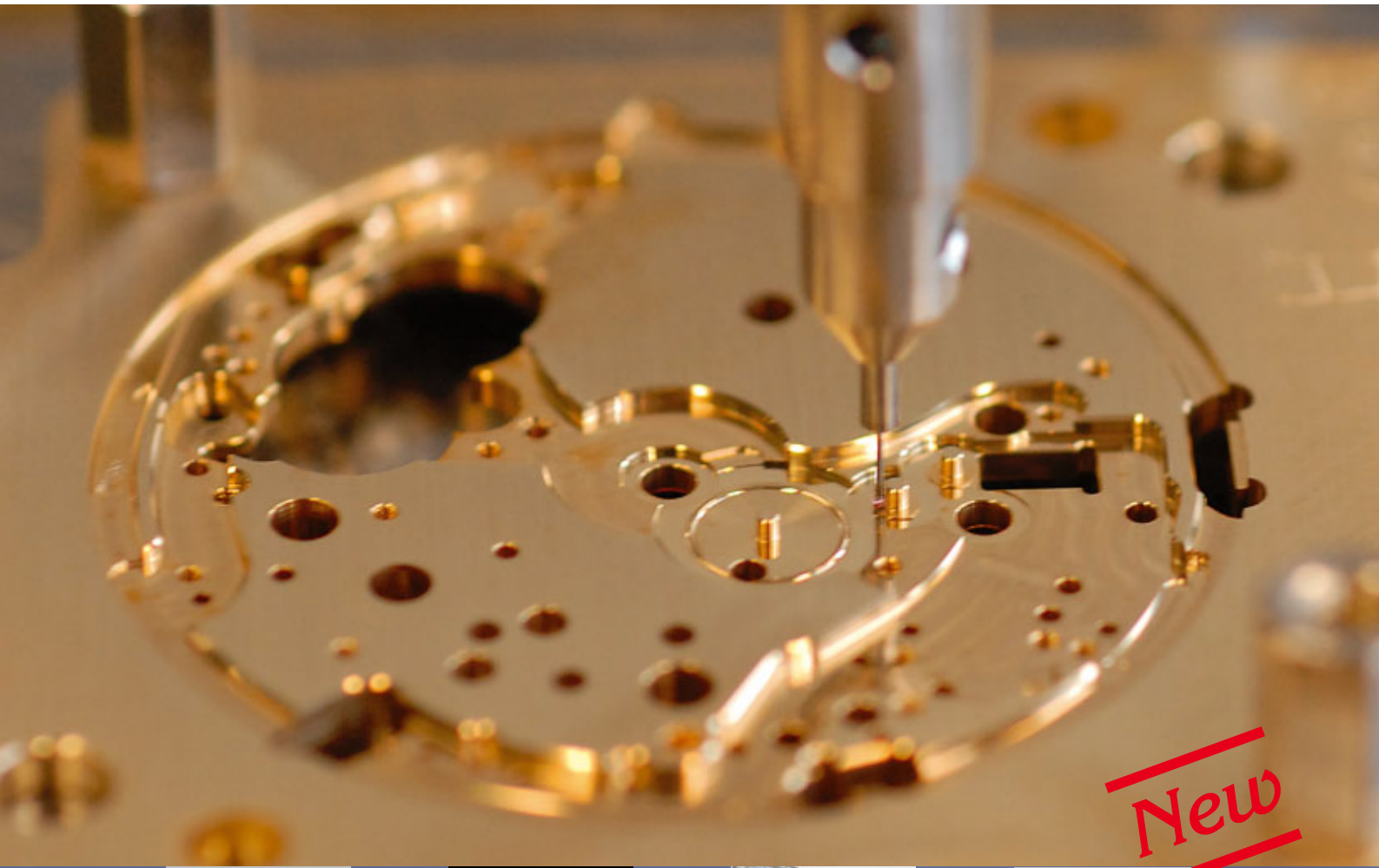
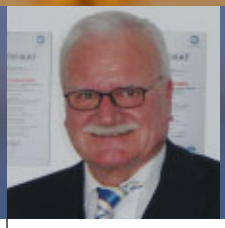
decomagazine

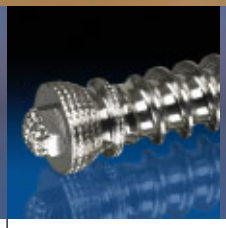
THINK PARTS **THINK TORNOS**

45 02/08 ENGLISH

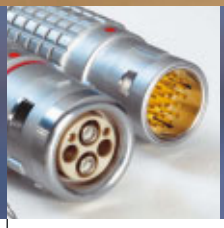




Quality,
made in Germany.



As simple
as a screw.



They make sure
the signal is received, whatever the conditions!

Nine products
from new range launched simultaneously!

37

Replace precision ground material… and a lot more besides!

44

Repeat success…

58

Why line «e»?

62

Nine products from new range launched simultaneously!

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SUMMARY

NEW, NEW, NEW…

New!

This editorial is about **new releases**…

When putting together this edition, that's what hit me. **New** machines (Delta on page 62 and DECO "e" on page 58) but also **new** developments (single-spindles on page 44 and multi-spindles on page 41), **new** agreements (Almac on page 52) or even **innovation** in the tool sector (Pages 37 and 42).

Is that all that's left for us – to tell you about what's **new**? Does the customer really want all these **innovations**?

And what's more, our sector is relatively unaffected by obsolescence of products due to the arrival of **new** developments on the market. Look at the leisure electronics sector. I bought a high-end digital camera a few years ago – 4 million pixels was the latest thing – nowadays 10 or 14 million pixels or more are commonplace. This is nothing out of the ordinary for our society. We know that what we buy today is already out of date.

Take the advertising sector. Of course, we know they play with our emotions, but also with the power of what's **new**. The word **new** never goes out of fashion and none of us can resist it! There will always be the pioneers buying the first **new** trendy gadgets in the same way as there will always be the first users of **new** industrial equipment. Why?

I have talked with many machine owners and often with "early adopters[1]" including investment goods. They are not concerned with the emotional side and the "image" (even if these aspects certainly come into the equation) but rather are focused on the benefits to be had from these products. Being amongst the first to have **new** means of production often allows you to be the first to enjoy all the benefits. Of course, what is **new** is not an inevitability and it is always possible to avoid it and work with older cam-type machine… until when?

The race for what's **new** and **innovation** seems to be inevitable. As an individual, we often look to improve on certain features of our products (computer[2], mobile phone etc.) and companies operate in exactly the same way. If we can work more efficiently, more rapidly or at higher quality levels, why not take advantage?

We are all sensitive to different criteria and if manufacturers are continuously releasing **new** products, it's also to offer that extra something to their customers…

We should be happy. Hundreds of engineers the world over are working to bring us ever more effective solutions. Why deny ourselves?

Talking of what's **new**, we'll be back in the autumn[3], just before the AMB show in Germany and IMTS in the United States for a **new** edition of **deco**magazine…

Pierre-Yves Kohler
Editor

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1 Early adopters according to the diffusion of innovation theory by Everett Rogers. http://en.wikipedia.org/wiki/Everett_Rogers

2 Another sector where to buy a new product is already to own an outdated model!

3 Until then you can stay connected on our blog (another relatively new invention to stay informed more rapidly on the latest innovations!) at the following address: http://decomag.spaces.live.com/

QUALITY, MADE IN GERMANY

A company rich in tradition with an emphasis on Swiss precision is fast becoming the market leader.

Ten years after the company was founded, the parent company of Schimmel GmbH in Nordheim added a modern subsidiary plant in Adelsheim.

Rainer Schimmel, the managing associate of Josef Schimmel GmbH in Nordheim is a traditional person, for whom the traditional German virtues of precision and reliability continue to remain an essential component of his business activities.
To turn this claim into reality, however, he focuses on ultra-modern technology and trend-setting production processes. This strategy has enabled the company to develop into a global market leader in technical screens including metal and plastic filters. The manufacture of precision turning workpieces is also growing in importance. These are produced almost exclusively on Tornos multi-spindle turning machines.

The roots of Josef Schimmel GmbH go right back to 1949. This was the year the father of the current owner, together with two colleagues, started manufacturing metal screens and filters in the family garage. Initially, these were mainly sold to local fitting manufacturers. Josef Schimmel quickly moved on to the manufacture of complete special fittings, angle valves and non-return valves. At that time, the turned parts required for these items still needed to be ordered from external suppliers. The order book was overflowing and by the early Fifties, there was a bottleneck of the supply of turned parts.

On the spur of the moment, Josef Schimmel decided to purchase a new turning machine and the foundation stone of the current precision turning production was laid. In the meantime, the company had reached the limits of its capacity after ten years with 85 employees. In 1959, the new factory was commissioned in Adelsheim, later to be expanded and modernized in 1972, 1982 and 1998. Today's high-tech production facilities in all areas extend to 15,000 m^2. Technical screens, metal and plastic filter elements, automatic turning machine components, stamped parts, plastic injection-moulded compo-

Dipl.-Ing. Rainer Schimmel is committed to the traditional values of precision and reliability and is proud of certifications acc. to DIN ISO 2001, ISO/TS 16949 and VDA 6.1

Equipped with high-tech in all areas, the Adelsheim plant now manufactures on a surface area in excess of 15 000 square metres.

Complex precision components from an exceptionally diverse range of materials in short and long production runs are manufactured using ultra-modern production methods.

Plant manager Horst Schmidt explains the latest shift plan to Sven Martin, Tornos, and Rainer Schimmel.

nents as well as special fittings are manufactured in small and large series.

From suppliers to the system partner

When the current company director, Rainer Schimmel joined the family enterprise in 1972, it once again took a major step forward. He began production of plastic filters and in doing so laid the foundation stone for the adoption of a new technology and a new self-image. Most people are probably familiar with small filters in hot water containers, household appliances or aquaria. The small filters in car fuel tanks, windscreen wiper units, hydraulic piping in roof systems on convertible cars is certainly concealed from view but they are there – in their millions.

And hardly anyone gives a thought as to how difficult it is to manufacture such filters. The material, sold by the meter, has to be perforated in such a way it does not rove and must be hard-wearing and blend in with the plastic, with no projecting edge. The material must also be heat-resistant and able to withstand certain chemical products. It comes as no surprise, therefore, that competitors in this area are few and employees take a certain pride in their abilities and company. In addition, virtually all tools and prototypes are manufactured in-house. Around 65 percent of filters are supplied to the automotive sector and their partners. The customer list at Josef Schimmel GmbH therefore reads like a Who's Who of international automotive constructors. Audi, VW, Daimler, BMW, ZF, Bosch – all well-known names who have had close corporate ties with the company for a long time. In most cases, the business relationship goes well beyond the supply of parts. Josef Schimmel GmbH is becoming increasingly involved in the entire development process and supply chain.

Experts in precision turned parts

The constant upward trend of this sector can be explained by three major factors. First, the company itself requires ever more turned parts. The trend is pointing towards the supply of components and complete assemblies. The developer therefore orders ever more complex, smaller parts, sometimes in exotic materials from the filter department at the turning shop. This internal exchange of expertise and technology transfer is good news for the turning special-

Clean and tidy: the presenting front of the generously proportioned production building in the Adelsheim plant.

Standing in serried ranks: the Tornos CNC multi-spindle automatic turning machines and lathes in the Adelsheim plant.

ist when requests are received from external partners. If a partner supplies highly complex assemblies in short lead times with top precision levels at the right price, then they are also entrusted with low to high complexity turned parts. Rainer Schimmel and his employees are however meticulous about justifying this good reputation. It is for this reason that they rely on 15 Tornos CNC multi-spindle turning machines including three Tornos single spindle turning machines.

The Tornos partnership has proved to be a lucky strike

Rainer Schimmel has smiles as he recalls the beginnings of his partnership with Tornos. In 1990, along with his master technician, he visited virtually all known manufacturers of multi-spindle machines and he was more than a little sceptical when his colleague opted for an SAS pilot machine. But he put his faith in the competence of his master technician and has had no regrets. The machine was purchased in the same year and has been running round the clock since then. The rapidity and high dependability of the machine has meant that it quickly amortized and Rainer Schimmels early scepticism had turned into elation.

Within the next eight years, a further 10 machines were bought and put into service. However, the range of parts is continually changing and Rainer Schimmel took the decision at the end of the Nineties to step up to CNC technology: "A businessman has to be flexible and he requires machines which work for you rather than the opposite". The MULTIDECO 26/6 seems the most appropriate machine to meet this need and by all appearances, this is the case. Within a short space of time, two additional CNC six-spindle MULTIDECO automatic turning machines and one CNC eight-spindle MULTIDECO 20/8 automatic turning machine followed. Despite this replenishment of the stock, Josef Schimmel GmbH reached the limits of their capacity once again. Each year, around 3000 different parts are produced, in batches of 100 to 12 million parts annually.

