work and to promote rapid start-up, new ergonomic designs, reliability, working with or without a guide bush, working with grippers or chucks… and are just some of the strategic directions we are working in to develop our existing product base and to define new products.

Lastly, many **new applications** have been released, demonstrating the innovative force at Tornos. As an example, let us mention gear hobbing on the Deco 10 and Deco 13, the **Almac CUB112** machine, enabling complete machining of complication watch plates, or the new **multispindle Chucker** which allows moulded parts or billets to be machined, allowing the loss of base material for machined parts to be reduced as much as possible.

Taking another angle, we have started a move towards more straightforward machines, available at a very accessible price, which are both reliable and **simple to use,** enabling our customers to develop a competitive edge for the least complex parts.

Well aware that it would be presumptuous of us to not recognise our lack of experience in developing and manufacturing straightforward, high quality, very low cost machines, we decided to go and find the skills we needed directly at the source, in Asia. The result was the **"Delta"** single-spindle line, created from our OEM alliance with Precision Tsugami. This new line of products, under the Tornos name, provides Tsugami with an economic boost in terms of quantity. It should also be mentioned that Tsugami, in the same way, is looking after the marketing of our high-end multi-spindle products for the Asian market. New types of machine, which are extremely competitive in terms of the capacity/price ratio, will be released soon (see page 12).

So, in this time of economic crisis, Tornos has armed itself with many more ways of innovating. Our sensitivity to the needs of the market, our competitive nous and our focus on changes to what our customers currently value are at the centre of all our concerns. Far from merely sitting out the crisis, Tornos is **moving** with it, perfectly aligned with the challenges of the time.

Philippe Jacot
CTO Tornos SA

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TRUE PARTNERS!

The old Italian saying "la classe non è acqua" reminds us that "class is rarer than water" and this is just as true when talking about the distribution, sales and technical assistance for the prestigious Tornos brand, which their Italian subsidiary – Tornos Technologies Italia S.r.l. – has been carrying out for many years in a highly professional and highly skilled way. A solid contribution to the competitiveness of the Italian industry.

A new concept of service

Tornos Technologies Italia S.r.l. in Opera (Milan), a subsidiary of Tornos S.A. in Moutier (Switzerland), is a real jewel in the machine tools sector of the Italian market, especially in terms of the support provided to companies when choosing the turning solutions most suited to their needs and the technical assistance provided by its After-sales service.

The Italian market is very familiar with Tornos single-spindle and multi-spindle turning machines, from the Deco 10/13/20/26, Sigma and CNC multi-spindle series, right up to the most recent Delta range, available for almost a year and characterised by a highly favourable cost/service ratio.

Also, at the beginning of 2008, Tornos purchased the Almac company in La Chaux de Fonds, highly renowned, especially in Switzerland, for their manufacture of 3, 4 and 5-axis machining centres and its machines for producing parts designed for the watchmaking industry.

"Our subsidiary", explains Barbara Stivan, admin and HRmanager, *"is like a true Service company acting on behalf of the headquarters for the promotion and sales of machines and for assistance. We have developed a simple and flexible structure capable of responding quickly across the whole of Italy, wherever problems in the bar turning sector arise. Thanks to*

"Currently, the economy is in a very delicate condition and we really need to be close to our customers…"

the skill of our personnel, we are basically self-sufficient and capable of supporting our clientele through 360°, from initial troubleshooting right though to resolution, with one or more Tornos machines.

Our sales personnel and our technicians undergo regular training programmes at the headquarters, on new machines and on the most recent features and technological innovations. In the Swiss factory, our personnel are carefully trained by representatives from the various Product management departments who also have the role of supporting our company by looking into our customers' specific turning problems".

Walter Pasini is the sales coordinator, and his dynamism and skill are well known in the field.

"The philosophy of our company is mainly to make sure we remain constantly on hand to deal with any problems our customers may have. To do this, we ensure we are always available to our customers, giving rise to a true partnership. One of our major advantages is without doubt our technical/sales service, available to the regional sales coordinators. Thanks to them and to our agents, we are able to cover the whole of the country to fulfil our strategy. For any requirement, whether it relates to checking the feasibility of machining normal or special parts, technical problems, spare parts, or technical assistance, we can always respond in the shortest possible time and with the highest level of skill. We can study the part and determine the best machining solution including the tools required.

Barbara Stivan, operations director, Tornos Italy

For Tornos Technologies Italia, customer satisfaction is the principal aim and a true benchmark, and Walter Pasini emphasises that time and again a customer buying their first machine will go on to become a loyal customer.

"In Italy, it is quite common for workshops to have dozens of Tornos machines… Our customers know that at any point in time they can count on us to help them with both set-up and new features. We keep them regularly informed to ensure that they are able use the most technologically advanced machines to create parts of an exceedingly high quality.

As our aim is to always do more and do better, especially in terms of resolving certain problems, we are in favour of frequent technical visits by our customers to the headquarters. The aim is to foster a close relationship between the customer and the company. This is because we know this closeness can affect the products which may become their investment. We also want to increase contacts with our market through the work of the product managers in conjunction with sales support.

We have noticed that these scheduled visits, with dedicated services, are a very useful experience for our customers, who really appreciate this service".

One of the many areas of activity offered by Tornos Technologies Italia, the technical support service for programming machines, merits particular attention.

A SUCCESS STORY

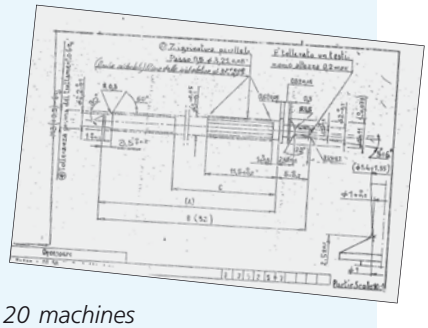
Company: **Leghe Leggere Lavorate S.r.l.**
Via Lucania 23/25- 20090 Buccinasco (MI)
Tél. 02.45712115- Fax 02.4880012
info@legheleggere.com

Ivo Pizzamiglio, president of Leghe Leggere Lavorate, tells us with satisfaction: "after having reached a very high technological level, thanks to Tornos machines and the Deco range of products in particular, we have had to face a new challenge: replacing LLL's first workshop (because of its age), which means removing all its cam machines as, in terms of the accuracy and the quality required for the parts that we make, they can no longer satisfy our customer's needs. We have therefore carried out an in-depth study of the market through contacts with potential "low-cost" turning machine suppliers and, once again, we have chosen Tornos with its Delta series of machines.

In addition to the technical specifications and the excellent cost/service ratio of the machine, our choice was also determined by the close working relationship with Tornos Technologies Italia that has been developed over the years, a relationship which has allowed us both to grow, extending largely beyond the conventional supplier/customer relationship.

I am completely satisfied and my satisfaction can be summarised as follows:

1. **"Colonnina" part, material OT58, manufactured on a Tornos Type R10 cam machine: machining time for the part, 15 secs. Output/day 70 %.**
2. **Same part manufactured on the Delta 12/5 III: machining time for the part, 9 secs. Output/day 95 %.**



Today, we are very happy that we chose Tornos as much as a partner as for their low-cost machines, as the new series is extremely reliable and offers high productivity, and is also very simple to use. We are the happy owners of 2 Delta 12 machines and are currently considering adding the larger Delta 20 machines to our bank of machines".

Walter Pasini, sales support manager

"The philosophy of our company is mainly to make sure we remain constantly on hand to deal with any problems our customers may have."

Offering a technical "hotline", this service is always fast and efficient. This also applies to the after-sales technical assistance. Two "hot line" operators and four technicians, two specialising in single-spindle and two in multi-spindle machines are always available.

Tornos Technologies Italia is therefore a solid, reliable presence in the Italian bar turning industry. Thanks to its expertise, which is continuously being developed, the company is able to reinforce its presence in the fields of application of different sectors to offer customised solutions which fulfil the specific requirements of these sectors. The experience acquired encompasses a range of sectors, including automotive, electronics, silver work, machining of precious metals, parts for weaponry, eyewear, hydraulics, pneumatics, plumbing fixtures, etc. Not forgetting, as Mr. Pasini points out, that Tornos has been the leader for 20 years in the manufacture of "spare parts" for the human body: bone screws, protheses, implants and dental instruments, etc.

"Currently," added Barbara Stivan, *"the economy is in a very delicate condition and we really need to be close to our customers to provide support, even for small, or very small, requests. We are convinced that our strength, beyond the quality of our machines, is summed up by our slogan "The customer will never be alone"".*

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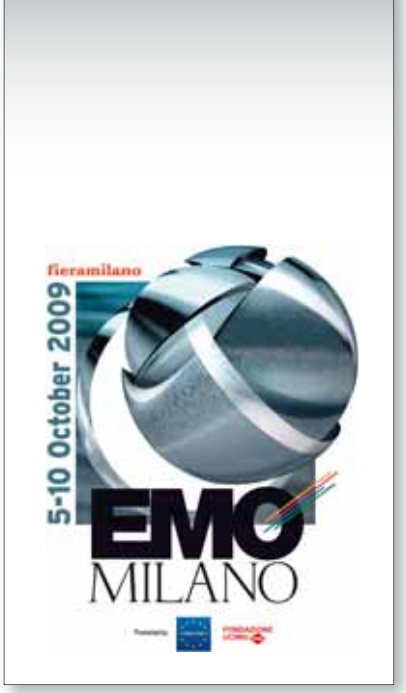


THE EMO IS NOT TO BE MISSED

New machines, new agreement with Tsugami and special presentations of dedicated applications are all on the menu for visitors to the Tornos stand at this year's EMO in Milan. The Swiss manufacturer has made the most of the quiet global situation to refine its strategy, and is displaying the benefits of this to its visitors. More than ever, the competitiveness of companies depends on the ability to offer innovative solutions to their customers. For this reason, a visit to this EMO - which may well be the first to show the faint signs of an economic upturn - and to the Tornos stand, is a must.

Continuing the strategy

For several years, Tornos has been making a name for itself in very diverse sectors, namely the medical, automotive, electronics and micromechanics and watchmaking industries. When asked about the relevance of this approach, which more and more companies are adopting, Willi Nef, Sales and Marketing Director told us: *"There is no doubt that this strategy is the right one; it has enabled us to put to use specific expertise that we have acquired over time. Success in one domain is fed by that of others. For example, our long experience in watchmaking has allowed us to offer tried and tested solutions for manufacturing complex and precise small parts for the medical industry. Along these same lines, the production and quality constraints for the automotive market have given us more rigour in other domains".*

New Gamma machine…

Tornos is unveiling a new family of machines under the name Gamma. Positioned between the Deco machines, designed for manufacturing complex parts, and Delta machines, which have been highly successful in manufacturing straightforward to moderately complex parts, these new turning machines complete the manufacturer's range for creating moderately complex parts. Questioned as to the difficulty experienced by the customer in knowing how to choose between a Delta 20/5, a Sigma 20, a Gamma 20 or even a Deco 20e or a, Willi Nef explains: *"The most important thing is not the number of machines which seem to be crowding out the mid-range parts market sector, but rather the possibility for the customer of finding a machine which precisely fulfils his requirements. Now more than ever, Tornos is offering platforms of products ensuring our customers can always find a machine which corresponds exactly to their requirements!"*.The 6-axis version (Gamma 20/6) of this new machine will be on display, with a 5-axis version (Gamma 20/5) also available.

…and the new MultiAlpha Chucker

As a manufacturer of *Chucker* solutions for more than 50 years, Tornos has always provided loading systems for forged or formed parts. Very often the disadvantage of this type of system is that the parts must be custom fed. With the new *Chucker*, which has a robot located within the machine itself, everything is more flexible. The machine capacities are also increased as the new hydraulic chucks can take parts up to 55 mm in diameter (see the article on page 15).

TORNOS MACHINES ON STAND F08/HALL 2

EMO 5-10 OCTOBER 2009 Hall 2 Stand F08

To bolster our position as a specialist in various domains, Tornos is showing the following solutions at the EMO:

MEDICAL

Deco 20 a – New equipment

The machine shown at the EMO is a means of production which is proven in the medical domain. Equipped for machining hip screws, the Deco 20 showcased several innovative devices, such as the 3-jaw mandrel used in the counter spindle which enables 'long stroke' clamping for taking and clamping workpieces on a shoulder section or on a smaller diameter. Another remarkable component is the turning spindle for tip drilling using high pressure (up to 210 bar) through the tool.

Almac FB 1005 – Special start-up

3 to 6-axis CNC horizontal bar milling machine. This machine allows very complex parts to be created with the greatest of ease. During the EMO, visitors can discover how to machine highly complex dental abutments.

ELECTRONICS

Delta 20/5 - Special start-up

The most sophisticated machine in the Delta range, this is a highly tailored response to very specific market requirements. Customers enjoy all the benefits of a straightforward and reliable machine for trouble-free production of parts which don't require highly complex operations, at the best price/performance ratio. The option of working with or without a guide bush is a quick way of offering users a wider range of benefits (see the article on page 19).

MICROMECHANICS

Deco 10e - New equipment and tools

The "e" machines are 'more straightforward', with no compromise on quality or precision: in actual fact these are simply turning machines fitted with one less independent tool system than Deco "a" machines. The machine on display benefits from a new tool and equipment design which increases the number of available fixed tools by 50 %. There is also the option of fitting three rotating tools instead of two on platten two. The machining possibilities are greatly increased.

Almac CU 1007 – Special start-up

A mini machining centre with 3 to 5 axes, fitted with a loading and unloading robot, the machine shown is for machining ultra-precise micromecanical parts.

Roland Gutknecht, CEO of Almac told us: *"The fact that we can rely on the Tornos group's sales network has enabled us to expand our communication with the world as a whole and success is forthcoming. For customers, it is really an excellent opportunity to access a complete range of products".*

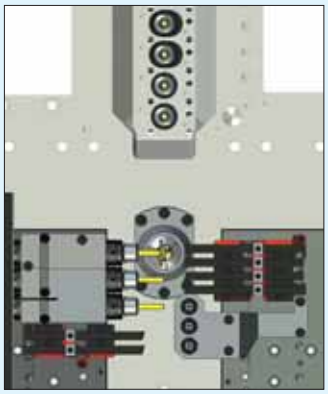
Complete integration of Almac products

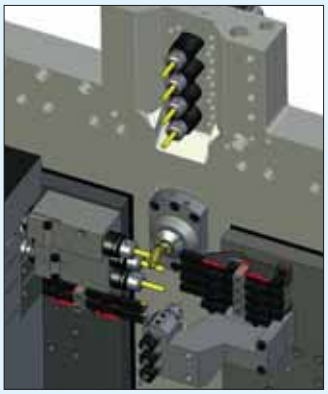
All readers of decomagazine know Almac products. New since the EMO, these are being sold under the Tornos brand throughout the world, with the models, of course, still being known by the Almac name, followed by their number. This marks the end of the process to integrate Almac into the Tornos group. Roland Gutknecht, CEO of Almac told us: *"We are working closely with Tornos and we are benefiting from the group's industrial power, which is a major asset for the production of our machines. In the same way, the fact that we can rely on the Tornos group's sales network has enabled us to expand our communication with the world as a whole and success is forthcoming. For customers, it is really an excellent opportunity to access a complete range of products".*

AUTOMOTIVE

MultiSigma Chucker – New product

The new Chucker device on display at the EMO includes a robot fitted at the heart of the machine and may be loaded with different types of parts up to 55 mm in diameter. Mr. Martoccia, the product manager, told us: *"The chucker solution enables continuous production of billets with all the advantages of bar-fed machines. Furthermore, these turning machines have already proved their worth in terms of production. For our customers, it is a guarantee that they have the ultimate solution for machining billets"* (See the article on page 15).





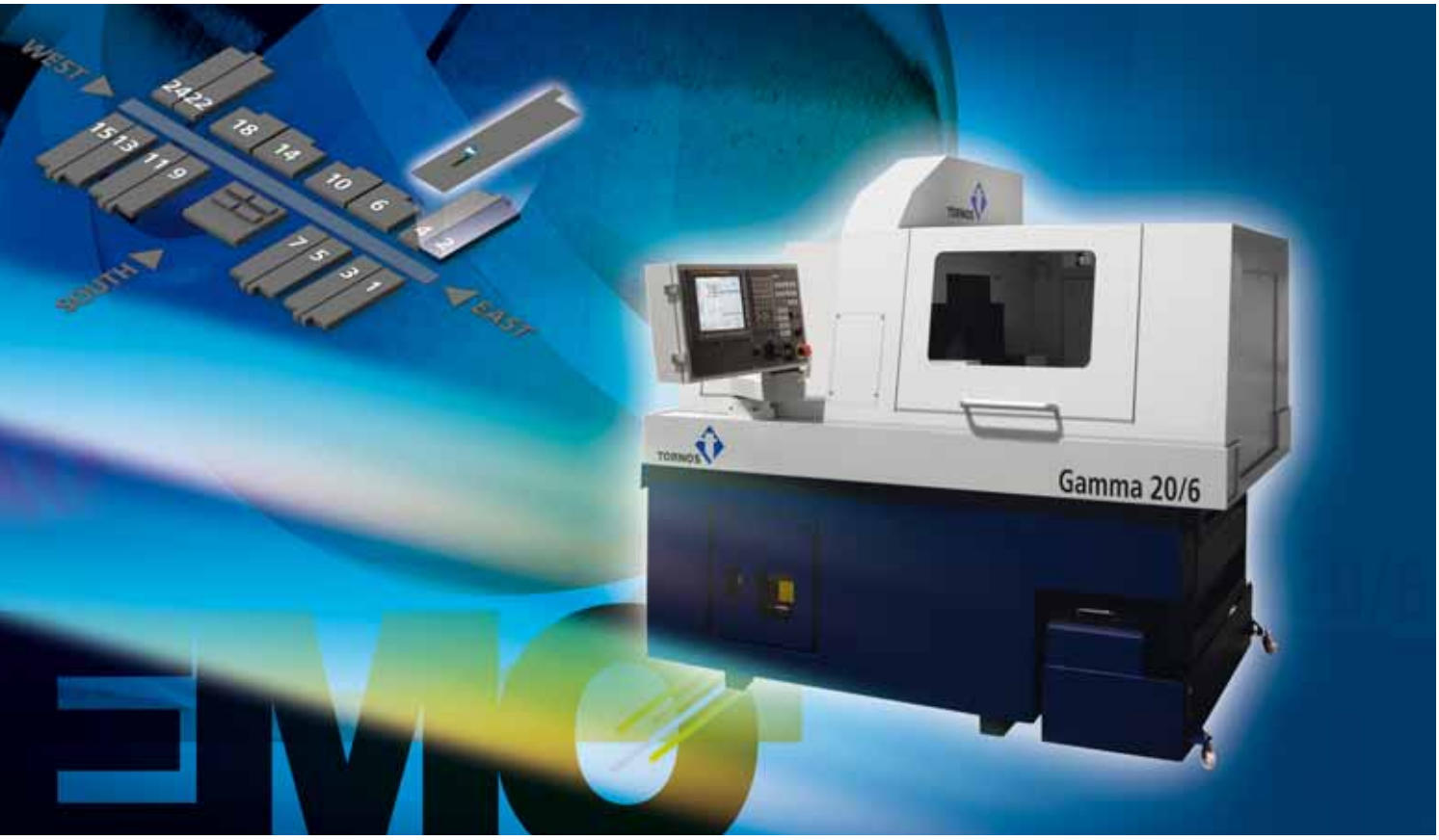
With a marked increase in the number of tools which can be mounted simultaneously, the Deco "e" range offers a much greater machining capacity. The image shows the Deco 10e machine on display at the EMO.

Gamma 20/6 - New product

The Gamma line will be made up of two models, a 5-axis and a 6-axis version. The 5-axis model uses the tried and tested kinematics which are behind the success of the Delta range, including a platten resting on 2 axes during operation and a fixed counter operation block. Gamma differs from Delta in terms of its greater power and strokes and its increased number of fixed and rotating tools, as well as the option of adding special equipment. The 6-axis version, which uses an additional Y axis on the counter operation block, allows complex machining to also be carried out on the rear face of the part. As with the Delta line, a kit without a guide bush will be available on Gamma machines. In terms of tooling, the machine will allow a high level of flexibility, both for driven tools and specific tools. Equipment which allows high added-value operations to be carried out will be available on the Gamma range, notably to include thread-whirling, polygon operation and even inclined milling.

FOR ALL DOMAINS

New software platform - New products



New partnership with Tsugami

Since the EMO in Milan, Tornos has become the exclusive seller of Tsugami products on the Italian, Spanish and Portuguese markets. To underline this new deal which will radically change the face of the markets in Southern Europe, the two manufacturers' stands will be side by side and specialists will be there to show visitors the entire range of products on sale. Mr. Nef concludes: *"The Tornos and Almac range already provides our customers with a lot of potential; now, thanks to this agreement with Tsugami, we are offering them even more ways of fulfilling their requirements".*

Off to the EMO? Its a must…

A question we have heard a lot this year concerns attendance at the EMO by the exhibitors. Factors include the difficult global situation, the EMO at Milan being traditionally quieter than Hanover and even the withdrawal of some manufacturers. *"At Tornos"* Willi Nef told us, *"this question wasn't even asked. The EMO is an important opportunity to introduce ourselves to customers and our potential customers and it is indispensable for us to do so. This year, our attendance is a special event as never before in Tornos' history have we announced and introduced so many new products onto the market. We are feeling confident, and whether this EMO is at the start of the economic upturn or not, we will be there for anything the visitors need".*

The meeting is set.

Tornos: Stand F08, Hall 2

ACCESSING NEW MARKETS…

This year's EMO Milan trade show will see Tornos preview its new billet loading system for multi-spindle turning machines: the 2009 version "chucker" system. This solution, which enables forged or formed workpieces to be machined, will considerably increase the range of workpieces that can be produced on Tornos multi-spindle machines. Interview with Mr. Martoccia, product manager.

A growing trend

In some cases, the use of a chucker solution is the most suitable method for machining workpieces. The considerable rise in the cost of materials has made it imperative to reduce the amount of material required to a minimum, by any means necessary. This is particularly relevant to machining using billets. The reduction in floor space requirements is also a big plus for users of the chucker concept.

This concept offers total flexibility, with the option to equip the same machine with both loading systems and to switch from one (bars) to the other (billets) in a few days.

A short history lesson…

Billet feeding systems have always been a part of the Swiss manufacturer's range. Since as far back as the 1960s, the SAS-16 and BS-20 machines have been available in a chucker version. The workpiece feeding device is very often a chute through which the workpiece is transferred to the spindle (in position 1).

At EMO 2007, Tornos unveiled a similar device for the MultiAlpha. This included a dual feed for machining two workpieces per cycle.

The disadvantage of this type of solution is that it requires an entire device corresponding exactly to the workpiece to be fed. Depending on the size of the series to be produced, this can slow the process down.

Flexibility of the chucker system

With its new system, Tornos has popularised the chucker solution through the use of a robotic feeding system located inside the machine itself. The robot is able to load various types of workpiece. Another innovation designed to increase flexibility is

the hydraulic chucks, which are capable of holding workpieces with a diameter of up to 55 mm. The use of a chuck gripping system reduces the quality requirements in terms of diameter and surface finish of the billets, aligning them with the quality standard of the billets themselves

Mr. Martoccia explained: *"Since the last EMO, around 15% of the MultiAlpha and MultiSigma machines we have sold have been chucker type machines. Several manufacturers who use bar-fed multi-spindle machines have added the solution to their machine base"*.

Partnership to bolster success

The machine-tools manufacturer has been working together with specialist partners highly experienced in managing the contingencies associated with automatic loading, one workpiece at a time. In this way, it is able to provide solutions suited to customer requirements and in perfect harmony with Tornos turning machines. The robot feeds the turning machine with raw workpieces, and the finished workpieces are recovered and palletised as on standard machines, using either a linear manipulator or a robot coupled with a palletiser integrated in the machine, depending on the customer's needs. This solution is also gaining popularity throughout Europe. The benefit of palletisation is that this operation reduces the number of different handling procedures for each workpiece, whether it be for cleaning and dispatching or even for other types of operations such as heat treatments, for example. This reduction in the need for human intervention cuts the transit time, thus lessening the risk of workpiece damage and the various associated costs.

This is another area in which customers can benefit from the vast experience offered by Tornos and its partners.

Chucker: nothing but advantages

A turning machine designed for machining billets loses none of its original capability to subsequently operate using bars. If the process changes, for example, the loader can be used. The machine's kinematics is unaltered; only the first position is mobilised by the robotic loading system. It is therefore possible to add a bar feeder without modifying the turning machine.

Mr. Martoccia continued: *"With the chucker system, our customers can not only machine larger diameters, but also tubes, as an internal grip option is also available. But the main reason to purchase this solution today is the fact that it is possible to machine workpieces in materials, and with shapes and diameters, that are not available in bar form"*.

Greater productivity…

Nowadays, the quality of forged or drop forged slugs is ideal for turning. As the slug is premade, the machining volume is reduced, thus cutting the number of processing points required on the machine. For workpieces requiring very little processing, the chucker solution's robot also enables two workpieces to be machined per cycle.

Tornos MultiAlpha and MultiSigma turning machines are equipped with powered spindles, with each machining station having an independent spindle speed and position, thanks to its integrated motor. They are therefore able to perform operations at the

ideal speed for each spindle, and to stop the workpiece in each position to perform precision milling and drilling operations, for example.

The concept is also available on the MultiAlpha. This machine, with its 5 counter-operating tools, enables complex workpieces to be machined on both sides. Tornos multi-spindle turning machines are now capable of producing workpieces which, until recently, would only have been possible using machining centres.

With the increase in machinable diameters, the ability to adapt each cutting speed is a real advantage. Its independent speeds help bar turners to achieve more effective and optimised production processes.

… and economy.

As illustrated above, a turning machine equipped with a chucker system is still a highly productive machine which benefits from the vast experience offered by the manufacturer of multi-spindle solutions. Enhanced productivity, flexibility, an increase in the diameter of machinable workpieces and reduced floor space requirements are undeniable economic advantages. The service life of the chucker is guaranteed by the large stock of available parts. A variety of palletisation options is available for standard pallet dimensions, making it unnecessary to carry out numerous alterations to suit each individual customer.