A decision for the future

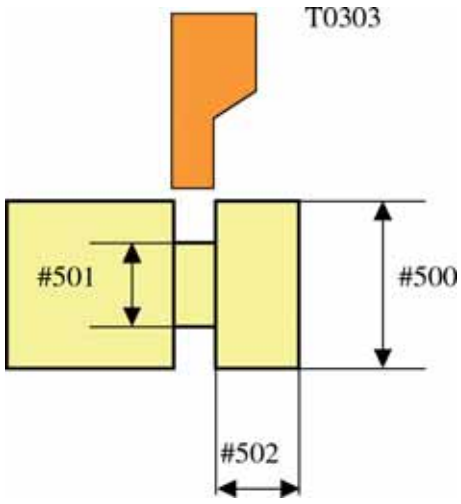
Rainer Schimmel is optimistic about the future and stands in defiance of all the prophecies of doom concerning the manufacturing base in Germany. "I believe if we remain true to our virtues of precision and reliability and continue to build on our position as leaders in technology, there is no competitor we need fear". A prerequisite for this is motivated and well-trained personnel. For this reason, Schimmel GmbH together with Tornos is investing a great deal in employee training. And it's paying off. For the fourth year in succession, a Schimmel GmbH apprentice was top of the class in the Mannheim Regional CCI in 2007, a success everyone can be proud of. All enjoy working with Tornos machines and give their best. Commitment is what singularizes this team and thanks to the DECO machines, the personnel is in a position to make a real difference with their experience and expertise, to manufacture ever more complex parts more quickly and with more precision. The question asked at the start, what do you do better than your competitor? Rainer Schimmel answers with a shrug of the shoulders. Following this visit to the Adelsheim production facility and after talking to his employees, it has become clear that there are people at work here who want to be successful and are. The concept of optimization can be felt throughout the whole company and, for precision-turned parts manufacturing, a perfect partner has been found in Tornos.

Schimmel GmbH has grown into a global market leader with its range of screens and filters for virtually any conceivable application.

TRICKS AND TIPS

In a previous edition of decomagazine, we brought you the PELD programming language used in the DECO range. This programming language is particularly interesting not only when automating certain functions but also for programming associated with part families.

For Micro and Sigma machines, we will use the "Personalized Macro" language from Fanuc more commonly called "MACRO-B". Of course, the option needs to be available on the machine to be able to use this language. The example we are going to look at concerns the machining of a kerf with interrupted cutting.



Procedure

The kerf should be made in the following way:

1. Positioning of the tool in Z axis.
2. Fast feed up to external diameter plus a security.
3. Feed up to a cutting depth determined by a parameter.
4. Swarf break back movement to a value determined by a parameter.
5. Progression of feed and back movement up to kerf diameter.

Variables

Two variable families can be used:

1. Variables #100 - #150
2. Variables #500 - #550

Comment: Variables #100 are deleted after a RESET while the contents of the variables #500 remain in memory. In our example, we will use variables #500.

Parameters and variables

First of all, parameters needs to be established to introduce in the variables.

1. Starting diameter	#500
2. Diameter of kerf depth	#501
3. Position of kerf in Z	#502
4. Cut depth	#503
5. Distance of withdrawal to break swarf	#504
6. Feed	#505

Alarm

We will also display an alarm on the machine if aberrant values are introduced in the variables. This alarm will be blocking, i.e. the Reset button will need to be depressed, the erroneous parameter modified and the machine restarted.

An alarm must appear on the screen of the CNC if:

- the starting diameter value is negative
- the kerf depth diameter is less than 1 mm or higher than the start diameter
- the position value in Z is positive
- the cut depth value is equal to or less than 0, or higher than 3 mm
- the swarf break withdrawal is equal to or less than 0

Programme

- The variables and the tests should introduced before the start of the loop, i.e before the N1 line.
- We will introduce the alarms between the end of the loop (M99 P1) and the end of the program (M2).
- All the lines in italics and bold must appear in the program.
- Except for the alarm messages, the texts in brackets are the optional comments designed to facilitate understanding of the program.

Introduction of variables

#500=7	***(Start diameter)***
#501=3	***(Kerf depth diameter)***
#502=-3	***(Position in Z)***
#503=0	***(Cut depth between 0 and 3 mm)***
#504=0.2	***(Withdrawal in X)***
#505=0.02	***(Feed)***

Test of variables

IF [#500 LT 0] GOTO 9900	***(Start diameter negative)***
IF [[#501 LT 1] OR [#501 GT #500]] GOTO 9901	***(Kerf depth <1 or >#500)***
IF [#502 GT 0] GOTO 9902	***(Value of position in Z positive)***
IF [[#503 LE 0] OR [#503 GT 3]] GOTO 9903	***(Cut depth <=0 or >3mm)***
IF [#504 LE 0] GOTO 9904	***(Withdrawal value <=0)***

Explanation of test functions

IF[#500 LT 0] GOTO 9900	If the start diameter is negative, jump to line 9900.
IF[[#501LT1]OR[#501GT#500]]GOTO9901	If the kerf depth diameter is smaller than 1 mm or larger than the start diameter, jump to line 9901.
IF [#502 GT 0] GOTO 9902	If the position in Z is positive, jump to line 9902.
IF[[#503LE0]OR[#503GT3]]GOTO9903	If the cut depth is negative or equal to 0, or if it is higher than 3 mm, jump to line 9903.
IF [#504 LE 0] GOTO 9904	If the withdrawal is negative or equal to 0, jump to line 9904.

(EQ ==> equal to)
(NE ==> different from)
(GE ==> greater than or equal to)
(GT ==> higher than)
(LE ==> less than or equal to)
(LT ==> less than)

Program

```
T0303 M103 S1=4000
G0 X10 Y0;
G0 X [#500+1]
G0 Z#502                    (Position in Z)
G0 X[#500+0.1]              (Start diameter plus security)
#510=#500                   (Loading start diameter in the variable) (#510)
N2
#510=#510-#503              (Calculation of target diameter = Diameter reached less)
                            (the cut depth)
IF [#510 LE #501] GOTO 3    (If the target diameter <= final diameter, jump to N3)
G1 X#510 F#505              (Feed one cut depth)
G1 X[#510+#504] F0.2        (Withdrawal to reached diameter + withdrawal)
GOTO2                       (Return to N2)
N3
G1 X#501 F#505              (Feed to end of kerf diameter)
G4 X0.1                     (Temporization 0.1 seconds)
G1 X[#500+1] F0.3           (Back movement external diameter + 1 mm)
G0 X30
```

Alarms (#3000)

```
N9900#3000=101              (Start diameter #500 negative)
N9901#3000=102              (Kerf depth lower than 1 mm or higher than #500)
N9902#3000=103              (Value of position in Z positive)
N9903#3000=104              (Cut depth negative or larger than 3 mm)
N9904#3000=105              (swarf break withdrawal equal to zero or negative)
```

Explanation of alarm displays

The variable system #3000 contains the alarm number MC3000 to display.

The text displayed following the number must be written in brackets.

The system does not accept accents in alarm messages.

The alarm numbers MC3000 to MC3099 are reserved for Tornos macros.

In the example given below, execution of line N9900 will display the following alarm: "MC3101 Start diameter #500 negative"

Conclusion: If the workpiece to be machined required several kerfs, it would be better to insert the ISO code of one kerf in a Macro (G65) and call up the macro from the main program. We will look into this option in a future edition of **deco**magazine.

COMPETITIVE ADVANTAGES THROUGH A HIGH-PERFORMANCE NETWORK

Decentralized manufacturing strategy and Tornos automatic turning machines – the recipe for success

With 350 employees and around 35 million Euros in annual turnover, the Hutzel Group is one of Europe's leading suppliers with core competencies in precision bar turning and automation. By virtue of an intelligent distribution of competencies and production facilities in different locations, the company is highly flexible when it comes to meeting customer requirements and offers innovative technologies on the global market. The Liebstadt site is not far from Dresden, Germany and is specialized exclusively in the manufacture of precision-turned parts made in large and small series runs on Tornos single and multi-spindle turning machines.

Dirk Urwank, Managing Director at Hutzel-Seidewitztal, makes use of all rationalization options to improve competitivness.

Mr Dirk Urwank, Managing Director of Hutzel-Seidewitztal is proud of his company and the Liebstadt site. The manufacture of precision turned parts and precision engineering have a very long tradition here near Glashütte. Jochen Hutzel, one of the owners of the Hutzel Group, has discovered a very solid foundation here, upon which he was able to set up Hutzel Seidewitztal in 1991. Today, there are around 100 employees and the site is one of the largest employers in the area. It is a key element of the whole group from a technological and economic point of view. In the shadows of the big players, Hutzel has developed into one of the key suppliers to the automotive industry, medical technology and engineering. In this way, the company has made a reputation for itself through an intelligent distribution of competencies at different locations. The corporate departments, process development, prototype manufacturing and production of highly-complex parts are based at the head office in Steinenbronn near Stuttgart.

Other technologies including grinding, lapping and super-finishing and assembly of the complete unit are also based here. The Klasterec site in the Czech

Together they have led several successful projects: Dirk Urwank, Managing Director of Hutzel-Seidewitztal and Frank Mortag, Tornos Technologies Germany.

Republic produces standard turned parts in large volumes and is mainly focused on low costs. Hutzel-Seidewitztal is specialists in precision turned parts and have a reputation in the sector for above-average levels precision and flexibility. Over thirty TORNOS single and multi-spindle turning machines have the lion's share of production capacity at this site. The initial contact with Tornos was made in 1998 when a long deep hole bore operation had to be made for a Bosch fuel injection pump, something which proved impossible to do on the existing machines. The purchaser for this sector, Frank Mortag, and the Tornos technical staff in Pforzheim and Moutier pulled out all the stops and together with Hutzel developed a solution to convince the end customer. The first DECO 20 was delivered in 1998, swiftly followed by five other machines. A further two DECO 26, one Micro 8, two DECO 10 and one DECO 13 were bought, so that there are currently twelve Tornos CNC single-spindle turning machines in operation in Seidewitztal.

Rapid growth also in multi-spindle turning

Almost at the same time as the above project came the increase in multi-spindle technology. After taking over a competitor firm, the Hutzel Group were suddenly in possession of an SAS 16 cam controlled multi-spindle turning machine. This virtually doubled the parts output and operators were able to gain valuable experience in multi-spindle bar turning. The number of parts produced was 5 million from this point on and machines ran virtually round the clock. The high reliability of the Tornos machines really came into play. A radical change accompanied this production organization, which demanded a great deal from the Seidewitztal personnel, but they rose to the challenge and met it in full. Production was mercilessly cut back. All upstream and downstream processing stages were either outsourced or relocated to other locations within the group. "We are in the middle of a huge price competition, both within the group and at an international level", says Dirk Urwank. "In order to ensure the long-term

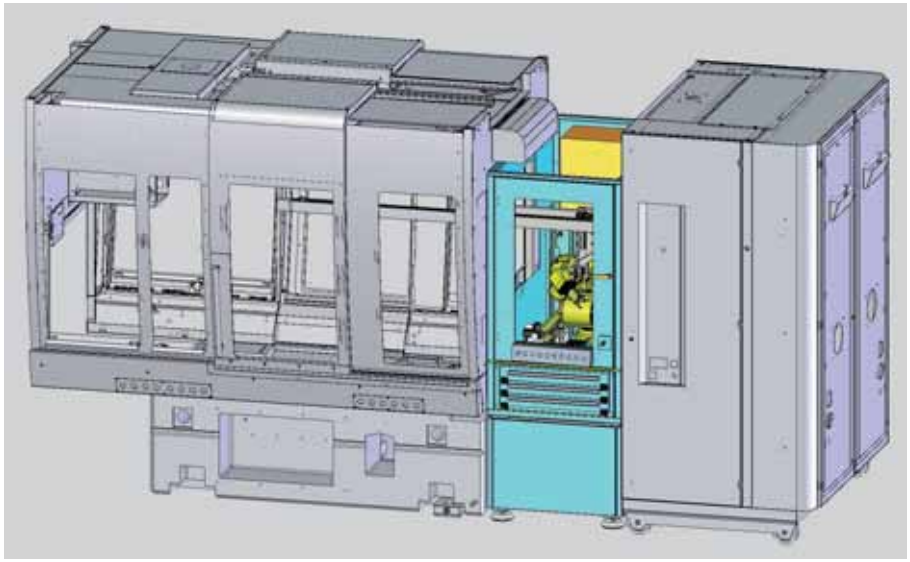
Intelligent organization of production with perfect utilization of space.