Mr. Martoccia concludes: *"The chucker solution enables continuous production of billets with all the advantages of bar-fed machines. Furthermore, these turning machines have already proved their worth in terms of production. For our customers, it is a guarantee that they have the ultimate solution for machining billets".*

If you would like more information please contact Mr. Martoccia at:
martoccia.r@tornos.com
Tel. +41 32 494 44 44

THE NEW CHUCKER SYSTEM - A FEW FACTS

Robotisation system:	Staubli
Size:	no change to the machine's size - the robot is inside.
Gripping system:	hydraulic chucks
Max. grip diameter:	55 mm
Max. workpiece length:	up to 130 mm. Depending on the diameter, confirmation from the manufacturer's design office (weight, shape, etc.) may be required.
Available:	beginning of 2010
Average delivery lead time:	8 months
Programming:	via integrated PC. The robotisation system is controlled by TB-Deco.

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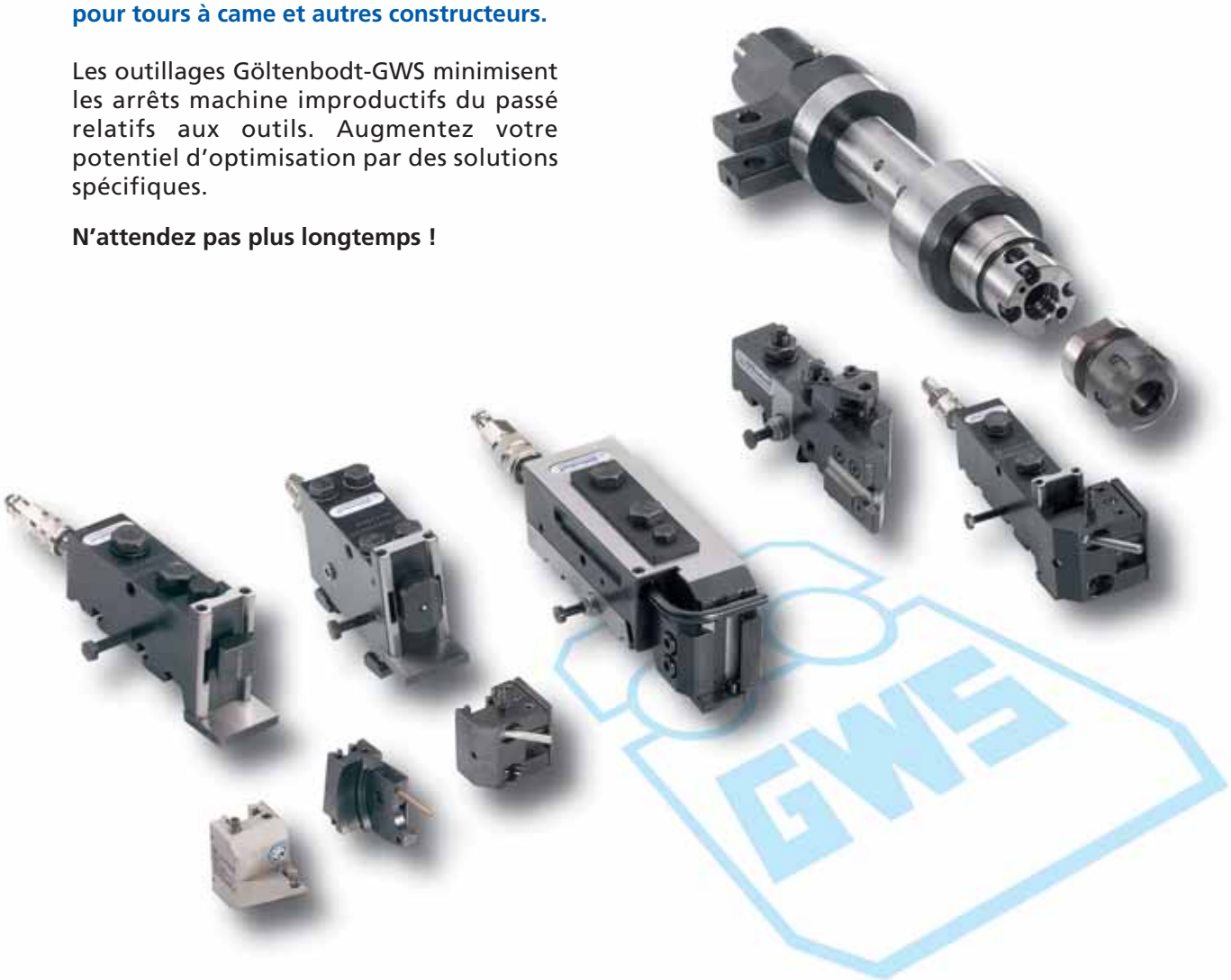

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DELTA : WORKING WITHOUT A GUIDE BUSH AND WITH EVEN MORE FREEDOM

To get the measure of the specifications for the Delta line, we met with Serge Villard, product manager at Tornos. This range of machines is dedicated to creating straightforward to moderately complex parts with more than one string to their bow. Let's discover…

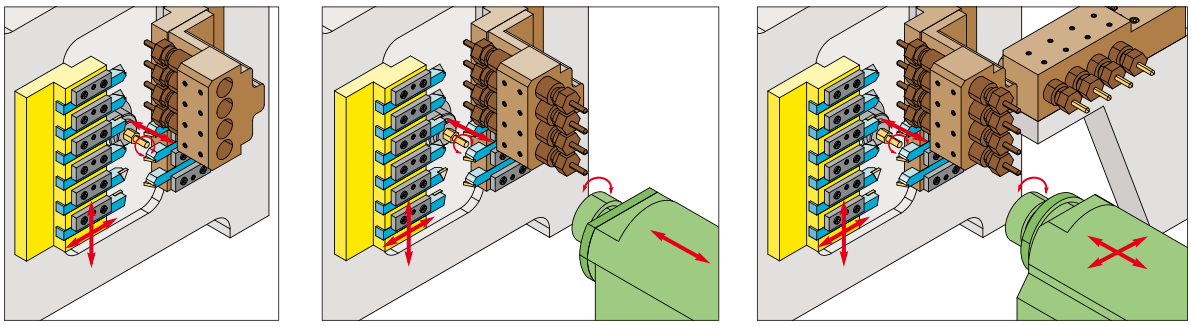
An encouraging response from the market

According to Mr. Villard, despite the difficult economic climate, the response from the market to this new range of machines has been very promising. European markets have purchased a good half of the machines sold up until now. The rest of the sales were split between the other two major regions, the USA and Asia. It has been the models with 5 linear axes that have met with the most success in Europe. The other models have also found their place in other markets. The results are certainly below the forecasts. However, this new range is very attractive because of its specifications and the advantages it offers its users.

Let's have a look at a few details :

With or without guide bush

The first characteristic that Mr. Villard wanted to highlight was the option of transforming a conventional sliding headstock machine, able to use different types of guide bushes, into a turning machine that works without a guide bush, using the fixed headstock principle. Mr. Villard told us : *"the option of adapting the turning machine to work under the best machining conditions, based on the geometry of the workpieces, the type of material or even the quality of the bars is a real benefit for our customers. Furthermore, this change can be carried out in just 30 minutes. All the models in the Delta line offer this option".*



3 axes 4 axes 5 axes

This is a real advantage that is being increasingly recognised by manufacturers of bar turned parts. The option of working without a guide bush is also offered by other manufacturers, but very often a choice must be made when purchasing the turning machine of whether or not a guide bush is required, which obviously makes the turning machine less universal.

Why this technique ?

What are the reasons in favour of working with this method ? Mr. Villard told us : *"There are several major advantages of working without a guide bush. Firstly, the dropping or loss of material is approximately 2/3 shorter. Depending on the price of the material, this may constitute a significant economic factor. Secondly, the bar of material does not need to be of a very high dimensional tolerance such as h9 or even h8. (sometimes requiring a straightening operation to ensure there is consistency in the diameter for perfect guiding into the guide bush). Working without a guide bush enables these constraints to be overcome and as a consequence, generates a small saving."*

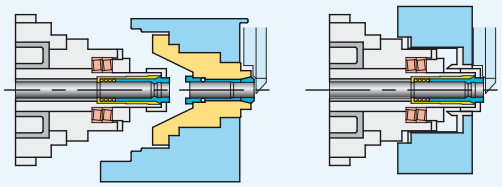
"Working without a guide bush in some cases allows geometric tolerances such as circularity to be guaranteed, which is difficult to obtain with a conventional guide bush, especially turning guide bushes. Finally, for all these short or delicate parts for which the guide bush is not of added value, the fact that an additional component does not have to be fitted and adjusted reduces the set-up times and helps increase the productivity of the turning machine, which is the aim of every manufacturer of bar turned parts."

Flexibility

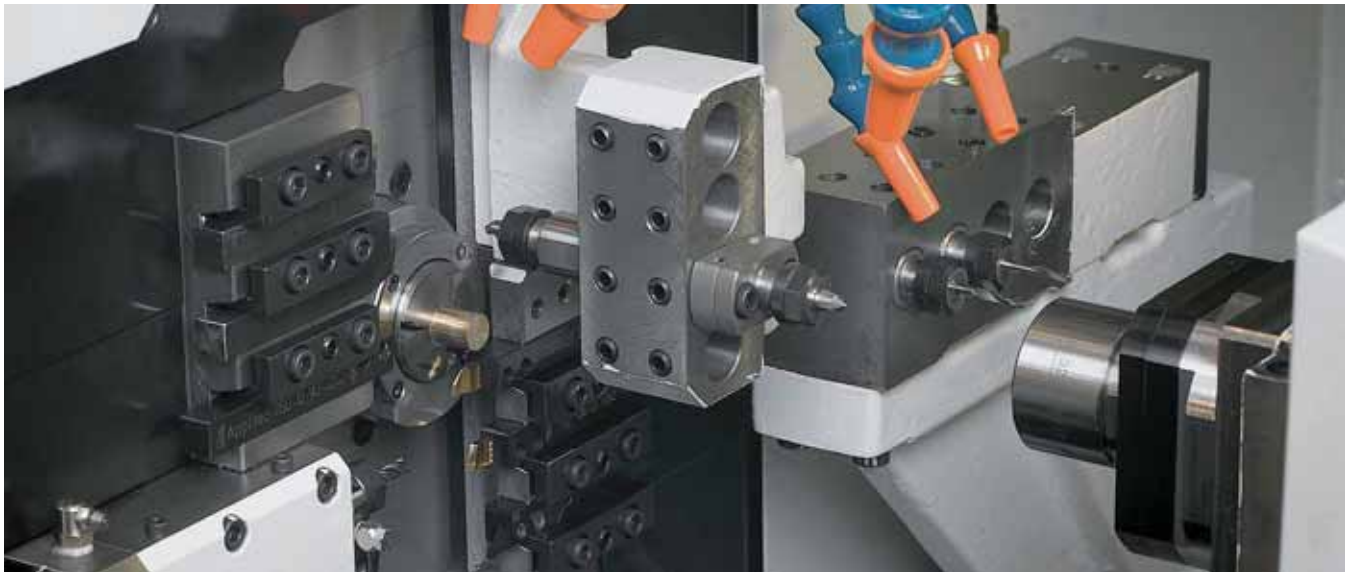
Does this provide the solution to all the material and precision issues ? Not really, as this system has limits. This is why it is useful to be able to change and return to conventional machining (collet & guide bush). In principle, parts machined in this way should not be of a length greater than 3 X the diameter of the bar.

What is the difference between these guide bushes ?

As opposed to the standard turning guide bush, driven by the spindle via a yoke bushing and limited to 8,000 rpm, the ***motor guide bush,*** or guide bush with an integrated motor as its name suggests, is no longer connected to the spindle, which allows it to turn at a significantly higher speed of up to 12,000 rpm. It also allows parts of up to 170 mm long to be machined, which makes this machine amongst the best performers in its category. With this motor guide bush, switching from working "with guide bush" to "without guide bush" and vice versa is even easier. The conventional ***fixed guide bush*** is designed more for carrying out micromechanical machining operations requiring the utmost precision (for example : watchmaking), working with non-ferrous materials or even bar turning steel.



Guide bush type Guide-bushless type



Nowadays, we purchase a machine to fulfil a specific machining requirement, without thinking too much about the parts that we may be producing in a year or two. The Delta family is made up of several models in the two capacities : 12 and 20 mm. They are available in 3, 4 or 5 axes. These machines are also offered as different packages made up of more or less sophisticated equipment, allowing the best price-capability ratio to be offered for every requirement...

Mr. Villard added : *"It is obviously quite a theoretical limit, which also depends on the type of material and the diameter of the bar. This ratio is certainly lower if we are talking about micromechanical parts machined from very small bars that may cause bending. In the end, it is the experience and the skill of the each bar-turner that will determine this choice"*. And with Delta, Tornos is facilitating this choice !

Ease of access

As for the Sigma and Micro Tornos lines, there is the option of controlling the Delta line using the conventional ISO programming language with which the operators of turning machines, milling machines and other machines are familiar. While the TB-Deco system developed by Tornos, represents real added value when programming DECO multi-axis turning machines with four tool systems, the ISO system lends itself very well to programming a CNC lathe with two channels. Mr. Villard added that with Delta, the aim was to ensure the turning machine is accessible to all users with basic programming knowledge and who are sometimes little inclined to integrate another programming method. *"We think we have succeeded, as our technicians have reported back to us that our customers familiarised themselves with the control system (Fanuc Oi-TD loaded with ISO programming software adapted by Tornos) very quickly"*. Mr. Villard stated that even more programming comfort will be provided soon with the development of several macros that users of Tornos machines are very familiar with. We will take another look at this subject in a future issue.