Market-specific automation in a confined space.

Hutzel-Seidewitztal employees are genuine professionals and appreciate the benefits of the Tornos machines

future of the site, we have to use all available options for rationalization".

As soon as you look at production, you see that the company has already made good progress in this area. The machines are neatly arranged, closely packed, production logistics is working to full capacity and employees are highly motivated. Despite the high demands, the working atmosphere is informal, friendly and almost relaxed. In general, the personnel work 16 shifts per week, which can go up to 21 if required and each feels a responsibility for quality levels. In return for this, the company also invests a great deal in the training and ongoing development of the employees. Every year, three to five new trainees are taken on at the site and introduced to conventional technologies and above all to the ultra-modern technology of CNC machines in the Hutzel training centre. It works out well that Tornos has



From this concept study, Handling Tech developed a process reliable, perfectly-adapted solution.

Automation cells from Handling Tech.

taken up the cause of improved customer training for some time now and offers training courses in Moutier, Pforzheim or at the customer's location. Because the Liebstadt site can no longer physically grow, Hutzel is putting the emphasis on qualitative growth.

Automation coping with real space constraints

In the spring of 2006, the company received an enquiry for two pairs of parts for a continuously variable 6-speed transmission, highly complex steel part machining with a very low edge tolerance. In order to manufacture such a part, total resistance to knocks/mechanical impact was essential, which was a considerable challenge for the suppliers. The workpieces required precision levels down to a few microns, going right to the limits of the machines' capacity. This level of precision would be jeopardized by conventional component handling with its associated knocks and scratches.

The automatic turning machines are mostly equipped with a manipulator which places the processed workpieces on a chute. The parts then fall into a container. This fall can easily cause damage. For this fall, it is essential that a workpiece holder be used to deposit the parts. Because there was no solution to this problem either from Tornos or from other turning machine suppliers at the time, all parties gave further thought to the problem. To complicate matters, this project had a very tight deadline due to the limited space in Liebstadt; no generously proportioned gantry solutions were feasible. The Hutzel Group that now includes Handling Tech, the automation specialists for workpiece removal and palleting equipment since 1994 for automatic turning machines also became involved. The trio consisting of Hutzel Liebstadt, Handling Tech and Tornos were under a lot of pressure to come up with an optimum solution.

Due to the number of units and the geometrical requirement, production using a CNC multi-spindle automatic turning machine was proposed right from the start. Due to the spatial limitations, the decision was taken by management to go for a MULTIDECO 20/6, which had an extremely small footprint that was to be fitted with the appropriate system. The cells were finally integrated laterally, between machine and control cabinet. With the modules from Handling Tech, an optimum application has evolved from the process. At the same time, when production started, parts were first removed manually in the 3 shift operation and packed on pallets. During this period, the partnership between all concerned really went through a trial by fire. Because this was implemented during a running process, it turned out to be correspondingly complex. Throughout this difficult phase, all those involved including the management

All machines are connected to a central extraction system and operate to high levels of precision round the clock.

of the end customers showed enormous commitment. With a commendable lack of red tape, decisions were taken and solutions were devised and optimized.

In this context, Dirk Urwank expressly praised the good support from the staff at Tornos and Handling Tech, who both went the extra yard with their commitment to this project. After only six months, the process was automated and running smoothly. In the meantime, three more machines using this technology were delivered, so that a total of six similarly equipped machines were manufacturing around the clock. With collaboration of this nature, Dirk Urwank sees great opportunities for Germany's manufacturing base by developing, implementing and stabilizing complex processes. The Liebstadt team has the expertise and the will to do it. In Tornos, they have a partner of the highest order at their side to support them in technology and individual customer care.

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AS SIMPLE AS A SCREW

Is there anything more mundane than a screw? Now freed from the confines of a laborer's toolbox, they are seen every day, in any number of places. Even the medical industry now uses them to repair people as a mechanic would an automobile. It is far from abnormal nowadays to see a doctor with a screwdriver during an operation to repair a broken bone!

Surgeons using parts machined on Tornos machines.

There are several modes of production for screws: single point turning, tapping, and thread milling, along with the somewhat misunderstood thread whirling. Though thread whirling has been around for many years, most of the perceptions of the process are wholly inaccurate.

Surprisingly, even in 2008, thread whirling is still new for a lot of companies. However, a company that works closely with Tornos Technologies revealed that its recent change to thread whirling has resulted in production times that are 26 % faster*.

* In the next issue of decomagazine we will come back on that success with M. Philippe Charles responsible for Medical at Tornos and M. Bouduban, DECO customer and newly convinced by thread whirling.

Examples of bone screws.

DECO 13a by Tornos, thousands of this machine are working day after day in the medical field and a lot are equipped with thread whirling devices.

Example of dental implants produced on DECO 13a.

MultiAlpha 8x20: The first ever multispindle to use the thread whirling process.

More cutters

Year after year, technology changes. Even if the principles of thread whirling remain the same, it would seem that the number of cutting tools never stops increasing. In the late 1990's, a thread whirling head included three or four blades. But just 10 years later, Utilis has introduced thread whirling head with 12 cutters. While the technology may not be new, thread whirling innovation continues, year after year.

Even with programming capabilities, machining by chip removal remains a tricky proposition, especially when dealing with tool-life shortening alloys such as titanium and stainless steel. But thread whirling overcomes these hurdles and is able to meet the wide demand from the medical and dental sectors.

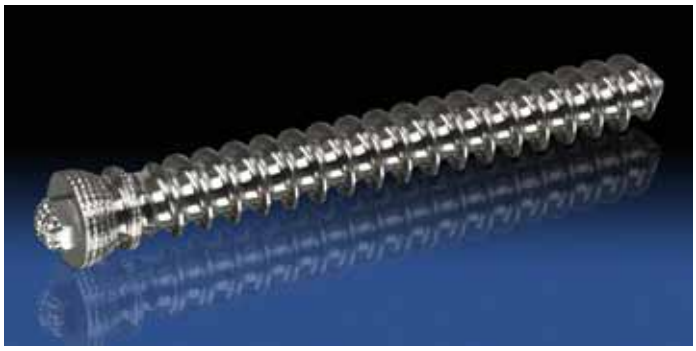
Back to the basics

Tornos has taken the lead in precision thread whirling, adapting itself to the high quality standards required for such applications. Surgeons in the dental and medical fields need implants of all shapes and sizes, including bridges and screws. These parts are made from stainless steel that is recast under vacuum, or titanium. This ensures complete biological compatibility, which prevents any risk of rejection.

The exceptionally high precision required in the production of the intricate screws used in orthodontia or microsurgery stimulated Tornos to improve the potential of its lathes by developing a technique of machining both internal and external threads in a single process. This is carried out either on the bar or in counter-operation on an automatic lathe, requiring a high-frequency spindle capable of turning at speeds of up to 50,000 rpm.

Medical applications

Unlike thread cutting and tapping, thread whirling produces clean contours without burrs. The tools used have a longer life, the machining time is short-



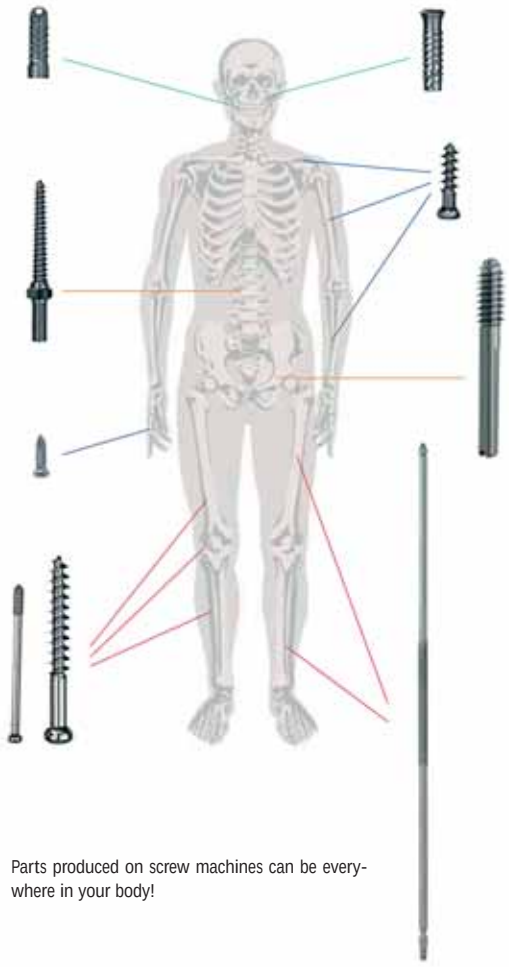
er, and tool breakage is largely a thing of the past. Because of its internal and external threading capabilities, the main applications of thread whirling are bone screws, maxillo-facial screws with external threading, and internally threaded dental implants. During internal threading, the spindle axle must run parallel with the part being machined, while with external threading, the axle is inclined dependent on the desired screw pitch angle. Additionally, the hard metal tool must have a shape similar to the thread profile being executed.

To better understand the needs of the medical implant market, Tornos works closely with specialists in the field as well as experts in tooling, oil, and material production. Comprehensive tests are performed with the help of its partners to ensure that customers going into medical and dental applications are well advised. And what better advice can be dispensed than improving production speed in order to save time and money? That is what thread whirling offers*.

Thread whirling, still a huge potential

Despite thread whirling's inherent advantages, the medical sector is not yet fully equipped with this technology. But recently, other industries – like the automotive and watch making sectors – have grasped that the method can drastically improve both production time and quality. Which comes as no surprise to those already familiar with thread whirling and the not-so-mundane screws it produces.

If you would like more information about thread whirling, please visit:
www.tornos.com or email contact@tornos.com.



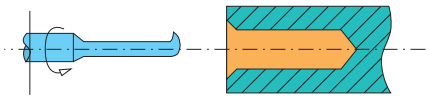
Parts produced on screw machines can be everywhere in your body!

Example of use of thread whirled bone screws.

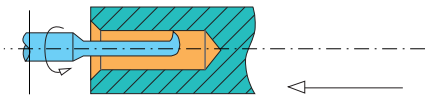
* We will also come back on these partnerships in our next issue.

INTERNAL THREAD WHIRLING PRINCIPLE

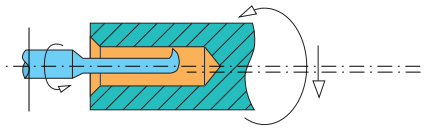
Here is an examination of the machining of an internal tapped hole by thread whirling:



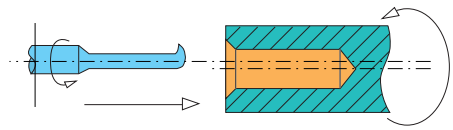
1. The part is presented before the tool, which is turning at high speed.



2. The tool is introduced to the inside by the sliding headstock driving the part.



3. The part turns slowly, either in the tool direction or in the opposite direction, depending on the type of thread being cut (left pitch/right pitch). The tool, which is conveyed by a numeric axis, penetrates the material of the revolving part by lateral displacement. This offset is equal to the depth of the thread being machined.



4. The thread is started at the base of the hole. The thread is executed in a single pass. Both the part and tool are turning. The part is withdrawn at the speed of one pitch per turn of the spindle. This process is 60 percent faster than conventional tapping. The useful life of the tooling is also far superior. More than 2,500 titanium parts can thus be threading without breaking. Coupled with this is the fact that the cutting speed can reach 200 m/min, thus ensuring an irreproachable thread quality. As for precision, this is guaranteed by numeric incrementation, both in depth and diameter. There are no burrs or residual chips and the thread cutting depth can be more than three times the diameter of the thread. It is even possible to machine right down to the bottom of a blind hole or even very small threads, e.g., M 1.4.

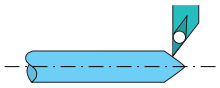
Thread whirling device on DECO 13a.

New Multidec head by Utilis with 12 cutters.

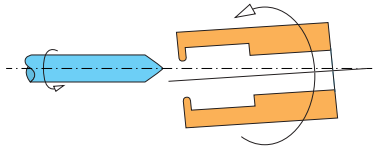
Thread whirling device for multispindle, MultiAlpha 8x20.

EXTERNAL THREAD WHIRLING PRINCIPLE

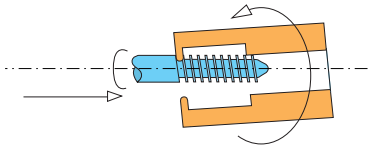
Thread whirling can also be used for external threads. What is required is a high-speed spindle revolving at a speed of up to 12,000rpm and a device that is specially fitted to the end of the lathe that can rotate and incline in relation to the thread-pitch angle. This mechanical inclination is set once manually for each thread line. Machining is carried out using a bell-shaped tool composed of cutters (from three to twelve) of the same section as the thread undergoing machining. This tool may, of course, be resharpened as required. The entire threading depth is executed in a single pass. Here is the process.



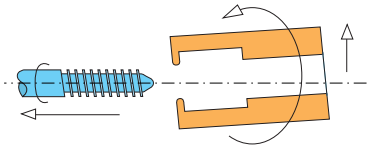
1. The surface facing the part is turned, if necessary.



2. The spindle that drives the thread whirling tool is positioned in front of the point of the part undergoing machining. It revolves at high speed while the part simultaneously turns in the opposite direction at slow speed.



3. Machining can start by longitudinal penetration of the part into the bell-shaped tool. The feed rate, which is synchronized with the two rotation speeds, continues until the required threading length is achieved. It should be pointed out that only one tooth is in contact with the part at any time, thus guaranteeing a fine cut.



4. Once thread cutting of the part is complete, the thread whirling spindle (the tool) is released to the side and the part can be longitudinally withdrawn. This process offers several benefits; the first being the excellent useful life of the tool with its constant contours that can be resharpened up to 40 times. It is also possible to use cutters with reversible tips. Several technologies exist and depend on the thread you would like to realize[1]. The surface finish of the threads is perfect because the tools rotate at high speed in the opposite direction to that of the part, thus avoiding the undesirable lands of the face that are sometimes found with conventional threading by milling. Special features, such as left or right threading, threading from above a screw head or even conical threads can also be achieved because of the flexibility of programming the TB-DECO software and through the multi-axis interpolation of the DECO machines.

[1] In a further article, we're going to go into the details of the various alternatives.

THEY MAKE SURE THE SIGNAL IS RECEIVED, WHATEVER THE CONDITIONS!

What do the following have in common: a rock concert, a Formula 1 team winning a Grand Prix, thousands of air passengers and the 10 key rings to be won at the end of this article?

Rational and efficient, every machine from the DECO 20 workshop is equipped in the same manner.

THE SIMPLE ANSWER

To answer this question, **deco**magazine met up with Mr. Cuenca, Director of LEMO 5 SA in Delémont, Switzerland. The company is located in a leafy industrial estate and houses seven different production groups depending on the types of machine and the facility totals nearly 100 automatic turning machines.

Inside thee ultra-modern workshops, which are currently being extended, an average of 500 tonnes of brass and 20 tonnes of steel are machined every year. All this for the exclusive production of the type of part that answers the above question.

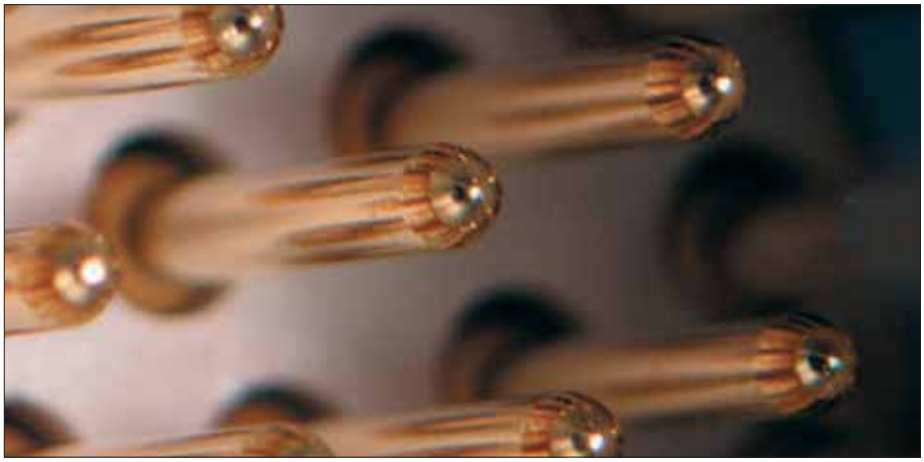
DISCOVERY

decomagazine: Mr. Cuenca, nearly 100 machines produce parts ranging in sizes from 4 mm to 60 mm in diameter, exclusively for one sector, which one?

Mr. Cuenca: We only produce parts for the connectivity business. In contrast to what many believe, this sector is also a major consumer of high technology parts in which Lemo 5 are specialists.

dm: You mention high technology. This is often associated with "innovation". Is this the case with Lemo 5?

Mr. Cuenca: Absolutely. In our sector, competition is fierce and in order to maintain our position as market leader, supplier of quality products, we need to innovate all the time.



INNOVATION

dm: All the same, I have been told that one of the company success stories has been patented since the Sixties.

Mr. Cuenca: Indeed, the patent for the push-pull system which ensures the connections remain perfectly positioned was filed in 1957. But this doesn't prevent us from putting out between 2 and 3 new products each year. They can be small developments but can also be a major new step forward.

dm: Could you give us an example of a new modification?

Mr. Cuenca: This year, we have launched a new push-pull system with pawls turned inwards which is a great step forward for applications in the medical sector.

WIDE RANGE

dm: I presume you have a vast amount of references, how do you manage production?

Mr. Cuenca: We offer nearly 50,000 different compositions based on nearly 14,000 references… It is an extremely wide range. The series we produce are getting close to between 3 and 5000 parts. Certain components are produced in large quantities of rough versions and then only the finish is applied to order.

Preparation of hardware in advance for creation of a new series, with machine downtime reduced to a minimum.

dm: Such diversity surely requires seamless organization, but what about the personnel? Are they "flexible" enough to be able to handle the thousands of references?

PROFESSIONALS WITH A PASSION

Mr. Cuenca: We have set up a simple and direct organization, we operate within a flat hierarchy and our expertise is continually updated. In human terms, we share a genuine passion for the quality we offer our customers.

Our machine operators receive in-house training over a period of 2 to 3 years in order to become "Lemo setters". We attach a great deal of importance to this aspect, which makes all the difference. Our machine park mainly comprises Tornos single-spindle turning machines and the faultless knowledge of Tornos is a guarantee of success.

dm: Am I right in saying you have recently been working with a multi-spindle turning machine?

Mr. Cuenca: Yes, we have a MULTIDECO 20/6 in production, machining simple parts and we have a MultiAlpha turning machine on order, which is going to replace the SAS machines producing blanks and transfer centres finishing the parts. The main challenge has been to find a solution to replace the old processes. This is always a source of risk because parts were reworked, with the same productivity.

dm: We have talked a lot about production… do you carry out other activities at Delémont, how are you organized?

Mr. Cuenca: Lemo 5 is part of the Lemo group and works exclusively in the production of parts for the parent company. Within this context, our trade is bar turning, but we also have injection, washing and processing departments.

dm: You mention the Lemo group. Can you tell us a little more about it?

Mr. Cuenca: The Lemo group was founded in 1946 for the manufacture of coaxial connectors for the Swiss "PTT" (Post, Telegraph, Telephone). Since then, the company has grown and grown and now has 1100 employees in 80 countries.

dm: With over 1000 people in the group, how many employees do you have in Delémont working for Lemo 5?

Mr. Cuenca: There are nearly 250 people working here and there are always about 6 in training. Of these 250 people, only 20 are "unproductive".

dm: You are therefore exclusively a production company. You don't have any marketing strategies to make you stand out in the market. What, in your opinion is your main strength?

Mr. Cuenca: First of all, it's the products we make. Lemo products are quality products, the market benchmark. We therefore benefit from the marketing carried out at group level. With our quality products, we play a part in the construction of the "Lemo product".

The new Sigma 20 workshop, the perfect complement to the DECO 20a.

In purely production terms, we bring the best out of high-performance machines and highly-skilled personnel. We all have a passion for our product and it is this that determines everything we do. At each stage of the production process, we know that a customer will be satisfied with the Lemo performance.

EXTRAORDINARY PRODUCTS

dm: You are specialists in the connector business. We can sense a certain pride in the way you talk about them. What is so special about them?

Mr. Cuenca: If it wasn't for Lemo, millions of football fans would be deprived of Euro 2008!

The HDTV connectors we produce are used by all sectors of the television sector. But that's not all. Our connectors work perfectly in extreme conditions, in undersea exploration at depths of 600m, in geostationary satellites up in space, at 200 degrees below zero in liquid nitrogen or at +360 degrees in industrial ovens. Lemo ensures perfect connections in extraordinary conditions.

dm: You have many Tornos machines. Why did you choose this manufacturer?

Mr. Cuenca: The DECO machines enable us to make the parts we need in the required series volumes. They are flexible and the programming system provides us with total freedom. These machines are mastered to perfection by our setters and operators. In this way, we benefit from the added value these production methods provide.

dm: Thank you for your time Mr. Cuenca.

An operator on the DECO 13a has his own workstation. Yet more proof that bar-turning is a very modern profession!

THE LEMO GROUP IN FIGURES

Company founded by Mr. Léon Mouttet in 1946

Production sites:	3 in Switzerland 1 in Hungary
Employees:	1100, of which 200 in Delémont
Lemo 5 founded:	1975
New extension in May 2008:	2720 m^2
Total surface area in Delméont from May 2008:	9400 m^2

THE FAMOUS LEMO PUSH-PULL CONNECTORS

To enable the fastest amongst you to 'get your hands' on these connectors, **deco**magazine will send a 'Lemo' key ring to the first 10 readers who send an E-mail to the Editor's blog at the following address: decomagblog@hotmail.com

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AN ERROR OF INCALCULABLE CONSEQUENCES

1952, the film "Singing in the rain" is on American movie screens, the inaugural particle accelerator is switched on in Saclay in France, the first contact lens is worn in the United States, new developments see the light of day in the fields of aeronautics, automotive, science… and in Evilard, a bar turning company was about to embark on what was to become a revolution!

Mr. Lechot in front of one of the renowned P4 units (no longer in use today).

The 24 Petermann P4 machines manufacture balance wheel axes for the watchmaking sector. Production at the time is already strong and requires round the clock production. Bars are loaded on to the machines and depending on the length of the workpieces, autonomy levels do not exceed 8 hours. For this reason, the company employed a particluar Mr Conrad to supply the machines every evening at 10 o'clock.

That night was no different to any other. The 24 machines were running like clockwork, 22 were loaded with diameters of 1.3 mm and the remaining 2 with 1.4 mm. As usual, the operator loaded the bars and for a reason that was to remain unknown, all the machines were loaded with a 1.4 mm diameter…

One tenth which was to change the world!

On the same date, Marylin Monroe caused a stir with a calendar where she revealed (nearly) all … but this is another story. Erwin Lechot was the first to arrive on the scene that morning and a terrible discovery awaited: 22 machines had already stopped, the guide bushes jammed and the remaining burins broken in the workpiece recovery trays. Having got over the initial shock and with production up and running

again, Mr Lechot turns things over and over in his head: why not avoid this kind of error with a robot? Even if the film "Forbidden Planet" and its famous robot (Robby) had yet to be made, modernism was everywhere.

Agreeing with Mr Conrad, Mr Lechot got to work, gathering material, brass tubes, accessories… but some elements were missing in particular a small chain, small but strong. It's finally in a toy shop where this chain was found. The famous mecano set also provides the miniature screws and other small mechanical parts.

They then came up against problems with the motorisation, which needed to be stopped to bear the return of the headstock, without overheating. Fortunately, a local manufacturer was able to help out here. Mr Lechot was sure his idea would work. Every day he would test his solutions, improvised the features. Exiting the scrap in particular is a real headache as the motor is not powerful enough for the rod system to multiply the movements. But the hardest part for the inventor was the scepticism of the company's other bar turners who believed such trials to be unproductive. To be able to work on the project in peace and quiet, the decision was taken to run the tests at night. After 10 pm, when it was just them and the machines, Mr Lechot and Mr Conrad assembled their equipment, night after night, week after week, month after month.

The reward

After more than two years of research and development, and without penalising production, the solution worked, the very first automatic[1] bar feeder in history saw the light of day. With the help of one of the region's mechanical firms, the entire Conrad workshop was equipped and it worked! Such an invention deserved to be shared! Messrs Conrad and Lechot offered it to Petermann SA who turned them down. "We just knocked on another door" Mr Lechot explains.

It was the time of first forays into space and for the first visit from the Tornos management, the loader was adorned with a plaque bearing the name "Sputnik". A wonderful name for this inseparable companion of machines[2].