Freedom of choice in a very large range…

Nowadays, we purchase a machine to fulfil a specific machining requirement, without thinking too much about the parts that we may be producing in a year or two. The Delta family is made up of several models in the two capacities : 12 and 20 mm. They are available in 3, 4 or 5 axes. These machines are also offered as different packages made up of more or less sophisticated equipment, allowing the best price-capability ratio to be offered for every requirement…

… completed by a wide range of options

Even though the machines are straightforward and sold as part of packs, the user may still complete their machine with a number of options and accessories the user can then adapt. *"Even for the guide bush, there is an option to choose between a turning guide bush driven by the spindle, the motor guide bush or the fixed guide bush. Soon, we will add to our list of options a guide bush holder that will allow Habegger needle guide bushes to be fitted, while of course the option of working without a guide bush already exists,"* said Mr. Villard.

To return to the range of peripherals and accessories that Tornos offers with its Delta turning machines, we also find the type SBF 320 automatic bar loader. This is an oil bath bar loader with bars stored on a

SERGE VILLARD : QUICK INTERVIEW

decomagazine : Despite their relatively straightforward machine positioning, Delta machines seem very well equipped. How much of it comes with the basic machines ?

Serge Villard : If you are speaking of the equipment that makes up the basic packs, it obviously depends on whether the customer has selected type I, II or III. Type I is recommended for producing turned and pierced parts that do not require the spindle to be stopped. Type II also allows transversal operations to be carried out with the bar, using a device with 3 transversal turning spindles. Type III is very popular and allows the same options as type II, but with additional comfort when using the machine. It is equipped as standard with the motor guide bush (5-axis machine only), with a high pressure pump with four outputs controlled by function M which allows optimum spraying of the tool stations during main operation and during secondary operation. It is also equipped as standard with a pneumatic ejector with cleaning of the counter spindle collet with oil. A conveyor belt for parts will complete this equipment.

It must also be noted that on type III models, we offer the C axis on the main spindle while on other models ; the spindle is equipped with a stop device that can be positioned by degree (360 positions). Our stockists will be delighted to explain the features that distinguish all these machine variants to future users of Delta turning machines.

dm : What about performance ?

Serge Villard : The spindles play a key role in terms of the performance of the turning machine. These machines are all equipped with spindles and counter spindles with an integrated motor, or motor-spindle. These develop power in relation to the turning machine's capacities, allowing a rotation speed of up to 12,000 rpm without constraints, with the use of the motor guide bush. This technology offers other advantages : less noise and also less maintenance, thanks to the removal of the drive belts. The spindles are cooled by a liquid coming from an independent circuit, which allows them to be maintained at a relatively low temperature that does not affect the thermodynamics or the machine's precision.

dm : You are talking about precision, but other elements are required to ensure it… ?

Serve Villard : Yes, the precision of a machine depends on several factors that we won't be going into detail about here. What is important for the user is having a turning machine that rapidly stabilises in temperature (heating period) and that then produces parts subject to minimal variations in dimensions, so as to not always have to intervene to change the tool correctors. In addition we have been able to note that these turning machines perform very well both in terms of thermodynamics and of the repetition of the movement of the axes.

On the other hand, the main frame made up of the base and the spindle seat, and the vertical frame are well dimensioned. They provide good stability to the assembly and this eliminates micro-vibrations and allows the best surface conditions to be guaranteed on the parts and increases the service life of the tools.






tilted section allowing efficient loading of all types of bars from 3 to 20 mm. There is a belt chip conveyor that allows the turning machine to operate for longer with the oil mist recovery device, which is perfectly integrated into the turning machine. Other additional devices and accessories increase the machining options, namely kits that enable working with profiled bars (either with or without guide bush) or even the device for conveying parts longer than 75 mm. With this system, parts are removed from the machining area through the counter spindle in series. Parts of a length up to 300 mm can also be used. It must be noted that the standard system for removing parts up to 80 mm allows the parts to be unloaded at the front of the counter spindle, but also at the guide bush, for example in the case of cutting made without using the counter spindle. Mr. Villard added: *"Your usual Tornos stockist can give you information on these options, so do not hesitate to contact them".*

Freedom to start using

Users have been quite categorical; the machine has excellent ergonomics. The area provided in the working zone is pleasant and allows good access for adjusting the tools. Returning to the ergonomics, the control is placed in the centre of the machine and therefore allows the operator easy access whilst ensuring a good view of the machining area. This is an undeniable advantage when adjusting the turning machine.

Freedom to produce

Delta machines are currently being sold throughout the entire world, for domains as diverse as sub-contracting, the medical, watchmaking and electronics industries and even aeronautics. As far as types of material are concerned, these are obviously very varied: from non-ferrous metals to stiffer stainless steels, and including more exotic materials such as plastics, nylon and of course titanium, largely for the medical industry.

Mr. Villard concludes: *"The addition of Delta machines to the Tornos product line has allowed us to offer an efficient solution to our customers who are looking for straightforward machines, which are highly economically attractive and which allow certain parts to be produced at more competitive prices. These turning machines are the perfect complement to the Tornos range which has so far been oriented more towards multi-axis machines, with very sophisticated equipment for manufacturing high-tech parts or very high precision machines for the requirements of micromechanics".* He added that with Delta, other sectors of the market will open up to Tornos: *"It's a whole new world we are stepping into".*

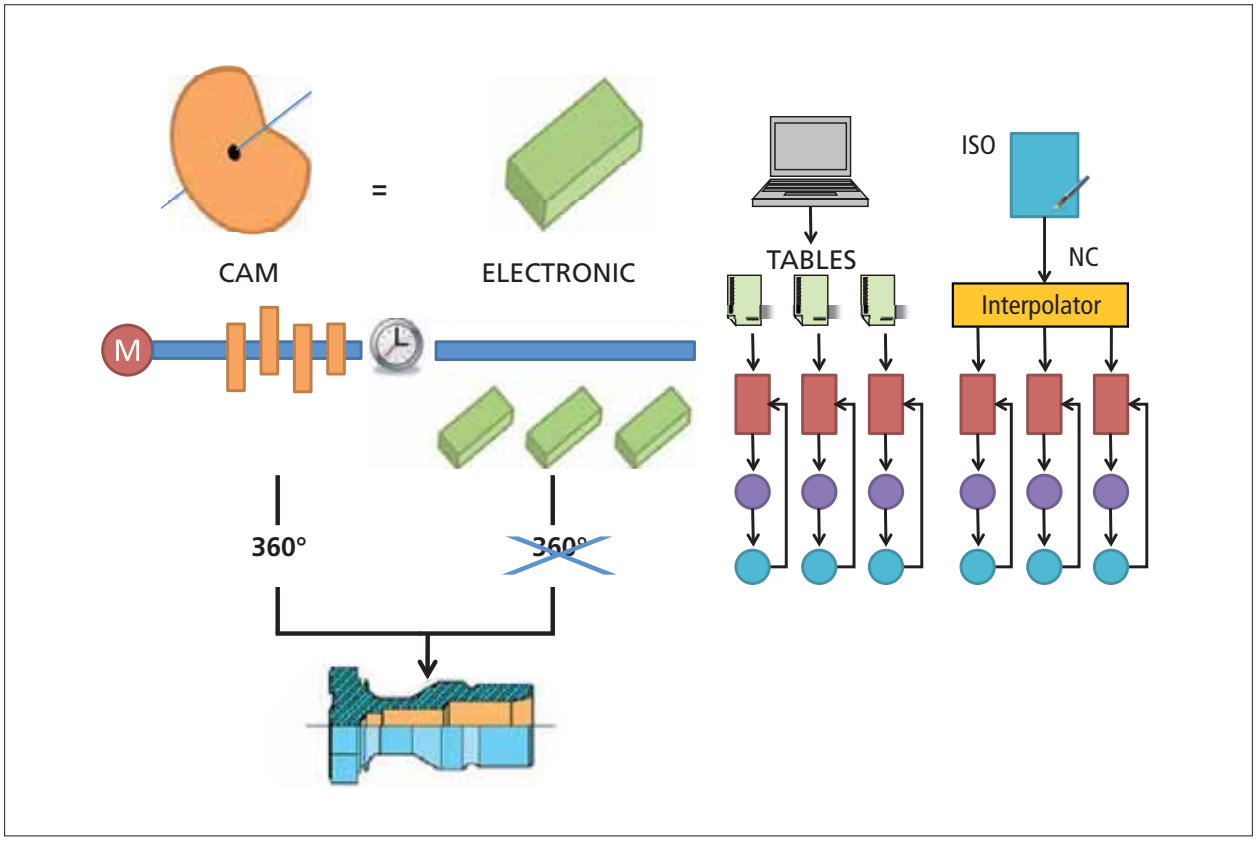
If you wish to know more about Delta, please do not hesitate to contact Serge Villard via the following methods:

Tel. +41 32 494 44 44
Fax +41 32 494 49 07
villard.s@tornos.com

You can also download the catalogue from the Tornos website *http://www.tornos.com/dnld/prd-pdf/tornos-delta-12-20-uk.pdf*

TB-DECO, TECHNOLOGY AHEAD OF ITS TIME!

In 1996, when its new line of Deco products was launched, Tornos offered bar turning companies the opportunity to switch to a computerised solution and to programme their machines using dedicated software: TB-Deco. It may seem funny today, but at the time it was common for customers to be buying their very first computer in order to "switch to Deco". It was an incredible leap forward, which opened the door to a whole host of new opportunities. Back then, TB-Deco documents made much of energy optimisation, while today, almost 15 years later, everybody's talking about "motion control". So what's new?



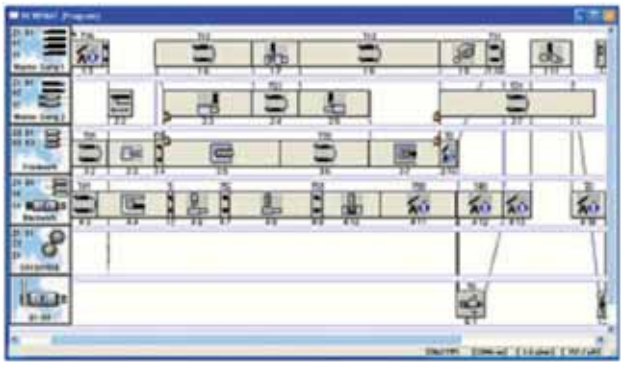
A rational man-machine interface, TB-Deco enables all types of workpiece to be programmed easily.

Operation:

TB-Deco is a programming assistance system which generates tables to control the paths of each axis and spindle, firmly based on the operation of a cam-type machine. To enable this, it is equipped with a powerful computer with an integrated interpolator and a machine simulator.

The software enables the operator to visually position the operations on a timeline, and to generate a more efficient code for the CNC. It works in the same way as the editing software used by amateur filmmakers, and makes it very easy to position operations in the desired location. Since tools already exist in their database with geometric details, the desired movements just need to be indicated using the ISO code.

For dedicated followers of CAD/CAM, TB-Deco is compatible with all the main solutions currently on



The copy and paste functions apply to the operations, but also to their synchronisation.

WHAT TB-DECO CAN OFFER BESIDES PROGRAMMING

- Machine initialisation cycle:
  - Moving the cutting tool into position.
  - Moving the bar into position.
  - Cutting.
  - Moving the spindle into position.
  - Opening the spindle gripper.
- "Bar-end" control
- Loading cycle for a new bar with safety features.
- Workpiece feed/loading cycle.
- Multiple loading/feed cycles (several clamp settings for a single workpiece).
- Reference check for tools at limit position relative to workpieces.
- Reference check of counter-spindle relative to workpiece when being supported by counter-spindle.
- Safe cutting of the workpiece: inspection in the event of a cutting tool breakage.
- Safe pick-up of the workpiece: swarf on workpiece or diameter too large (severe wear or breakage of the turning tool).

the market. This is a great benefit for any user wishing to use a single system to program all their different machines.

A short history lesson…

Unlike traditional CNCs, which in the 1980s only operated sequentially, waiting for one tool to finish before activating the next one, TB-Deco technology enables tools to be fed and withdrawn during machining, significantly increasing productivity by eliminating downtime. Furthermore, the code generated by TB-Deco avoids the need for most of the real-time calculations, which relieves the CNC. This is the main reason for the great difference in productivity between Deco machines and others. The CNCs are so slow that all the « lost calculation » time can be found directly in the cycle times of workpieces made using traditional CNCs.

And nowadays?

The calculation capacity of traditional CNCs has clearly improved and the downtime is much less than in the past, enabling competitors to come closer to achieving the level of productivity seen with TB-Deco programmed workpieces. What are the other benefits of this technology? Because all the axis movements are precalculated by TB-Deco, the software's capacity allows tools to be brought slowly from their rest position up to their operating point during concurrent operation time. In addition to shorter cycle times, the smooth operation of Tornos machines also ensures that the workpieces produced are of optimal quality, with fewer jolts resulting in a better finish.

Motion control ? !

Some of our competitors are now talking about improving their systems by introducing the concept of "Motion Control". This is a standard function of TB-Deco, and has been proven for many years. It simply means controlling tools "just in time", preserving the mechanical elements as much as possible, thus reducing energy consumption and increasing the quality of the finish.

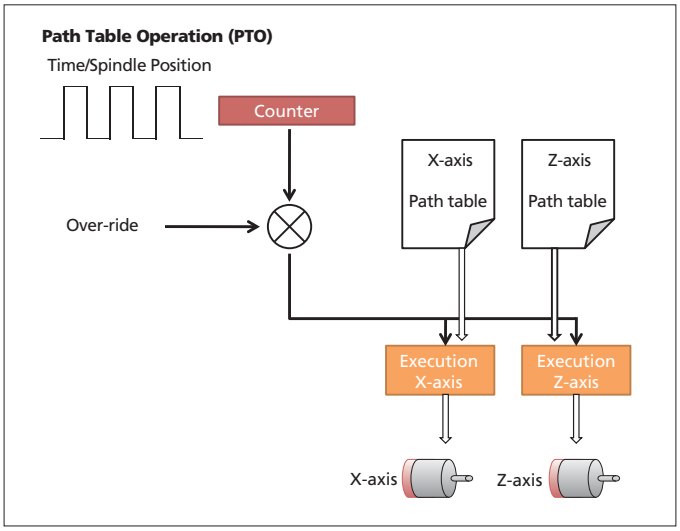
Different versions

Like any software, TB-Deco has evolved to become ever more ergonomic and user-friendly. It is now available in two versions : TB-Deco allowing basic programming of Tornos Deco machines, and the ADV version which offers a number of additional functions, for example, graphical wizards for programming the contour (eg. calculating a tangent point) or macros (eg. thread chasing), 2D simulation or viewing of a programmed contour. This version also allows Micro and Sigma machines (also from Tornos) to be programmed using an ISO Fanuc programme. For users accustomed to the power of intuitive graphic programming, this provides the option to use TB-Deco with machines other than Deco.

Working with tables ?

In the mid 1990s, the Fanuc company developed a CNC exclusively for Tornos which operated using tables, allowing each of the machine's axes and spindles to be controlled independently. This technology, which was associated with TB-Deco software, is known as PNC-Deco. This approach allows, in particular, a multi-spindle turning machine to be controlled with a single numerical control (rather than two, in the case of competitors), as the calculation load required from the CNC is greatly reduced. Tornos is therefore the only company able to use Fanuc numerical controls, whose reputation for reliability in particular is proven, on high-end machines.

Finally, Fanuc has developed a different protocol called PTO, or Path Table Operation, which will be integrated in the CNCs of Tornos including an integrated computer. This original technology opens up the possibility of predefining all the machining movements and saving them in the form of movement commands in the tables (PTO). Then, during operation, the commands contained in the tables are simply sent in the correct sequence to the actuators (machine axes and spindles) that machine the workpiece.



Graphical representation of the programmed contour.

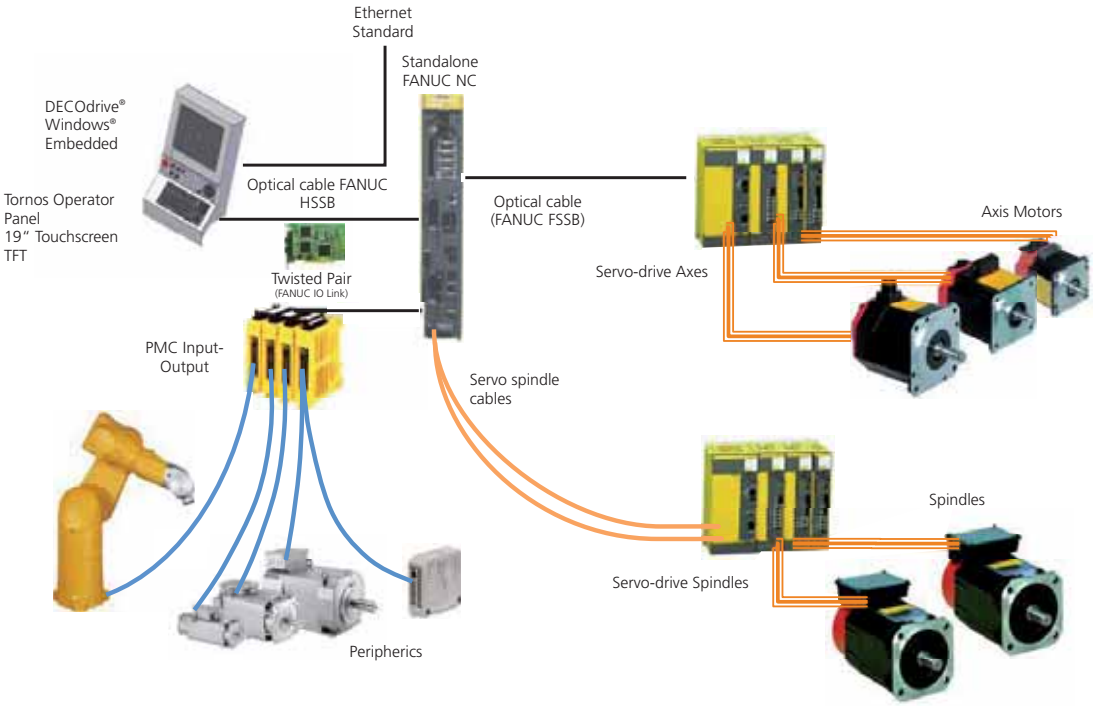
This technology has numerous advantages, among which are the possibility of better optimising the significant increase in performance of the numerical control, which no longer needs to perform interpolation, and the scope for unlimited production of all types of shapes and combinations of movements, thanks to the programme overview provided before machining.

And what about the future ?

Today, Tornos has almost 15 years' experience in programming dedicated to the bar turning industry, but what about tomorrow ? Mr. Currat, the man in charge of software innovation at Tornos has this to say : *"We are working on new solutions integrating ever more business intelligence and which are increasingly user-friendly, thanks to a Windows type interface. But most importantly, this intelligence will be installed directly on the machine thanks to an integrated PC. This approach will offer not only numerous advantages for programming our machines, but it will also provide guidance to bar turners throughout start-up and production. Future machines will aim to meet the challenge of "zero set-up time", "zero faults" and "zero availability delays".*

Tornos is therefore investing heavily in this type of solution which, while retaining the historic advantages of TB-Deco, offers a suitable technological platform for building new functions which are fully dedicated to bar turning, allowing our customers to develop their competitive edge and increase their added value compared to their competitors.

DECODRIVE, THE FUTURE REVEALED



On the new MultiAlpha and MultiSigma machines, TB-Deco is embedded in the machine thanks to the integrated PC.

From a technological perspective, DECOdrive allows the three major types of common operations – Programming – Start-up and optimisation of the workpiece programme – Production monitoring - to be brought together under the same roof. Working together with Fanuc, Tornos engineers are designing a solution which harnesses the power and flexibility of a PC integrated in the machine while retaining the functionality, performance and reliability of the numerical control. In plain language, the PC and the CNC communicate fast enough for the majority of operations performed by the operator to be controlled by the PC and the software platform, as in traditional solutions. This unique user environment will enable the production of a workpiece to be programmed, started up, optimised and monitored.

At all levels, the operator can thus develop, save, optimise and reuse the most suitable operations for his environment. In this sense, DECOdrive is unique, as it is the only bar turner control system allowing companies to develop, rationalise and reuse its expertise at all levels (workpiece programmes, start-up, production).

Just like TB-Deco, DECOdrive rationalises the cycle time, but also reduces start-up times by actively helping the operator, and improves the production quality by offering better visibility. To meet the challenges of today, Tornos is convinced that a machine must be fast not only during the production phase, but also during the start-up phase in order to respond in particular to the requirements of job lots.

Just like TB-Deco, the DECOdrive software platform contains a powerful computer which incorporates its own interpolator in order to generate tables, and a machine simulator to ensure virtual control of the axes and spindles. It therefore has all the advantages of "Motion Control" and programming assistance of TB-Deco.

In addition, DECOdrive's 3D motor offers unrivalled monitoring of almost all collision risks, and provides the necessary simulations to the user interfaces offered.

The new DECOdrive control consists of an industrial PC integrated in the machine, with a 19-inch touch screen, a waterproof keypad and a Tornos-

specific user control panel for bar turning and a Fanuc 30i numerical control.

DECOdrive software will obviously also be available outside the machine, on an ordinary PC.

User interface – 3 levels in a common environment

DECOdrive offers a unique user interface comprising 3 user levels grouped on a single interface:

- DECOdrive Programmer
- DECOdrive Operator
- DECOdrive Services

DECOdrive Programmer

The DECOdrive Programmer obviously uses the TB-Deco methodology described above, but it also adds numerous advantages, in both ergonomic and technical terms.

The benefits of TB-Deco such as the possibility to position operations visually on a time line, precalculation of movements and the operation overview required for optimisation, are not only retained but significantly improved. Programming can of course be performed in graphical mode, but also in text mode or code, and the CAM post-processors, such as Gibbs-CAM, ESPRIT, PartMaker SwissCam or SylvieExpert are obviously still part of the interfacing options. The new knowledge management module opens up the options for managing, organising, saving and modifying the machine's programmes, functions, tools and equipment for each workpiece and for each user scenario.

DECOdrive Programmer and its powerful 3D motor enable all the workpiece machining movements to be viewed and simulated in the machine environment, with visual or background monitoring of most of the risks of collision between the various pieces of machine equipment.

DECOdrive Operator

With DECOdrive Operator, Tornos has decided to introduce new generations of mechanics to the finer aspects of the mechanical and bar turning disciplines, and to help its customers find the necessary qualified personnel. To achieve this, DECOdrive Operator aims to be a real innovation for the operator, with the best tools to assist in preparing the machine, and managing and monitoring production.

DECOdrive Operator guides the operator through the various stages of preparing or starting up his machine, then informs him of the status and requirements of the particular production process. DECOdrive Operator thus reduces the risk of errors and brings down the release times.

The procedure for preparing or starting up the machine, based primarily on Tornos' experience, will gradually adapt to the operator's own method. It will help the operator choose his machine equipment and tools, then guide him in setting the environment of the workpiece and tools, before offering him the means to view and optimise the production process.

The production monitoring and management functions are primarily the operator's way of accessing useful information on the production process: current production status and future requirements, future machine requirements (predictive maintenance). Its functions also enable the machine's thermal, vibrational and other changes to be viewed, monitored and assessed.

DECOdrive Services

DECOdrive Services aims to limit downtime, and in so doing, to support the user each time an unexpected situation arises. Online manuals help you to understand why your machine is not working in the way you would expect; interactive help guides you step by step to resolve problems; alarms and warnings are explained in detail; your machine will let you know when it needs you; you know what has been modified, when and by whom; etc.

Klein & Blažek® spol. s r.o.

After Czechoslovakia was split up into its constituent parts, the Czech Republic achieved its independence in 1993 as a country in its own right. Until the Second World War, Czechoslovakia was on of the strongest industrialised nations in the world. Czechoslovakia was also the only Central European country which, until 1938, was still a democracy.

The manufacturing industry is still one of the most important economic activities, especially the automotive industry as well as the machine tool industry and mechanical engineering. The iron and steel industry plays an important part in Mähren, in the east of the country.

The Czech Republic not only produces world-famous beer but also bottles mineral water from more than 900 natural springs. Wine is produced in the southerly regions of Mährens and in parts of Bohemia. Included among traditional Czech dishes are "knedlík", a type of dumpling, which is made from potatoes or bread.

Among the most well-known Czech personalities are the art nouveau artist Alfons Mucha, the composers Antonin Dvořák and Bedřich Smetana, the marathon runner Emil Zátopek and the authors Franz Kafka and Milan Kundera.

The Czech Republic is not only known for its world standing in hockey, football and excellent beer. It was once, and still is, one of the world's leading nations in the production of mechanical engineering. It has a long tradition in all areas of mechanical engineering, whether in the automotive industry, the production of cutting machines and stamping presses, and the manufacture of systems for energetics, electronics and the aircraft industry. In the last few years, the Czech Republic became the largest producer of automobiles in view of the number of vehicles manufactured in relation to the size of the population of this small Central European country.

Czech sub-suppliers for automotive industry have come under great pressure in the last few years due to the considerable increase in the assembly of automobiles in the Czech Republic. Klein & Blažek GmbH is one of the main players among these manufacturers.

…Klein & Blažek GmbH

The history of the production plant in Štíty goes back to 1958, when production started on house bells, children's toys and Bakelite pressings. In 1970, construction was completed on the new plant, into which production of the ŠKODA Mladá Boleslav automobile plant was transferred. The production plant was privatised in 1994 and Klein & Blažek GmbH became the new owner.

Klein & Blažek GmbH was founded by Antonin Klein and Ing. Richard Blažek in 1994. In the 15 years it has been in existence, the firm has become one of the most important companies in the region. During this time, the company had increased its sales tenfold and quadrupled its number of employees. It has more than six hundred members of staff and is today one of the most significant employers in the surrounding area.

Klein & Blažek GmbH is a wholly Czech owned company, which is engaged primarily in the supply of parts for the automotive industry. It is a member of the Automotive Industry Association of the Czech Republic. Almost 90 % of its products go into the automotive industry, which has been the case now for more than 38 years.

Customers of Klein & Blažek GmbH are important global automotive plants and their business partners.

KLEIN & BLAŽEK GMBH

Sales 2008
EUR 40 million

Employees
650

Production
50 % export, 50 % domestic

Certification
ISO TS 16949, ISO 14001

Customers
Visteon-Autopal, GmbH, Nový Jičín
Škoda Auto, AG, Mladá Boleslav
Benteler ČR, KG
Seat Martorell
SAS Autosystemtechnik
DURA Automotive CZ
TRCZ
Volkswagen Poznaň
Indet Safety Systems
Alcala Industrial SA

…Klein & Blažek GmbH strategy

Their cooperation with big-name trading partners make it necessary for the company to ceaselessly meet customer requirements, whether in terms of quantity, delivery date or quality.