The invention's potential was rapidly understood by Tornos who bought it and three M7 machines for SFr 100,000 a very good price for the time!

A few months later, Tornos presented this new piece of equipment at the Basel trade fair. Everything was streamlined and secretive but in working order! Thus the automatic bar feeder was born and it went on to enjoy the development we all know about. Without this error from 1952, what would the world of bar turning be like today?

The virus of mechanics and invention

We could have left it at that, but the story did not finish here because Mr Lechot, our genius inventor, decided to found his own bar turning company in 1965. 40 years later, he is still there, with a twinkle in his eye whenever we mention mechanics and when the topic of his retirement comes up, he admits to having thought about it. He admits to having done 10 years of overtime. One of Mr Lechot's regrets is not having had the opportunity to keep one of his prototypes. It could have taken up position in the Swiss-type Automatic Lathe Museum in Moutier.

---

[1] Known as loader at the time!

[2] Sputnik means "travelling companion" in Russian.

REPLACE PRECISION GROUND MATERIAL... AND A LOT MORE BESIDES!

New machining technologies from Walter Dünner SA.

Are you faced with the following problems?

- marks or scratches on workpieces?
- material with an irregular surface?
- precision grinding by supplier or subcontractor takes too long?
- vibrations during milling operations?
- reduction in feed due to material retreating?
- difficulty finishing workpiece on the machine due to a problem of diameter?

DECO 20/26 3-position rotary guide bush.

There is now a solution to most of these problems.

In many cases, when material retreats in the guide bush at high speed, an effective pressure increase on the material occurs. This has a negative influence on the quality of the workpiece finish because a superficial "coat" can appear. The NewSurf ceramic guide bush is an ideal solution to this problem. The coefficient of friction for ceramic is six times lower than that of hard metal. Very careful attention needs to be paid. However, the guide bush adjustment must be set "dry" and if the NewSurf guide bush is adjusted with lubricating fluid, it will be overtightened right from the start.

Double-cone flexible guide bush.

LongStar clamp.

The rotating guide bush presented at EMO 2007 in Hannover is currently available on the DECO 20/26. This rotating guide bush provides a solution to many problems concerning scratches, differences in material diameters, material precision grinding time and vibrations during milling operations.

It is time to explain. The guide bushes used inside this rotating guide bush are different to those more commonly used. They are double cones and feature parallel clamping along a length of 40 mm. This guide bush has been designed to be torsion-resistant. This way, the usual concentricity of standard guide bushes is maintained. Given that the double cone guide bushes are either in hard metal or special bronze they enable a choice to be made, depending on the materials to be machined.

The 40 mm guide length and the choice between the guide bush in bronze or hard metal also solves the problems of scratches and marks on the workpieces. In addition, fitted to the rotating guide bush, these guide bushes offer three programming modes: guiding, clamping or opening.

In the guiding function, they are capable of handling different material diameters up to 0.50 mm, while maintaining precision levels. This controlled flexibility via CNC gets round the problem of very deformed materials. Pre-machining on the material by rotating 0.2 to 0.3 mm in diameter, material retreating, guiding on rotated diameter (lower diameter) and producing the final workpiece in a tolerance, which is just as good as precision ground material are all possible.

In the opening function, the bar can be ejected or material offcuts can be removed completely for replenishing and a new bar can be introduced more easily.

In the clamping function, sectioning or milling operations are extremely efficient, providing unrivalled stability in order to achieve excellent results.

The problem of material sliding in the collet can be resolved at no additional adaptation costs with the LongStar collet. This "F" type collet has been designed to handle considerable differences in diam-

eter (0.50 mm) and particularly to increase the clamping force. This LongStar collet is reduced to the head of a standard collet, its three segments are connected by vulcanized rubber. This structure ensures parallel closure of the three segments using a closing force well below the force required for a standard collet. The rubbers provide a spring action while ensuring a perfect opening and the collet spring housed in the casing is no longer used. By applying a central force, like during a drilling operation, the pressures of the jaws on the machined material is increased multiplying the clamping effect.

When used on sliding headstock machines, this collet has proved its effectiveness in many areas. When used on fixed headstock turning machines, the rubbers prevent swarf form going inside the casing. A clamping range of 0.5 mm means many collets can be saved for intermediary boring.

When it comes to reworking workpieces of different diameters, a "large aperture" collet can be used.This collet enables a larger diameter to be clamped (e.g. a threaded workpiece can be placed in the collet and clamping done after the thread on the release diameter). A robust design, this type of collet enables screw heads to be swaged.

Aware of the problems associated with reworking, Tornos have developed, on the latest versions of their machines, an upper piston stroke enabling the creation of the Dunflex collet. This enables clamping a diameter with a difference of 2 mm from the original diameter of the collet. This new design allows work to be done with standard casings for "F" type collets.

Fully aware that all the problems that customers find, this can not be solved with the mere description of the above solutions, Walter Dünner SA encourages you to visit www.dunner.ch

Wide aperture clamps.

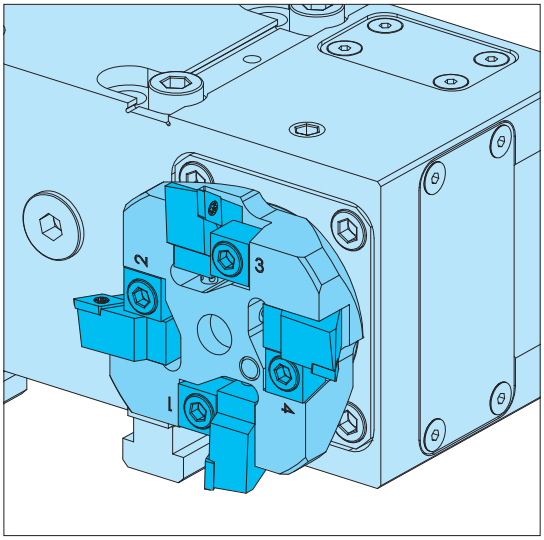
Dunflex clamp.

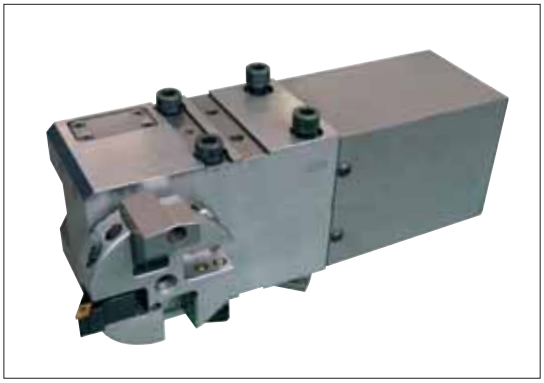
SAVING CYCLE TIMES ON MULTI-SPINDLES!

Multi-spindle turning machines are already reputed for being a must in terms of productivity. How do you go even faster?

With a tool holder turret for Tornos multi-spindles! Thanks to this new option for MultiSigma and MultiAlpha, you can enjoy enhanced distribution of your machining operations, change tools automatically after a predefined number of workpieces and thus increase autonomy or even work with a six-spindle turning machine as if you had eight spindles at your disposal.

Miraculous? No - Technological!





Option number

This option has not yet been accorded a number. If interested, please contact your usual Tornos dealer.

Operational principle

A tool holder featuring a turret takes the place of a simple tool holder, therefore offering the option of fixing four tools instead of a single one on the position in use.

Strengths

- Option of fixing three turrets per eight spindle machine and two on six-spindle machines. This operation multiplies the machining possibilities.
- Possibility of fixing twin tools to increase efficiency.
- The turret can also be fixed in counter-operation position on a MultiSigma, doubling the machining capacity in this position. Four tools instead of two!
- Enables a more well-balanced cycle time on the different positions.

Technical specifications

Simple programming using: TB-DECO.

Rotation of the tool holder head: pneumatic.

Compatibility

MultiAlpha and MultiSigma models.

Availability

This option is available ex-works immediately.

Comment

The position of the turrets must be defined in TB-DECO and on the machine control unit.

THAT DECISIVE CONCEPTUAL STEP FURTHER

Short process for more than 10, 000 burr-free threads per tool. In implant technology, the key requirement is ultimate precision during the machining of challenging materials such as titanium. One process employed in this area is thread-whirling.
This tool concept is one which Zecha Hartmetall-Werkzeugfabrikation GmbH from Königsbach-Stein, Germany has gone on to optimize and is now setting entirely new standards in terms of precision and service life. The official entry of a German Trademark [Deutsches Gebrauchsmuster] underscores the innovation inherent in this new series of tools.

Implants manufactured to the highest quality standards are vitally important for the success of dental procedures. Zecha Hartmetall-Werkzeugfabrikation GmbH, based in the German town of Königsbach-Stein, is a manufacturer of high-quality precision tools and has over 40 years of experience in micro-production. The company has now achieved decisive progress through a small but highly significant modification to the thread-whirling concept. This specially shaped T-groove type of milling tool is used primarily for milling threads on tooth implants.

Disadvantages eliminated

The manufacturer of implant posts - the connecting element between a synthetic tooth root and an implant – lays down clear specifications: Internal threads to be shaped in an absolutely cylindrical manner with total contour integrity. The best way of achieving this is to use thread whirling units equipped with only one cutting plane. This makes it possible to combine maximum precision within a very confined space with absolute reproducibility and surface quality. Bernd Kirchner from Technical Sales, involved in a key capacity in the development of these products, has this to say: "We took a very careful look at established thread whirling designs and analyzed the disadvantages of single and double-bladed variants. Since neither concept delivered convincing standards of cylindricity, we continued to scrutinize the process. Then, through modification of the tool geometry on one plane, we succeeded in eliminating the disadvantages of other tool variants."

Optimum quality, less inspection work

To date, a major shortcoming has been that we have not been able to manufacture threads that remain perfectly free of burrs throughout the service life of a thread milling tool. This resulted in the need for a great deal of inspection work and expense. For this reason, other tool developers have been experimenting with multi-pass variants – but here too, they encountered disadvantages: As soon as the tools started to exhibit the slightest levels of mechanical wear on their first blade, the threads produced could not be utilized right through to their final thread pass. Once again, a high level of post-production inspection work was necessary.

Tool technicians from Zecha found a way out of this dilemma through an extended geometric reshaping of the thread-whirling profile. This blade shape, with a defined minimum radius, now enables us to manufacture threads entirely free of burr formation to the highest standards of quality and with a correspondingly low requirement for inspection. These threads can be used right down to the final coil at the base of blind bores. Stefan Zecha, CEO of Zecha: "We took the single-bladed tool as our starting point and developed an optimized variant which has none of the restrictions of tools otherwise available on the market. By virtue of our many years of experience in micro-machining, the new Series 462 achieves roundness precision of 0.003 mm and dimensional accuracy of 0.010 mm. This is precisely what practitioners were demanding from us."

The company is especially proud of the fact that this new tool concept has now achieved official German Trademark status – a further indicator of the uniqueness of this development.

However, the tools in this new series of thread-whirling devices deliver yet more benefits: They shorten process times because they shape the threads reliably in a two-stage operation – roughing followed by finishing. The polished surfaces possess superlative surface quality and this contributes to the exceptional sharpness of the cutting blades. These ultra-sharp blades are the key to high levels of stock removal – which can be sustained over much longer periods of time than was previously the case. You see, compared to the thread-whirling tools used previously, and subject to optimum conditions, tool service lives can now be extended to production output levels in excess of 10,000 threads.

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REPEAT SUCCESS...

A piece of equipment is a real success on one type of machine so you would like to use it on another! However, this is not always possible but evolution is possible.

In this edition of **deco**magazine we discuss two very popular options that are available on other machines.

- The small dimension cutting unit on the DECO 10 is now presented on the DECO 13a enabling customers already equipped with this kind of machine to increase the scope of operations open to them.
- Vacuum removal system on the DECO 10. Used on thousands of set up units on the Micro 8, this removal unit is ideal for very small workpieces and is now available on the DECO 10a.

HIGH PRECISION CUTTING FOR SMALL DIMENSIONS

Ø 8 mm

Application

This unit is designed for finishing workpieces on the automatic turning machine, removing the need for reworking on other machines.

Benefits

Avoids secondary operations on workpieces.
Guaranteed concentricity between cutting and boring (for example).
Time savings and reduced floorspace requirements.
Greatly improved output.

Technical specifications

Principle: gear hobbing.
Max module: 0.05 to 0.4 mm.
Rotation precision: < 3 m.
Adjustable screw angle: +/- 4°.
Tool-holders: brackets for milling tools Ø 10, 12, 16 and 18 mm.

Compatibility

DECO 13a and DECO 13e.

Availability

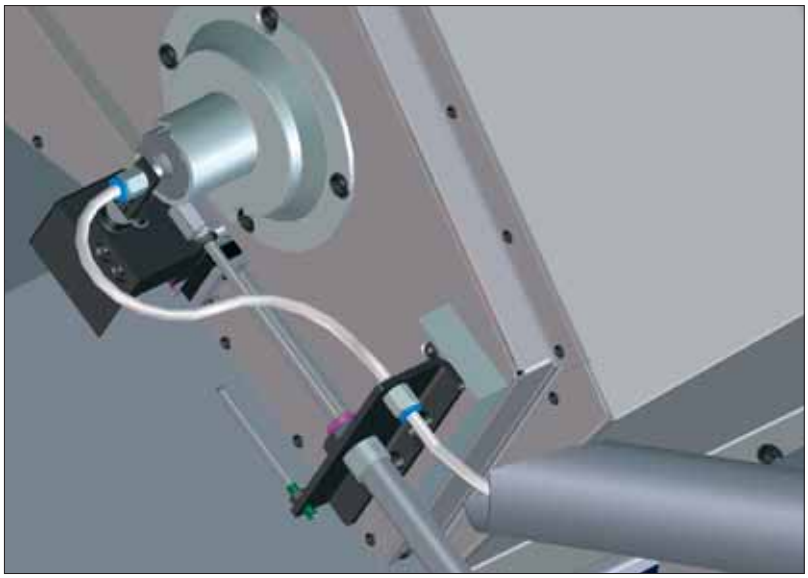
This unit is available immediately ex-works and also as an option for machines already set up.

Comment

The gear hobbing principle for very small diameters is already a feature of the DECO 10, the application for the DECO 13a and the DECO 13e is presented on a "watchmaking" part during Siams 2008.

For more information on this unit, don't hesitate to contact your usual Tornos representative or contact the editorial office who will forward your request (redaction@decomag.ch).

VACUUM REMOVAL SYSTEM



Application

The recovery of very small parts can be problematic, a 'simple' aspiration system at the time of cutting (operation) or unclamping (counter-operation) means the machined workpiece can be recovered in a cup filled with fluid.

Benefits

All workpieces are recovered and transported in total safety towards the recovery tray.

Being filled with fluid means there are no collisions between the workpieces.

The recovery system is available in a two and eight-cup version on a carousel. The exit parameters (change of cup) is determined by the choice of the operator.

Technical specifications

Max. workpiece size: Ø 3 mm, length 6 mm.

Vacuum pressure: -0.7 bar.

Size of recovery trays Ø 50 mm, height 90 mm.

Compatibility

DECO 10a/10e (Micro 8 and Micro 7 variant).

Availability

This unit is available immediately ex-works currently under special development and also on request for machines already set up (CN 16itb only).

Comments

Recovery of workpieces at counter spindle replaces standard manipulator.

Recovery of workpieces at the guide bush uses false positions T14' or T24' (lower positions on combs 1 or 2).

For more information on this unit, do not hesitate to contact your usual Tornos representative or contact the editorial office who will forward your request (redaction@decomag.ch).

GUERRINI S.p.A.
A REALITY IN THE HEART OF ITALY

Many years ago, in September 1962, Mr Valerio Guerrini decided to change career to become an entrepreneur in the Marches, a central region of Italy, where industry was just beginning to develop.

At the time, the Marches was already a region which was well-known for the production of accordions (Soprani), small domestic appliances (Lenco) and electrical equipment (Ticino, Elios, Ilme). Demand for the production of very small high-precision turned parts was ever increasing.

Mr Valerio Guerrini, in his twenties, was in the middle of an apprenticeship with a small sub-contracting firm. He quickly understood what the market required and decided to take up the challenge by setting up his own workshop. Today, 45 years later, the company which bears his name is at the top rung of the ladder, not just in Italy, but on a European scale.

Tornos automatic turning machines were in operation during this period, specially made and reserved for the production of turned screws used exclusively in the region's industrial products, but Mr Guerrini, in tune with future development, quickly grasped where the interest lay: in expanding his activities to cater for all high-precision automatically bar turned products. This intuition was the foundation stone for the current success enjoyed by Guerrini S.p.A. as well as a first for the region, which is now home to at least four of the largest Italian automatic bar turning companies!

Thanks to considerable financial investment, the first two sliding headstock turning machines were bought, providing access to a rapidly expanding market, the market for small bar turned parts.

In a period of strong growth, the market grew sharply from the beginning. From then on, the goal was above all to "catch the train" of quality and precision required for the products demanded.

For Mr Valerio Guerrini, it became immediately clear that large amounts of will and professionalism did not count for much if not backed up by suitable means of production. So it was with this in mind that Tornos supplied the up and coming company Guerrini had created with its first high-precision turning machines.

For many years, Tornos would come to represent one of the essential foundations of the Guerrini company. As time went on, and continuing today, the collaboration between the two companies helped provide continuous energy, while allowing the company to develop.

Family picture, M. Guerrini with his three daughters and sons-in-law.
From left to right: Silvano Cittadini: factory manager, Panina Guerrini: quality control, Valerio Guerrini: CEO, Sylvia Guerrini: head of marketing, Giampaolo Giacché: head of sales, Antonella Guerrini: reception, Maurizio Tavolini: head of production.

In the years following the company's creation, the Mr Guerrini's passion would remain in the family genes. This explains how his three daughters, Antonella, Panina and Silvia, joined the company, as did their respective husbands, Maurizio, Silvano and Giampaolo, all now successful in their strategic positions within the Guerrini company, now a limited company

Guerrini today

What was once a small company in Numana, on the shores of the Adriatic, with its two turning machines, now has its head office in Castelfidardo in a newly acquired site covering 7500 square metres.

It employs 80 members of staff and has a park of 110 machines on the cutting edge of technology including 65 sliding and fixed headstock turning machines, 15 secondary operation machines and 8 machines for the assembly of small electrical components.

As far as Tornos machines are concerned, there are 30 cam-operated and CNC single-spindle turning machines, as well as three multi-spindle SAS 16.6. Tornos has played a very important role in Guerrini S.p.A's success and continues to do so today.

Other fixed headstock machines from Index, Eubana and transfer machine from Wirth & Gruffat have also contributed to this success.

In order to get a better idea of the position held by Guerrini in today's market, I put several questions to its current President, Mr Valerio Guerrini.

E. Pitton: Which market sectors does your company target?

Valerio Guerrini: Due to the fact that we produce parts to order, based on customer designs, we are not limited to the market sector for which the parts are designed. Currently, the type of activities covered by our production concern industrial electrical equipment, which today represents 25 % of our turnover, the automotive sector is growing sharply, pneumatic and hydraulic sectors, gas, electronics, as well as component sets.

EP: What are the main materials you currently machine?

VG: Currently, we continue to machine brass and steel, in equal amounts, 50 % in each.Brass is used for production we continue to carry out today on Tornos sliding headstock cam-type machines and mainly on machines working for the electrical sector. It should be pointed out, though, that the ever-increasing demand from the automotive and pneumatic sectors increasingly require the use of tough materials which are difficult to machine.

EP: How do you intend achieving the productivity and quality levels required for today's market?

VG: Our company is continually on the look out for production methods on the cutting edge of technology. We have always believed in the value of extensive dialogue and a close partnership with the major machine-tool producers. As far as we are concerned, Tornos and Index are the "major players" but we do remain very open to new productions which would extend our scope of technology and therefore also our productivity.

EP: Does the ever-higher demand for levels of precision in materials which are extremely difficult to machine not cause problems?

VG: Guerrini S.p.A. is ISO 9001 certified on the market, which sets the company's productive process apart. The ability to create synergy between human resources and production methods, which has always been the basis of our company, enables us to provide a declaration of conformity for the production process, should the customer request it. Machining is under constant surveillance and controlled by modern systems collecting data which is transferred to a quality control equipped with the most up-to-date end product inspection equipment.

EP: What kind of criteria and internal directives are needed to achieve these results?

VG: First of all, a detailed and meticulous analysis of customer needs and requirements. Then implementation of the product on a production system to achieve a result which is cost-effective both for the customer and our company.

EP: In that case, what determines the choice of production and control systems as far as investments for Guerrini S.p.A are concerned?

VG: Guerrini S.p.A., and in particular its President, have always held human values and relations with third parties in high esteem. this applies to their own personnel and partners including, of course, their most important suppliers. therefore, the choice of a

production system, of a machine-tool, for example, will always be the result of consultation agreement between production managers and corporate management. The main criteria to be taken into account are, in order: precision, reliability, ergonomics for ease of use, assistance, spare parts and finally the collaboration relationship proposed by the supplier.

EP: What was the main reason for choosing Tornos?

VG: We started out in 1962 with two machines which were not from Tornos, but we realized very quickly that Tornos represented the main basis of our company and that a large part of our success was due to the long years of collaboration between the two companies. the machines are our guarantee, today as in the past, of high levels of precision associated with high quality levels, ease of use as well as reliability and sufficient technical support for spare parts. However, the main reason for bringing Guerrini S.p.A. and its founder and Tornos together is the constant collaboration in "know-how" which has always been based on sound and sincere human relationships.

E. Pitton
Tornos Technologies Italia S.r.l.

THE SAME WAVELENGTH...

The world of industry occasionally reserves a few surprises! Companies come together, partnerships are formed and sometimes we wonder why. On other occasions, the reasons seem more obvious and the result is logical.

The announcement of the integration of Almac into the Tornos group comes under this second statement, but in order to get a better understanding, we went to talk to Mr Roland Gutknecht, CEO of Almac. Then, to Mr Raymond Stauffer, CEO of Tornos to complete the picture.

decomagazine: Mr Gutknecht, Almac is thriving company. Why this amalgamation?

R. Gutknecht: Today, Almac is a sound company with a turnover of SFr 17million. The shareholders have contributed to the development of the company and have expressed the desire to tackle new challenges. The offer from Tornos has come at just the right time. It is an "industrial" offer that we appreciated a great deal more than a simple "financial" offer.

Several parameters were analysed on both sides in order to determine if this rapprochement was the right one and different factors contributed to the success of this operation.

First, we are two Swiss companies conducting the same kind of activity. We provide machining solutions for very precise small parts with high productivity levels, Tornos in the cylindrical field, Almac in the cubic. Secondly, we work in the same markets –

watchmaking, micromechanics and the medical sectors. We are therefore familiar with the same kind of demands and our ways of operating are quite similar.

dm: What are the advantages of this for your customers? Aren't you running the risk of Almac being "swallowed up" by Tornos?

R. Gutknecht: As far as our customers are concerned, this rapprochement enables us to offer a complete machining solution for cubic and cylindrical parts. Of course this creates synergies, whether at a technological, distribution or marketing level, but Almac keeps its identity.

dm: You mentioned synergies. Can you expand on this?

R. Gutknecht: Synergies are very important at all levels. To give you an example, ten days after the agreement was signed, three Tornos technicians in Chaux-de-Fonds were already working on a way to help us reduce our lead times. In purely technical terms, take the "fashionable" linear motors – if both companies are working on such a project, why not combine such elements?

dm: How do you intend to proceed?

R. Gutknecht: The management plans are still to be defined. We have just signed the agreement. Give us a little time.

dm: Coming back to synergies, you mentioned distribution and marketing. Can you tell us a little more about this?

R. Gutknecht: Tornos is providing us with access to its entire commercial network, both at a geographic level throughout the entire world and at a market sector level, including medical, electronics, automotive etc. The entire Tornos global commercial network is joining forces to represent us as soon as the agreement is signed. Suddenly, the global range has filled out and become more attractive for our

customers. During a Tornos customer visit, a complementary Almac solution can quite easily be proposed. Customers often require several types of production machines.

dm: Is this not a contradiction? You are requesting resources from Tornos to reduce your lead times but at the same time you are looking for business to "take off" internationally. What are you going to do if the demand grows exponentially?

R. Gutknecht: It is during a period of high economic growth when you need to build for the future. If we wait until our sales fall before finding solutions, it will be too late. We work in a cyclical industry and even if the workload we receive from the watchmaking sectors (our main market) seems to remain at a relatively high level, there is always the risk of a downturn. If, as you say demand increases sharply, we will be part of a group which is very well equipped with competent personnel. We will have a good potential for reacting to demands.

dm: In your opinion, what are Almac's strengths currently?