We offer you not only reliable fulfilment of all business responsibilities but also specialist collaboration in product and process development, quality planning,

GENERAL INFORMATION

Surface area	78 864 km²
Population	10,23 million
Labour force	5,3 million
Capital city	Prague
Currency	Czech krone

reliable delivery dates and an assurance of service after production and logistical processes are completed. Our integrated management system has ISO TS 16949 and ISO 14 001 certification.

Every year, our company allocates considerable resources for investment. The company's production and service activities are performed in reconstructed or newly built spaces, using the most up-to-date of machinery and equipment. Great emphasis is laid on customer satisfaction and good communication with our business partners and a rapid reaction to their requirements, with equal importance given to good company organisation, quality, employee training and environmental protection.

Our customers demonstrated their satisfaction in a series of evaluations. For example, in recent years, being nominated for the Volkswagen Group Award in 2005 and 2006, and winning the Visteon Important Partner Award – Metals Commodity for Europe in 2005.

...Why Tornos machines

We purchased the first Tornos DECO 13a Swiss-type CNC lathes in 2000. The high production output and reliability of Tornos machines, together with good technical support and service have convinced us of the value of investing in more machinery made by this manufacturer. Switzerland is well-known for the high quality and advanced technical level of their machinery and the Tornos company have confirmed this belief.

We are no newcomers to automated production methods. We had been using machines made by ZPS, INDEX and DMG for many years, so we were able to make comparisons. Tornos machines had already enjoyed a long tradition in the Czech Republic. Despite this reputation, and because our customers from the automotive industry place high demands upon us and examine our quality and ability to provide continuous development, we conducted our own tests and compared individual suppliers in terms of technical excellence, price and range of services on offer. We were not looking for a solution for immediate requirements but for our requirements in the future.

The revolutionary kinematics of the DECO machines, together with the newly developed PNC DECO control software and software for TB DECO programming (which is supplied as the basis for all machines), fulfilled all the conditions and objectives which we has set ourselves for the introduction of the new Swiss-type CNC lathes. We then took the step, albeit a small step, of purchasing the automated six spindle machine from the Multideco series.

>	2000	2 x Deco 13a
>	2001	Multideco 26/6
>	2003	Multideco 20/6
>	2005	Deco 20a

...even a good machine has no value without specialist personnel

Klein & Blažek GmbH pursues the policy of permanently raising the specialist qualification level of their technical staff. With every new investment in new technology, we also invest a significant part of our resources in increasing the level of technical qualification of our technicians, training staff in the new technologies, and programming and operating the machines. Our guiding principle is that the costs of part production are determined by the level of quality of our technical staff.

Our employees are trained by Tornos themselves in Moutier in programming and operating Multideco machines. Part of the training included a detailed, technical examination of the parts being produced.

Such a measure would be impossible without the collaboration of the suppliers. And the collaboration is mutual, because we then bring new and more complex requirements to the production area, faster, more accurate, cheaper and more complex products - such a simple task. For the manufacturers supplying the technologies, this is a challenge and an incentive to evolve and develop the machines and applied technologies further. We are not just looking for someone to supply our production machinery, but for someone to provide a complete technology. We have such a partner in Tornos.

The use of the TB DECO programming software allows us to calculate the production time for turned parts very quickly and with second precision, without requiring to test them on the machine, thereby achieving a very accurate calculation of the price of the new part. Reacting quickly to a customer enquiry by being able to advise a reliable price helps us to win new orders. We always endeavour to stay one step ahead of the competition.

The fact that Tornos issues software like this, which contains programming for all machine models produced, an interactive machine library, function definitions, program monitoring, graphic simulation and anti-collision tests, demonstrates their interest in a customer, not only in respect of the immediate sale of the machine but of securing a long-term partner.

...high-quality, flexible production

Investment and principal milestones in the development of the company - these ambitions are reflected in practice in the level of investment activity through which, thanks to the construction of new production areas and the acquisition of the world's most modern of production technologies in the two main production areas of pressing and machining, it was possible to achieve the well-placed position which the company now enjoys in the global market of suppliers to the automotive industry.

All machined parts are produced in new, modern production shops which meet all requirements in terms of quality, ergonomics and economics.

For Škoda Auto, we produce a total of four parts for the 1.2 litre three cylinder engine – the support plate, counterweight and two spacer washers.

Visteon-Autopal GmbH Nový Jičín is an important customer in the area of machining. The production of machined aluminium parts for an air conditioning system was introduced for this customer in 2000.

From L to R, Mr Antonin Klein, Mr Radek Hansmann and Mr Richard Blazek.

This collaboration is also still being successfully developed and, apart from aluminium parts, stainless steel parts are also being continuously introduced into production.

Every customer is looking for lower prices, a high level of quality, short lead times and a flexible solution to enquiries. We are convinced that, thanks to our modern machinery and equipment and technical expertise of our staff, our company can provide such a solution. We do not offer cheap solutions but rather an excellent ratio between quality and production costs. We produce turned parts from bars with a diameter of 65 mm, flanges with a diameter of up to 250 mm, cubical parts with dimensions of up to 400 x 400 m depending on the size of the table of the machining centre. We machine steel, cast iron, stainless steel, aluminium and also brass. We have an automated production system for heat treating products supplied to us. We have a long-standing tradition in mechanical engineering. It is also no disadvantage to be situated in the centre of Europe.

Klein & Blažek® spol. s r.o.

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TEXIMP: TORNOS AGENCY IN THE CZECH REPUBLIC

Teximp SA is an **international commercial enterprise,** which specialises in **technically high-quality products and professional advice.**

Since 1982, the company has been concentrating on the **sales in Central and South East Europe.** Teximp SA provides technical products from selected suppliers in

> **MILLING**
> **TURNING**
> **GRINDING**
> **MEASURING TECHNOLOGY**
> **TOOLS**
> **THE SOFTWARE PACKAGES**

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- Thanks to their specialist technologists, Teximp SA can provide their customers with a comprehensive and individual production and cost calculation;
- **extended after sales services;**
- **permanent training** of staff;
- **With** 11 agencies in 8 countries, Teximp SA can guarantee **professionalism and cost-effectiveness locally.**

Teximp Czech Republic:

- > 170 Tornos machines installed, of which 34 multi-spindle;
- High Tech Centre with more than 300 m² show room space;
- Certified service technicians on site;
- Teximp Czech Republic serves more than 600 customers.

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- Belgrade/SRB
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"HERE, OUR TRADITION IS PRECISION"

"If you win customers on price, you will also lose them on price". This statement by Bernhard Bäzner, manager of manufacturing equipment/processes at Prefag Carl Rivoir GmbH, indicates that this successful, medium-sized company wants to grow by other virtues. With innovative ideas, high-precision products and automated manufacturing, the company holds its own against international competition and sets new standards in this market. The success story of Prefag, set in the idyllic Walzbachtal, is closely linked with the Swiss lathe manufacturer Tornos. The two companies work in partnership, developing manufacturing strategies to produce absolute quality in largely automated processes.

The state-of-the-art machinery at Prefag is clearly dominated by the CNC single spindle automatic lathes made by Tornos.

Prefag Carl Rivoir & Co. KG in Walzbachtal have a long tradition of innovation and quality. The company, founded in 1954 by Karl Heinz Rivoir, now employs over 200 workers and since 2001 has been part of the Magnet-Schultz Group in Memmingen, a prominent manufacturer of electromagnetic actuators for a wide range of industrial applications. Within the network of companies, Prefag has specialised in the manufacture of parts and products in the field of precision and micromechanics. In addition to its expertise in manufacturing precision turned parts, the company possesses an impressive know-how in arranging the smallest of components into extremely complex assemblies. Specifically in fluid engineering and analogue measurement technology but also in automotive and medical engineering as well as increasingly in aeronautics, more and more customers are making use of this level of performance and are ordering increasing numbers of complex assemblies. The management at Prefag continues to see

Berhard Bäzner, manufacturing equipment/processes manager at Prefag still gets involved himself to help optimise the production processes.

considerable growth potential here and is therefore systematically guiding the company in this direction. Consequently, just under a year ago, a new extension was put into operation, creating an additional 5,500 m² of production space, which perfectly reflects this holistic process approach. The pivotal element is the state-of-the-art turning shop with just under 90 lathes, most of them from Tornos.

From supplier to systems partner

Prefag's roots lie in the manufacture of components for the watchmaking industry. This experience and the company's strengths in micromachining have been developed and refined over the years. And now, the company is rated as one of the proven experts in complex lathe work. Besides the conventional materials, the company processes all materials from special quality stainless and acid resistant steels through machining steels to exotic alloys. The batch sizes range from one piece to eight million, with tolerances far beyond those that some others might be able to provide. But that's not enough. Prefag doesn't just want to be a supplier of customer-specific products; its particular strengths lie in system partnership. Together with its customers, Prefag analyses the workpiece and manufacturing process and, where necessary, suggest modifications to the component. At the same time, the Prefag experts will usually already have an eye on the downstream process steps and possible assembly. There are currently two trends to be seen here. On the one hand, parts are getting ever smaller and the tolerances ever tighter, on the other hand, an increasing number of functions are being integrated into these parts, making them increasingly complex. The manufacture of these parts also places increasingly high demands on the machine tools. Milling in all directions; eccentric centre drilling; cross drilling, offset to centre; thread cutting, moulding, chasing on the front and back in one set-up: these kinds of specifications are increasingly common. Before buying a new machine, Prefag therefore invests a lot of time and care into choosing the brand. The machines must be fast, precise, productive and, above all, flexible. About fifteen years ago, the responsible people at Prefag were one of the first in Germany to choose the Deco 10 - and they have never regretted this decision to this day. *"The machine simply convinced us of the concept - and even proved itself under tough practical operating conditions, with impressive results",* comments Bernhard Bäzner, manager of manufacturing equipment/processes at Prefag. However, what impresses him and his superiors even more about Tornos is the flexibility of this Swiss manufacturer.

"Most machine tool manufacturers get as far as the counter spindle and then think no further", protests Bäzner. But money is not only earned at the cutter, but rather in the whole process. *"Anyone who simply ejects micro-precision manufactured parts into a crate cannot sit and wonder why his scrap rates might be rising."* A machine tool manufacturer who, together with the user, looks at the production process holistically and develops solutions to transport, quality assurance, assembly and logistical issues, makes a significant contribution towards the competitiveness of his customer.

Cooperation that benefits both parties

As Tornos and Prefag follow a similar business philosophy, they made a cooperation agreement some time ago. Tornos includes Prefag in the development phase for new machines, where it is able to make use of its years of practical experience. Conversely, Prefag informs Tornos about new demands on precise manufacturing tasks and the two parties then work together to develop the solutions. This works because there are experts on both sides who know what they are talking about. Tornos is not yet so large that it procrastinates decisions or makes decisions too late. The company is very flexible and operates in a very customer-oriented manner. Prefag therefore sees no risk in always being the pilot user for new developments. This applies even for the recently introduced Micro 8 which, after some usual teething problems, is now working to complete satisfaction. This machine has proved to be very temperature stable, which is extremely important for adhering to manufacturing processes with tight tolerances. Particular value was placed on this characteristic when choosing the machine and during the preceding research. Therefore, in the new hall, the Micro 8 machines were consciously focused on an area in the middle of the hall. This detail alone shows how meticulously Prefag plans its processes. The procedures are closely analysed and continuously optimised. Of course this requires highly skilled and motivated staff. This is something of which Prefag is justifiably proud. The company draws upon a long-serving team of employees and regularly trains up enthusiastic junior staff. These juniors are generally employed by the company after their training is complete, and bring with them new ideas. Prefag has extremely high demands and the responsibilities are very varied. As well as turning, the company carries out all downstream steps such as necessary further processing, grinding, hard turning, honing, etc. right up to the mounting of complete assemblies. For this and for the automation of certain operations, the team consciously devel-

From the unusual design for a workplace of this kind and the extreme cleanliness, to the low noise level and the optimum temperature, all this lays the ideal foundations for the production of quality.

Berhard Bäzner, manufacturing equipment / processes manager at Prefag (left) and Erich Beuttenmüller, Tornos sales representative.

The intelligent arrangement of machines, measuring station and periphery ensures a problem-free production process.

ops simple but efficient solutions. The company has by now acquired such a high level of expertise in this area that assembly machines and parts handling equipment are designed and built on machines in the company itself.

Quality is produced, not measured

A market segment that is currently growing steadily is aeronautics, which of course presents Prefag with new challenges, due to its strict quality guidelines and audits. However, the company mastered these challenges superbly and besides all the usual certificates it also has the approval from the Luftfahrt-Bundesamt (German Federal Aviation Authority). The astonishing thing is that although there is a superordinate QA department, each individual worker is responsible for quality. Only if he comes across problems in maintaining quality does he turn to the superordinate parties. This climate of trust is reflected in the whole company. From the unusual design for a workplace of this kind and the extreme cleanliness, to the low noise level and the optimum temperature, all this lays the ideal foundations for the production of quality. And of course the state-of-the-art machinery makes an added contribution. Anyone who needs to deliver maximum performance to his customers must inevitably make equally high demands of his own machine tool suppliers. In Prefag and Tornos we have two partners who perfectly complement each other and are mutually successful.