R. Gutknecht: There is the technical side of things, naturally, but before that I'd say the willingness to listen the customer and therefore have a perfect grasp of their needs to offer the production means possible. A large part of our current customer base comprises watchmaking factories and our personnel have the same origins. We understand each other "instinctively".

dm: If you develop tailor-made solutions depending on the requirements of your customers, mainly for the high-end sector, you are clearly in a very restricted niche. How do you combine this with an industrial rationale?

R. Gutknecht: Our range is very flexible. We have five lines of machines on which we can fit 3 types of different slides. In actual fact, we are equipped with virtually all existing features to meet the needs of the customer. It's up to us to combine modularity to end up with the product expected.

dm: Talking of distribution and strategy, are you not worried about developing internationally at the expense of your local customers? If you need to continually "make up" new machines, would you have the resources?

R. Gutknecht: We are equipped with an engineering department with ultra-modern tools and we have an excellent capacity for reaction. This is an issue, however, and we are not going to develop "at any price" by penalising our existing customers. That's for sure.

CU 1005

GR 600

CU 3005

dm: Coming back to your strengths, to what extent does this concern your products?

R. Gutknecht: Our customers highlight different points, mainly the precision of the finished part and the option of finishing the part on the machine. These are two elements where we are "identical" to Tornos.

dm: You mentioned the medical, watchmaking and mechatronics sector, but your customer base is mainly in the watchmaking field?

R. Gutknecht: Exactly! We have focused on our main customers through lack of sales resources. A few years ago, we had an agent in Germany for whom our "precision – appearance – finished parts" concept was a great success. Unfortunately, our agent no longer works for us. We are now very pleased to again be able to offer Almac solutions in Germany through the Tornos network.

dm: Are there any trends within your sector?

R. Gutknecht: As in many sectors of industry, series volumes are going down. While our customers would produce millions of similar parts a few years ago, they now produce small series but still on an industrial level. We have gone through a real transformation in production. The machines have followed or anticipated this movement. To give you an example, parts once machined on horizontal transfer machines by their millions every year were then produced on vertical machines at a rate of 60 to 70,000 parts per year and are now machined on automated and flexible machining centres at a rate of 8 or 10,000 parts per year. It's a fundamental change.

dm: Is this flexibility backed up with simple programming?

R. Gutknecht: All our machines feature standard Fanuc or other types of programming systems depending on the range. In most cases, our customers use CAD/CAM systems. Besides, we have an agreement with Alphacam.

dm: These days, it's often said that innovation is key for any company. What about Almac?

R. Gutknecht: The first innovation is our modularity. For example, on a "700" base, we can create machines with 3, 7 or 8 axes, machining centres, bar centres, diamond machines or dial drills. We innovate to find dedicated solutions, but we also work on products for the future.

dm: How are you positioned in relation to the competition?

R. Gutknecht: Of course, we actively follow com-

Micro 7

Micro 8

Sigma 20

petitive activities… every manufacturer will tell you that their products are the best, that's fair enough. I can reply by saying that our customers are very satisfied with the precision and quality gains we can offer them. Finally, what counts is that our technology and innovation serves our customers.

dm: To go back to the acquisition of Almac by the Tornos group, do you think the "Swiss label" is still a plus today?

R. Gutknecht: Being a Swiss company definitely has potential but "Swiss made" alone is no longer enough. This needs to be backed up with the facts!

dm: The "Swiss made" label is often also associated with a sort of "excess-quality", certainly very attractive but also very costly.

R. Gutknecht: The demands on quality and precision actually never stop growing. The "excess-quality" on production is not an issue. As far as our products are concerned we correspond to the demand!

dm: In terms of distribution and marketing, you have also spoken of synergy and mentioned Germany as an example. How do you see things?

R. Gutknecht: It's very simple! We are both on the same wavelength. We target the same customers or the same type of customer… we can only be more efficient. For example, we presented a Tornos machine (Micro 7) on our stand at Baselworld because Tornos was not exhibiting… a great success. We will be attending many exhibitions on neighbouring stands and sometimes together. Once again, for our customers it's a simplification.

dm: You sound very upbeat about the integration…

R. Gutknecht: We understand each other, are entrepreneurs and are interested in collaborating.

The future is what you make of it, and it's positive!

dm: Thank you very much and we'll let you have the last word.

R. Gutknecht: Almac is particularly well-known for its quality products and listening to customer needs. Our integration into the Tornos group will enable us to develop this aspect at an international level, but we are conserving our strengths and our distinctiveness.

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INTERVIEW EXPRESS: WHY ALMAC?

To shed new light on the words of Mr Gutknecht, we met up with Mr Stauffer, CEO of Tornos.

decomagazine: Mr Stauffer, why this acquisition?

R. Stauffer: Although Tornos automatic turning machines are able to produce very complex parts, they have certain limits when it comes to manufacturing even more elaborate parts. The manufacture of such parts requires the services of a machining centre. We believe that as a continuation of our turning machines, Almac machines offer exactly this complementarity to our product range.

In line with our strategy, which aims to offer a diverse range of products to best meet the needs of our customers, we have grasped this opportunity especially as Almac was the perfect match for the acquisition criteria we established a few years ago.

dm: We all know stories of company buy-outs that failed because the differences were too great or the takeover led to misunderstandings. How do you intend avoiding such pitfalls?

R. Stauffer: Tornos and Almac technologies are relatively similar. Almac is a soundly managed company equipped with a great amount of expertise acquired in the watchmaking sector. The experience that Tornos brings can help the company develop in other business activities.

Tornos is organized around three product lines. We started off with 3 lines, single-spindle turning machines, multi-spindle turning machines and spare parts. With its range of machines, Almac fits into this structure perfectly.

As a general rule, we believe that a product line should generate between 50 and 100 million in turnover. Although Almac is only currently achieving 20 million, we are sure that in the long term, they will be able to reach 50 million.

The development strategy needs to be carefully managed. If Tornos is currently an ocean liner, Almac is the image of a fast and manoeuvrable yacht, but it must not be thrown off balance.

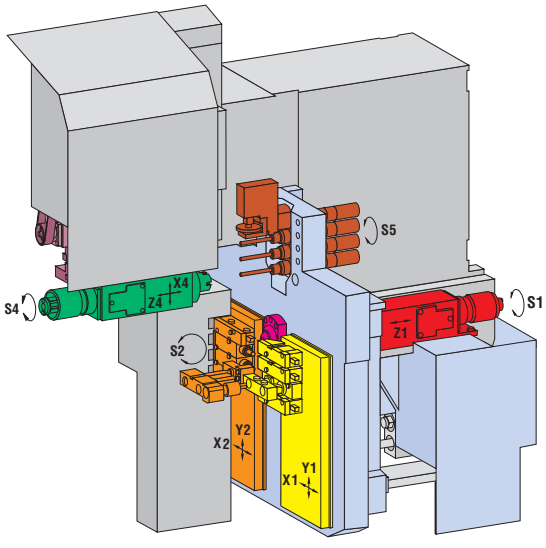
If Tornos can and must support Almac in terms of production, industrialisation and sales, we need to make sure we do not destabilize a company that works.

dm: What will the collaboration be based on?

R. Stauffer: First and foremost through dialogue, fostering team spirit. We will continue to promote a common customer focus, a results culture and innovation. As is the case at Tornos, we will draw up a plan of strategic development, build products and technology road maps help Almac to implement them, with the predominant objective being customer satisfaction.

WHY LINE «e»?

Presented as an extra for the DECO «a» and Sigma range, does this new product line have some strong sales arguments?
To find out more, decomagazine spoke to Carlos Cancer, director of the single spindle business unit at Tornos.



DECO 7/10e

decomagazine: Mr Cancer, why this new line of products?

Carlos Cancer: Our line of DECO «a» machines is well known and reputed on the market for the production of complex workpieces. Many customers wanted to benefit from the same ergonomics and kinematic base but without a tool system for manufacturing their most straightforward parts.

dm: Is it not also for that reason that the Sigma line was presented?

Carlos Cancer: Yes and no! If we are talking about parts produced, the Sigma and DECO «e» machines are fairly similar but they are very different machines that are not necessarily destined for the same customers. It's really all about expanding our product offerings and proposing an additional choice and opportunity to our customers.

dm: What are the results like with the "DECO e" range?

Carlos Cancer: In 2007 we presented DECO 10e and this machine proved a resounding success that has exceeded all our expectations. This success and the requests from our customers are the reason why we are rolling out an entire line now. We presented the DECO 13e at Simodec (in France) and Biemh (in Spain) in March and there was definite interest.

dm: I don't quite understand. If I'm not mistaken, the DECO 10a machine has always been available in a version "with fewer axes", a little bit like the DECO 10e today. So why the increase in sales now?

Carlos Cancer: Technically, it's true that a DECO 10e and a DECO 10a 7-axes of a few years ago are similar in their kinematics, but having designed a new

«e» line and taking these machines as products in their own right and not as "exceptions" means we can rationalize and pass on the cost savings to our customers with an aggressive price.

dm: What about the equipment?

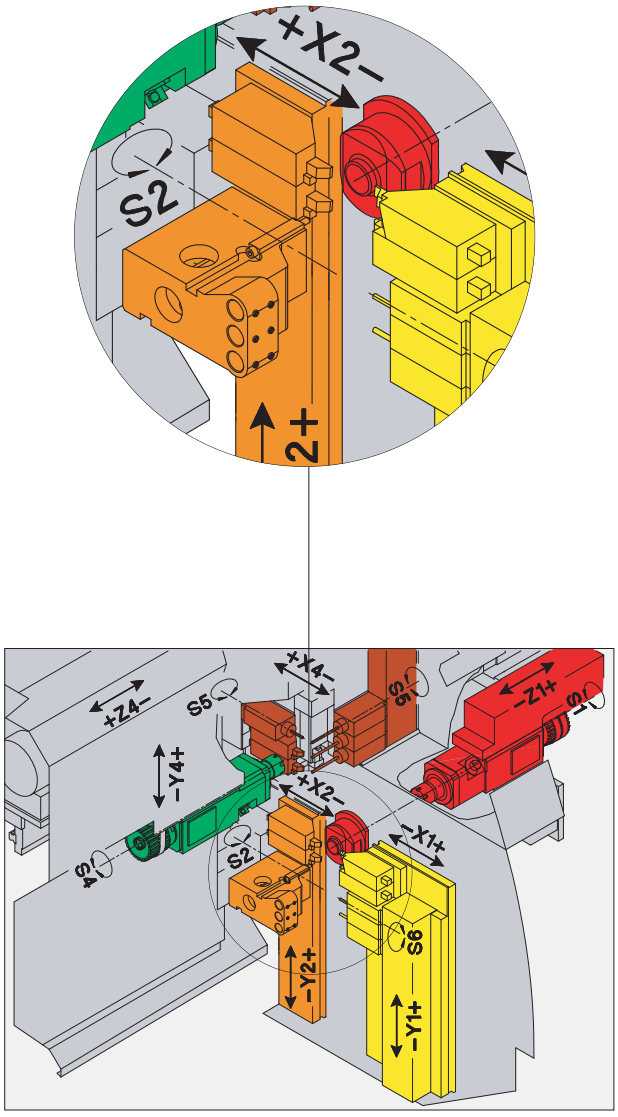
Carlos Cancer: It is another feature of rationalization, the DECO «e» is sold as a "package" featuring a standard number of options. In most cases, this equipment is perfectly suited to the manufacture of workpieces this line is designed for. If, however a customer does require other operations, other options can be added.

dm: Why wasn't this family presented sooner?

Carlos Cancer: We have developed many products over the years and if these ones are presented now, it's mainly because the market has changed and is demanding more solutions. Our customers are still interested in our DECO «a» for manufacturing ever more complex parts, but at the same time they are looking to rationalize production of more straightforward parts. This is a reason why we will be proposing the DECO e, Sigma and even Delta[1] very soon.

dm: Is it not a little complicated for customers to know what kind of machine they require?