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PARTNER IN PRÄZISION

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"Horlogerie" Synergy Project:

TECHNOLOGY HEADSTART THROUGH EXCHANGE OF EXPERIENCES

Mechanical movements are in fashion. By implication, each timepiece has several hundred high-precision small parts for a mechanical masterpiece. A blank therefore contains around 50 % traditional "décolletage" or turned parts. Larger components, including the bottom plate, bridges and more and more frequently watch casings are milled and stamped. In the context of a Synergy Project with a range of production experts from the watchmaking sector, MOTOREX have designed high-performance machining fluids for both traditional décolletage and micro-machining.

When talking to production managers from the watchmaking sectors these days, it immediately becomes apparent that the requirements and expectations on the current generation of machining fluids are very high. On the one hand, they need to be adapted to the ever more extreme challenges facing production techniques and on the other hand, are required to be exceedingly economical and environmentally friendly. A balancing act which can only be achieved if the lubricant suppliers maintain a permanent dialogue with practitioners from the watchmaking sector.

The benefit of multi-purpose cutting fluid

Several experts from all relevant fields have joined forces in a project group to analyse the needs of the sector. This is the only way of being in a position to meet the ever-increasing requirements successfully in the future, too. This way, in the field of

The milling results with MOTOREX ZOOM XS were precisely monitored during the Synergy Project and recorded in compliance with a measurement report.

A diverse range of tools were used in modern machining centres for each individual operation. The changeover was fully-automated.

high-performance cutting fluids, MOTOREX and their ORTHO cutting fluids were able to successfully cover a central request from the sector : universal use. An ever-increasing number of bar turner customers request a single cutting fluid for diverse operations on diverse materials and machines (see also quote from L. Klein SA).

The chlorine-free and heavy metal-free cutting oils are designed for a range of challenging bar-turning operations in the watch production sector. Various well-known watch manufactories and specialist blank producers (Ebaucheurs) are now focusing their attention on efficient utilization of machine performance with increased production quality. Thanks to the success of ORTHO-cutting oils with the integrated Vmax-Technology and considerable experience in the field, MOTOREX has built up a considerable amount of trust within the sector.

Growing trend : Micro-machining

Alongside traditional bar turning, micro-machining (milling, drilling, grinding etc.) in the watchmaking sector is going through an upward trend. Here, the variety of materials used is striking. Watchmakers seem to be almost surpassing each other in the use of extremely hard-to-machine materials. When striving to make the impossible possible, more and more high-performances are achieved and innovative timepieces are launched. MOTOREX are making an active contribution with the appropriate oil technology in this field.

'Horlogerie' Synergy Project :

The 'Horlogerie' Synergy Project has enabled many new features to be identified in cooperation with timepiece production practitioners. This is also the case in micro-machining. MOTOREX matched the ZOOM XS machining oil with the requirements of the current machines and workpiece generation and has subjected in to extensive practical tests.

MOTOREX ZOOM XS is markedly stable under high pressure. This way, machining operations can be controlled in all situations. The result is high quality surface finishes on all materials. The outstanding cooling

The plates were cleaned after operation. Both fluids, MOTOREX ORTHO and ZOOM, can be removed rapidly and without leaving any residue

Whether in brass, titanium or high-tensile steels – the watchmaking sector brings ever-more innovative timekeepers and technologies to the market.

"RAPIDLY INCREASING VARIETY"

"It is a fact that there has been a sharply rising trend in the materials used in the watchmaking sector in previous years. Mainly temperable chrome steels and sulphur-free chromium nickel molybdenum steels (316L) are used. Because manufacturing technology for stainless steels and metals is changing, we can also supply the sector with very exclusive materials including titanium, cobalt chrome, nickel-free and AISI 904L. In the luxury watchmaking sector, high-tensile steels such as 1.4441 (Implant steel), 1.4472 including Phynox are more and more commonplace – these are indeed more difficult to machine, but as far as quality rating, scratch resistance and polishability are concerned, they are in a class of their own. The smallest turning parts (e.g. 1.5 mm long screws) are also now often manufactured in powder-metallurgical steels (Law 100 X). The technology did not even exist a few years ago!"

From left: Philippe and Oliver Schiess
Owners L. Klein SA, Biel.

The turned parts sector, watchmakers push technology to the limit - both with materials and quality specifications.

performance also leaves the original colour of the metals unchanged. The particularly low-viscous (ISO VG 7) fully-synthetic oils flushes out material swarf from the tightest of notches and provides workpieces with effective protection from wear.

Cutting costs – protecting the environment

The current generation of ORTHO and ZOOM products is harmless for man and the environment and is therefore all part of ideal working conditions. It does not only have a positive impact on working conditions, but also helps to reduce costs when it comes to disposal. The integrated MOTOREX Vmax-Technology also improves productivity and extends tool lives commensurably.

We would be delighted to provide you with information on the latest generation of machining oils for watchmaking and the optimization possibilities for your organization:

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EXTRAORDINARY COLLETS AND GUIDE BUSHES

When we met up with him at mediSIAMS, M. Daniel Dünner, director of the company of the same name, showed us his new developments using advanced technologies. In the medical sector, in particular, there are more and more constraints, certain materials and alloys are ruled out and part complexity is often considerable. Wherever possible, these parts need to be finished on the machine without secondary operations. All these requirements have a definite influence on the choice of technologies used in production methods.

Very specific products

Dünner, founded in 1935, has been supplying specific tooling for automatic turning machines for almost 75 years and exports are virtually 80 % of its products. This long experience allows it to offer solutions that meet customer requirements. *"We have developed and patented niche products to help our customers make their components in the best possible conditions,"* says Mr. Dünner.

Clamping on a thread ? No thank you

The wide-mouthed collet enables a workpiece to be seized in secondary operations with a diameter that is larger at the front and smaller at the rear - clamping on the small diameter. The larger diameter is therefore inside the collet, and as there is no clamping here, the finish on this diameter is guaranteed mark-free. This type of collet therefore avoids having to clamp workpieces on the threads. As far as fragile

workpiece clamping is concerned, Dünner also offers a system which limits the clamping. *"This technique has proved its worth over the years; although many customers are not familiar with this application yet, which is a pity"* says Daniel Dünner, who adds: *"The secondary wide-mouthed collet needs to be custom-design based on the workpieces to be machined. Sometimes the simple fact of having this option at your disposal can convince a customer to purchase a machine"*.

Avoiding jamming

As a second application, in the guiding domain, Dünner makes a range of guide bushes in New Surf ceramic. This technology prevents jamming and is available for rotating and fixed guide bushes. M. Dünner continues: *"We guarantee that using a New Surf ceramic guide bush prevents any jamming when machining steel or stainless steel. The same does not apply to titanium. Everything depends on the type of titanium and the quality of the material. As for the type of oil used, we have observed that what is important today with New Surf guide bushes is to use an oil with a good level of cooling, but particularly oil that treats cutting tools with care!"*

Following the increase in cutting speeds on turning machines, jamming in the hard metal guide bushes has become a more common occurrence and these last few years particularly with the use of G0 for withdrawing the guide bush. The customer needs to reduce the drawback speed in the guide bush to prevent jamming. Certain constructors have brought about improvements, blocking the guide bush mechanically once it has been set, for example.

Mechanical blocking

This mechanical blocking needs to prevent the G0 drawback movement from causing the guide bush to withdraw slightly and thus causing unwanted clamping on the material that would automatically mark the bar or cause jamming. As machines become faster and faster, mechanical blocking is often no longer sufficient. The increased clamping effect on the withdrawn material is a common occurrence and the best solution is to use a New Surf ceramic guide bush. The benefit of ceramic is its friction coefficient, reduced by 60 % compared to a carbide guide bush, which prevents the material from 'peeling' when using G0 drawback. Another benefit of ceramic is the option of creating more tension in the guide

bush during the setting, which allows for more precise dimensions and an improved machining finish. Indirectly, the cutting tools work in optimum conditions. There are no micro vibrations, which damage the tools' cutting angles.

Three-position guide bush

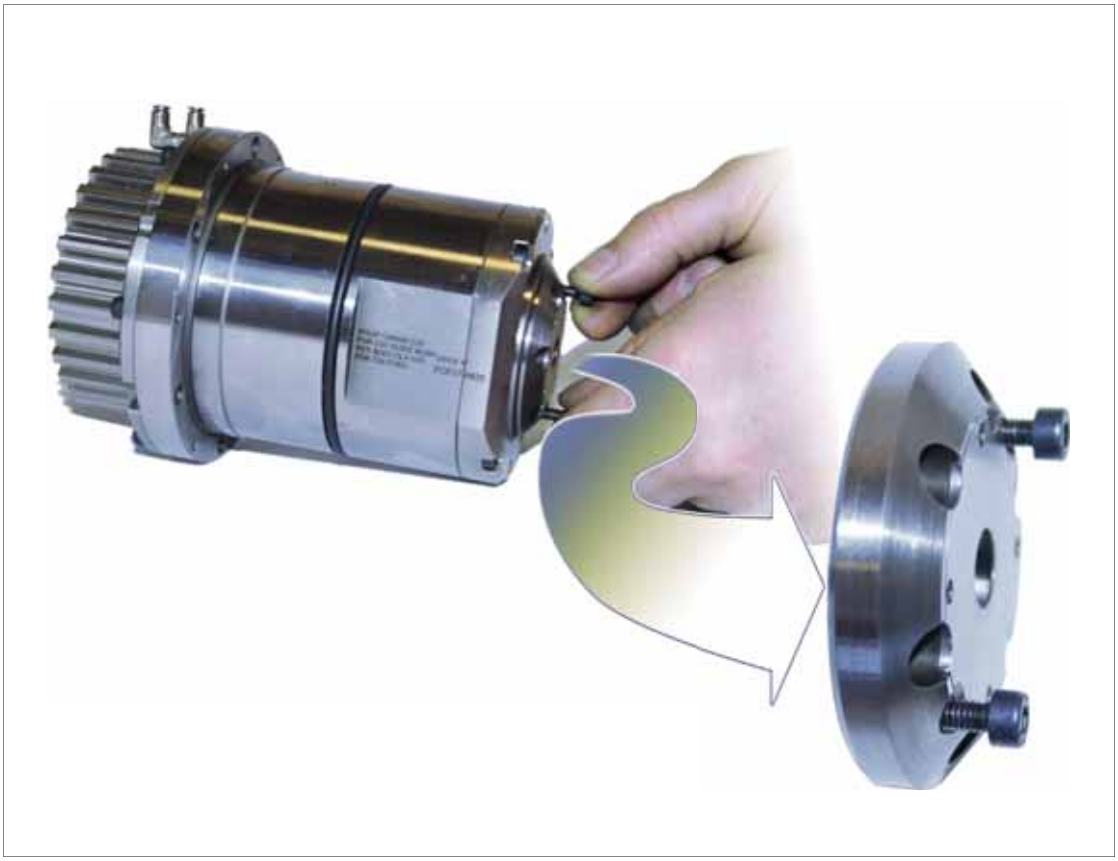
Still in the guiding domain, the three-position guide bush allows for guiding, clamping and opening to be done automatically based on the user's preferences. This three-position guide bush is a rotating device, with a compressed air connection varying the air pressure on the closing piston. A series of electromagnetic valves is placed in the machine and everything is controlled by M codes. The M functions can be defined to guide, clamp or open the guide bush. Adjustable from the front, this guide bush is very straightforward to use and highly flexible. By clamping it, the machine becomes more rigid for milling operations. In an open position, loading the material or extracting falls are simplified. The clamping force can be adapted to suit the different machining operations to be carried out. The clamping length of 40 mm is exceptional when compared with a standard guide bush (3-5 mm) and guarantees a perfectly parallel clamping. It is available in three versions: bronze, tempered steel and hard metal.

Collet without body

"The fourth product we are presenting is a collet called Long Star. In contrast with a standard collet, this one has no body. It is designed to increase the clamping force," explains Daniel Dünner. The original problem was simple, the company wanted to improve the large-dimension collets, providing them with a clamping force greater than anything previously available. The type F collet used in all the turning machines offers the benefit of precision and clamping stability. When using it with large dimensions, one of Dünner's customers noticed the material tended to withdraw when the force increased. The user had two choices: either reduce the feeds of the machine or change the entire clamping system and invest in a costly drawback collet system, which would deprive them of the benefits of the type F collet.

Technical tip…

After analyzing the situation, it turned out that the weakness of the F collet was due to two factors. First, the spring positioned in the sleeve of the collet and second the opening of the collet supplied by the manufacturer as well as the sealing rubbers positioned in the grooves. The challenge facing Dünner consisted of creating a collet with all the benefits of



the F collet but with none of the disadvantages. *"By removing the body of the collet and retaining the taper of the collet sealed by the vulcanized rubber, we achieve a precise collet, with a high clamping force airtight enough to prevent swarf from penetrating the clamping sleeve. The precision of the collet is down to the fact that we use the taper of the sleeve as reference and the face of the clamping nut which aligns the collet in the housing. The vulcanized rubber in the grooves provides the opening force and at the same time replaces the spring,"* says Mr Dünner.

…for probing results

A prototype rapidly convinced the user who tested the first workpiece. With this collet, the clamping force increases by at least an average of 30 %. In addition, the clamping efficiency is improved given that this is carried out in parallel (no connection point at the rear of the taper of the collet). The clamping quality is therefore far superior, enabling the collet to be used in a clamping range of 0.5 mm without clamping the front of the collet, and in excellent conditions.

…also in the medical sector

Material machined for the medical sector is often alloyed and therefore more difficult to machine. This type of collet is therefore particularly well-suited. For materials with poor external quality, including plastic, aluminium, laminated steel, the Long Star collet is the perfect solution. It is now no longer essential to invest in expensive adaptations. The machine can simply be used with a traditional collet and a few minutes later with a Long Star collet.

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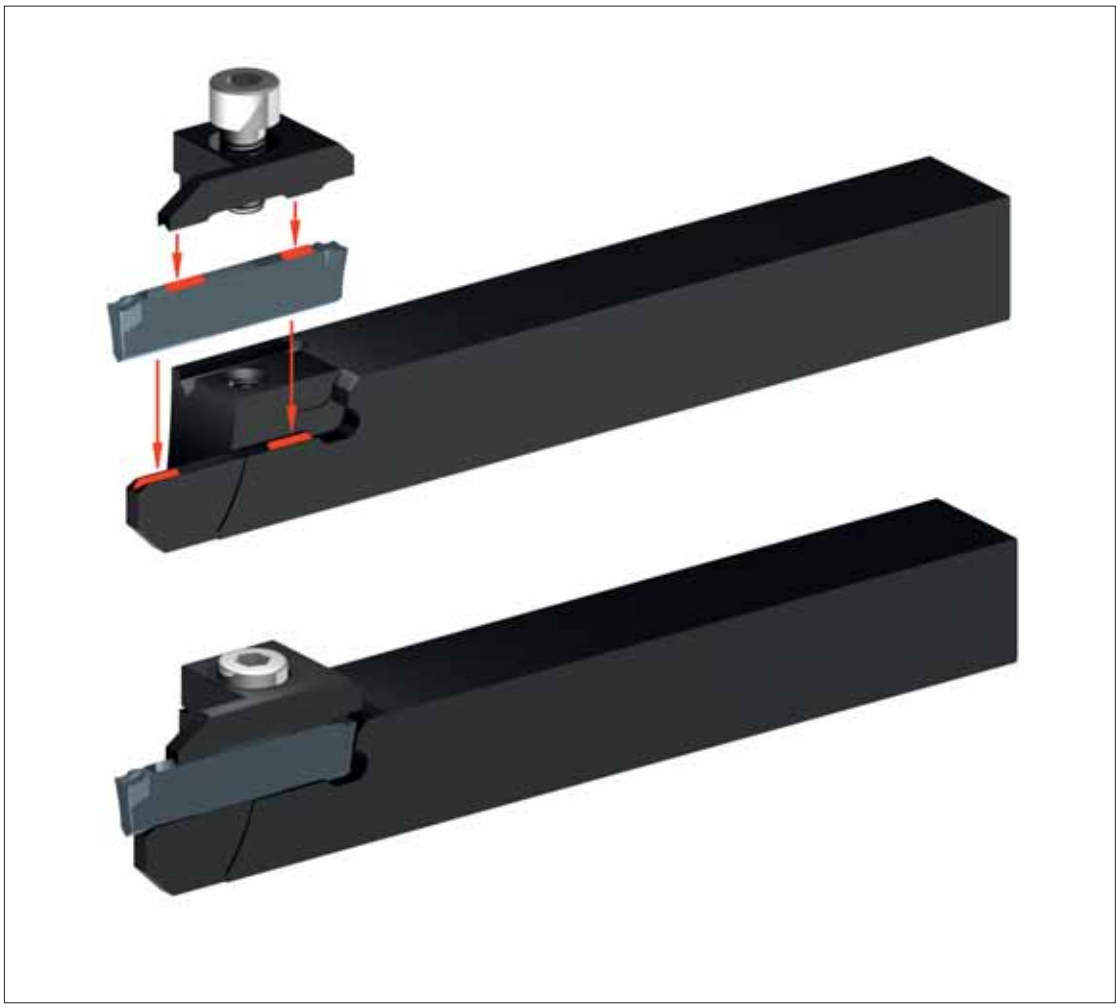
RIGID CUTTING

While Applitec is known as a specialist in tools for bar turning, a solution designed for cutting relatively large diameters was missing from their range. With the introduction of the new Cut-line, this gap is filled. A meeting with François Champion, Sales and Marketing manager at Applitec.

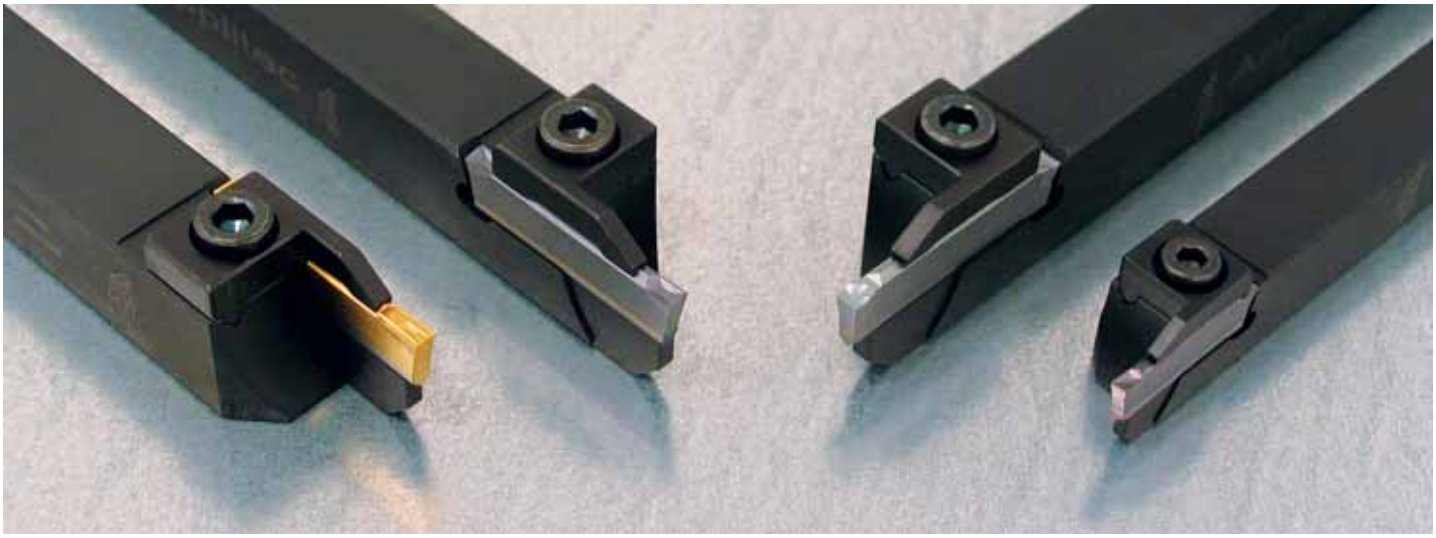


Customer-led research and development

"Customers are always on the lookout for the best performance and excellent reliability" Mr Champion told us. Therefore, the manufacturer continued its research and tests to arrive at the solution being put forward today. The insert is clamped vertically across two zones using an independent flange system. This principle provides much greater rigidity than systems fitted with a mounting which relies on the elasticity of the tool holder for clamping the insert. The insert itself has a new high-performance geometry which allows the chips to be expertly managed and provides a very good surface condition when machining.

Quality and service life

As the rear clamping zone for the insert is located in the full section of the tool holder, deviation during cutting is therefore minimised, so the sectioned face of the part does not show any signs of tapering.



Even more importantly, the rigidity and simplicity of this clamping ensure the tool holder is highly reliable with a long service life. As no compromise had to be made for a clamping system with a flexible flange, it was possible to optimise the materials and processing of the tool holder so as to obtain the best results in terms of machining performance, reliability and quality.

Expansion into turning

Questioned as to the desire to head into the turning domain as well as bar turning, Mr Champion explained: *"At the start, we decided to create this line for bar turning, but a strong demand quickly led us to equip conventional turning machines with a fixed headstock and revolver turrets. We can therefore offer a complete line with a cutting capacity up to a diameter of 42 mm"*.

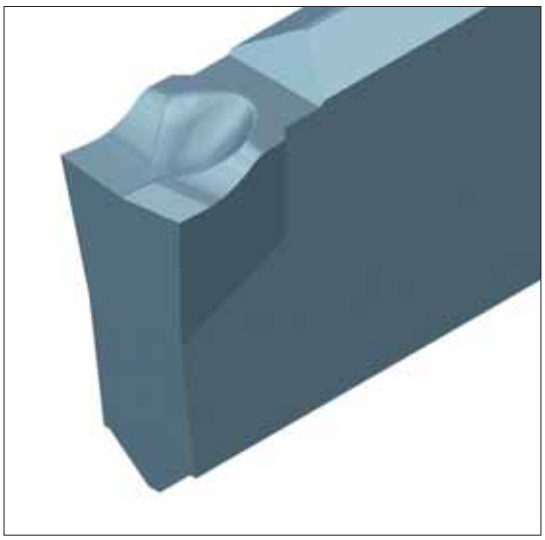
Available from stock

The tools are available in squares of 10 to 25 mm for cut widths of 1.60, 2.20 and 3.10 mm, and may cut up to a diameter of 42 mm.

These inserts and the tool holder are available in stock from Applitec distributors in all the dimensions given above.

THE NEW CUT-LINE IN DETAIL

Tool holder:	**H** up to Ø 34 mm **HX** up to Ø 42 mm **HS** with an extra-short clamping flange, (requires the option of adjusting the centre height on the machine)
Bars available:	c 10, c 12, c 13, c 16, c 20 and c 25 mm
Cut widths:	1.6 mm, 2.20 mm and 3.10 mm
Insert grades:	**TiALN**, universal PVD coating for machining steels, stainless steels and titanium alloys. **Tmax**, thick PVD coating, specially suited to moderate to heavy machining of carbon steels and high alloy steels. **AS**, PVD coating for non ferrous metals.



If you wish to find out more about this new Cut-Line, please do not hesitate to contact Applitec at the address below. You can also download the general catalogue or Cut-Line catalogue at the following address : *http://www.applitec-tools.com/index.php?lang=fra&frame=download*

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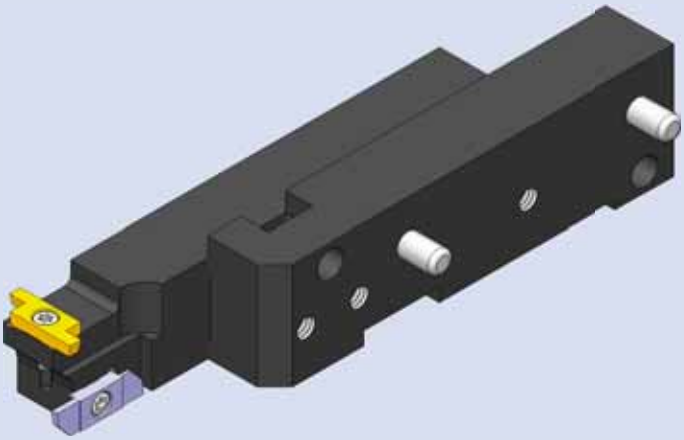
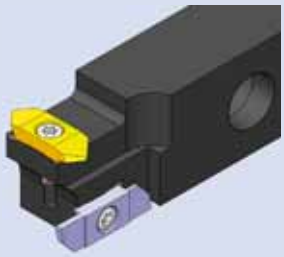
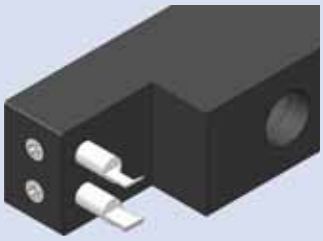






Complicated profiled inserts

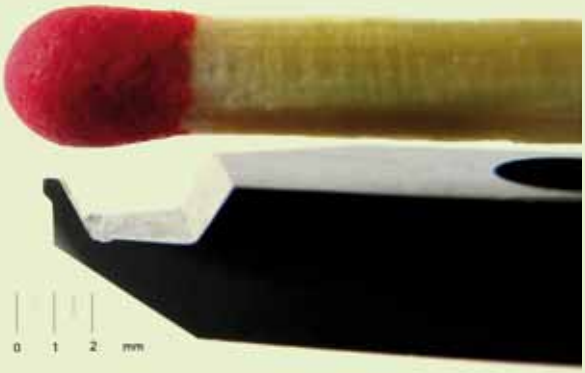
⇨ Offer available from 5 inserts !

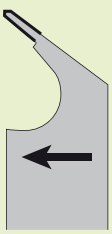
Komplexe Profilwendeplatten

⇨ Angebot ab 5 Wendeplatten !

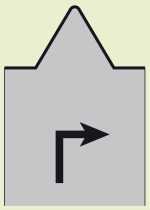
Plaquettes à profils complexes

⇨ Offre à partir de 5 plaquettes !

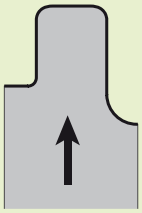




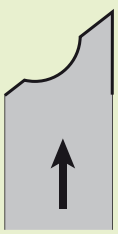
Trepan tools
Trepan Werkzeuge
Outils trepan



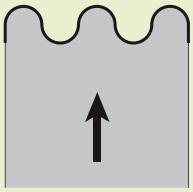
Threading inserts
Gewindeplatten
Plaquettes de filetage



Grooving inserts
Einstechplatten
Plaquettes à gorge



Special cutting inserts
Spezielle Abstechplatten
Tronçonneurs spéciaux



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