Carlos Cancer: Customers know what they need in terms of machining or parts to produce, it is then up to us to suggest the most appropriate product. We have a wide range of products on offer and our sales



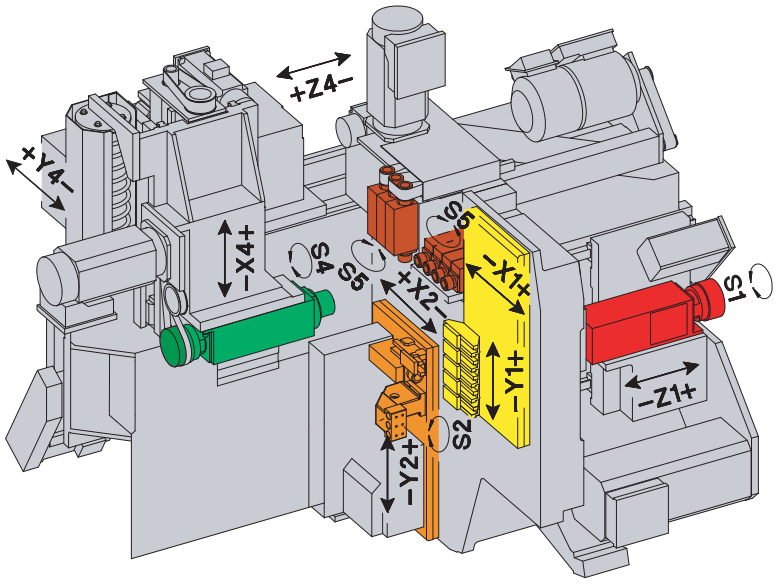
DECO 13e

[1] See interview with Mr Alain Augsburger on page 62.

network is able to meet a requirement and propose the best solution, whether in terms of machining, programming (ISO or TB-DECO) or kinematics.

dm: To sum up, who is this range designed for?

Carlos Cancer: DECO «e» machines are designed for customers who recognize the benefits of the DECO kinematics and programming system. They will be able to fix «a» fittings to «e» machines and vice versa. For the others, the Sigma range provides the perfect solution. From the first ten machines sold, we were also surprised and pleased to discover that this line is a gateway to the "world of DECO".



DECO 20/26e

QUICK GLANCE ON THE CHARACTERISTICS OF SINGLE SPINDLE TORNOS PRODUCTS

	Micro 7	Micro 8	DECO 10e	DECO 10a	Delta 12/3	Delta 12/4	Delta 12/5
Max. bar capacity	7 (9) mm	8 (10) mm	10 mm	10 mm	12 mm	12 mm	12 mm
Max. length of part single clamping	60 mm	17,5 mm	60 (90) mm	60 (90) mm	210 mm	210 mm	210 mm
Spindle rotational speed	100-20'000 rpm	100-15'000 rpm	100-16'000 rpm	100-16'000 rpm	200-12'000 rpm	200-12'000 rpm	200-12'000 rpm
Max. spindle power	2,2 (3,7) kW	2,2 (3,7) kW	1,1 (3,7) kW	1,1 (3,7) kW	1,5 (2,2) kW	1,5 (2,2) kW	1,5 (2,2) kW
Counter spindle rotational speed	100-20'000 rpm	100-15'000 rpm	100-12'000 rpm	100-12'000 rpm	–	200-12'000 rpm	200-12'000 rpm
Number of axes (simultaneous)	5 (7/axes C)	5 (7/axes C)	7 (9/axes C)	9 (11/axes C)	3 (12/3 I & II)	4 (12/4 I & II)	5

	DECO 13e	DECO 13a	DECO 20e	DECO 20a	Sigma 20	Delta 20/3	Delta 20/4	Delta 20/5
Max. bar capacity	13 (16) mm	13 (16) mm	20 (25,4) mm	20 (25,4) mm	20 (25,4) mm	20 mm	20 mm	20 mm
Max. length of part single clamping	180 mm	180 mm	200 mm	200 mm	200 mm	210 mm	210 mm	210 mm
Spindle rotational speed	100-10'000 rpm	100-10'000 rpm	100-10'000 rpm	100-10'000 rpm	200-10'000 rpm	200-12'000 rpm	200-12'000 rpm	200-12'000 rpm
Max. spindle power	2,2 (3,7) kW	2,2 (3,7) kW	3,7 (5,5) kW	3,7 (5,5) kW	2,2 (3,7) kW	1,5 (3,7) kW	1,5 (3,7) kW	1,5 (3,7) kW
Counter spindle rotational speed	100-10'000 rpm	100-10'000 rpm	100-8'000 rpm	100-8'000 rpm	200-10'000 rpm	–	200-12'000 rpm	200-12'000 rpm
Number of axes (simultaneous)	8 (10/axes C)	10 (12/axes C)	8 (10/axes C)	10 (12/axes C)	6 (8/axes C)	3 (20/3 I & II)	4	5

	DECO 26e	DECO 26a	Sigma 32
Max. bar capacity	26 (32) mm	26 (32) mm	32 mm
Max. length of part single clamping	240 mm	240 mm	200 mm
Spindle rotational speed	100-8'000 rpm	100-8'000 rpm	200-8'000 rpm
Max. spindle power	5,5 (7,5) kW	5,5 (7,5) kW	3,7 (5,5) kW
Counter spindle rotational speed	100-6'000 rpm	100-6'000 rpm	200-8'000 rpm
Number of axes (simultaneous)	8 (10/axes C)	10 (12/axes C)	6 (8/axes C)

NINE PRODUCTS FROM NEW RANGE LAUNCHED SIMULTANEOUSLY!

All from the Tornos Delta range.

The Tornos range has now been rounded off with 9 new models! A great choice of targeted products now available to our customers.

The main European and American trade fairs are approaching this summer and Tornos is taking this opportunity to unveil its new Delta range. This series of machines was born of the agreement reached with Tsugami, comprising nine models from 12 to 20 mm in 3, 4 and 5 axes[1] with the Swiss manufacturer now delivering an altogether simpler range of machining solutions.

decomagazine met up with Alain Augsburger, the man in charge of the Delta line at Tornos to talk about this radical new development.

decomagazine: Mr. Augsburger, why did you create this Delta range - does it not represent a departure from what I might call the historical market for Tornos?

Alain Augsburger: In actual fact, this new range is perfect in keeping with our development strategy, and we wish to offer machining solutions for all types of needs relating to automatic turning machines. With Delta, we will be offering entry-level products. Our customers need different machines depending on the workpieces they have to produce. We are being asked to provide simple machines that enable these customers to create relatively straightforward workpieces in a cost-effective manner.

dm: Could you tell us more about this agreement with Tsugami? Are these Delta machines true Tornos machines, or are they Tsugami products?

AA: There is no doubt about this matter: these are true Tornos machines, which happen to be manufactured by Tsugami. Essentially, we are working with Tsugami as a manufacturing partner, producing Tornos machines on our behalf. The assembly lines in these factories will include beige machines as well as machines made to the new design and sporting the colors of Tornos.

[1] We will see this in more detail further in this article.

dm: What prompted you to work with Tsugami, are they not one of your competitors?

AA: True enough, we are sometimes in competition with one another, but only on rare occasions. You see, Tsugami products complement rather than compete with Tornos products. This is true in terms of their differences on the market in terms of level and presence.

Our agreement is founded on several points, one enabling us to produce Delta machines at Tsugami, a company with a good production capacity. Both parties stand to gain from this arrangement. Secondly, Tsugami is going to help us promote our multi-spindle turning machines in Asia.

dm: What underlines this partnership decision? Would it not have been simpler to develop the Delta range yourselves?

AA: The partnership enables us to benefit rapidly from expertise in the production of simple machines. If we had launched ourselves into the industrialisation of this type of product from a standing start or virtually from zero, we would have needed much more time.

dm: This Delta line is intended for the production of simple workpieces and is distributed by the Tornos network. What is the intended target market?

AA: Our Delta 12 and Delta 20 machines are aimed at all companies involved in the bar-turning business and who manufacture simple workpieces requiring 3, 4 or 5 axes machining. It's certainly true that we will be offering new means of production to our existing customers, providing a wider range of choice as well as offering the same to all the other companies out there who are not yet customers of Tornos.

dm: It is well known that the more complex the parts being manufactured, the more scope is needed to adapt the machine. Sometimes, this type of product is also sold with a turnkey setup, i.e. ready for immediate operation. What will the Delta machines have to offer in this regard?

AA: Our machines are sold fully equipped whilst it is still possible to add a few options; we are talking of simple machines. These are not the DECO units on which virtually any device or fixture can be fitted. Here, we are looking at quite a different scenario. With regard to turnkey setups, I would say that the door is not closed, but this approach is not common with this type of product.

dm: What training provision is available for buyers?

AA: We will deliver this service. Given that this is a range of simple machines featuring standard programming, Delta only requires a small amount of training provision.

First image of the team around a Delta unit during assembly work in Japan. From left to right: MM. Yuno (Tsugami), Wyss (Tornos), Shirai (Tsugami), Shirakura (Tsugami), Paccaud (Tornos), Watabe (Tsugami), Rieder (Tornos), Terai (Tsugami) et Zannato (Tornos).

Tornos design and colour scheme: these Delta machines blend seamlessly in any predominantly Tornos workshop environment (Micro, DECO, Sigma or multispindle). Their low-key appearance and sought-after ergonomics will be appreciated by every practitioner in this sector.

dm: You do not program this family of machines with TB-DECO, do you?

AA: No. The performance of the TB-DECO increases as the number of axes rises. The simpler the machine, the less this system benefits can offer. Since Delta machines are very simple, we opted in favor of standard programming.

dm: Could you tell us about the machines being offered?

AA: We are bringing nine machines to the market in the first instance: a 12 mm unit with 3 axes, one with 4 axes and a 12 mm unit with 5 axes. The 12 mm 3 and 4-axis machines are being offered with rotating tools. Then we are fielding three 20 mm machines, with 3, 4 and 5 axes respectively (refer to the summary table page 61).

dm: What is the difference between these units and other products on the market?

AA: We have placed great emphasis on the ergonomics of these machines. It is obvious that, for very simple machines, the basic functions required of them are very simple to deliver, so emotional considerations perhaps weigh more heavily in the balance.

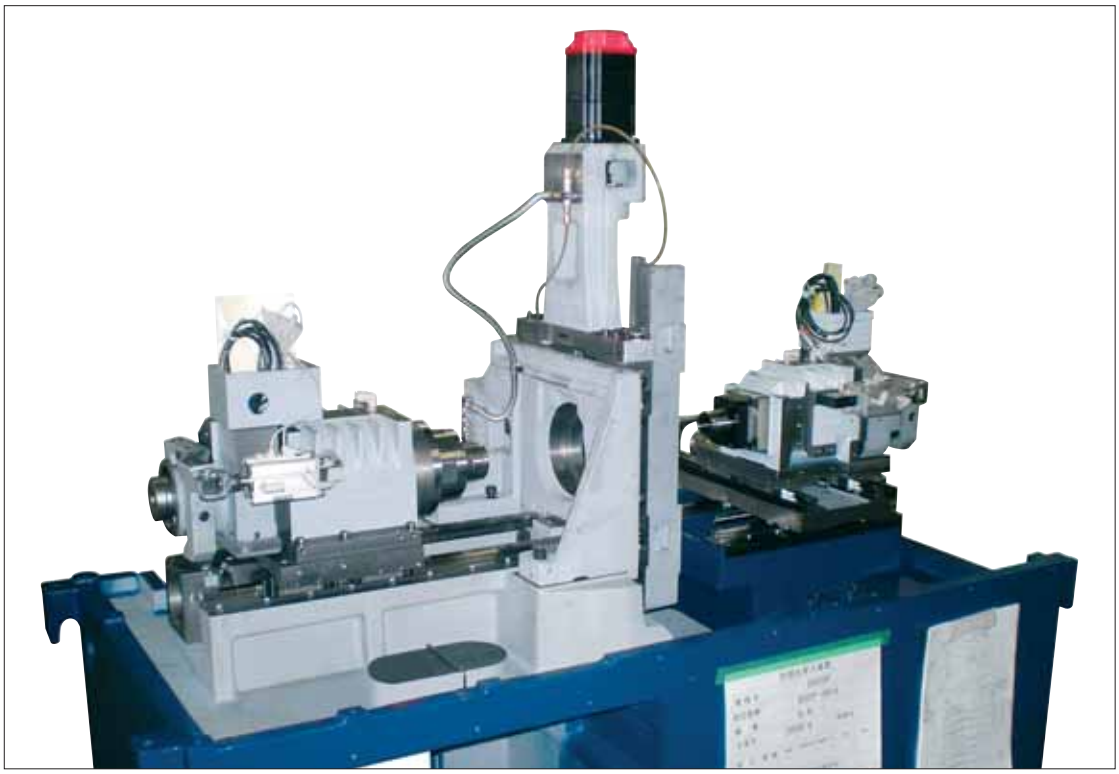
We will be providing a true Tornos machine that operators will find very agreeable to work on. The simplicity of access, good visibility, ease of tool changing are all features that make the Delta range a competitive and highly effective alternative to other products on the market. One important element is our ability to offer a complete range. If it arises that one particular Delta machine is not perfectly adapted to customers needs, we can offer them a Sigma or a DECO e, or even perhaps a DECO a[2].

dm: What can you tell us about the bar feeder and its options?

AA: We are going to be selling a choice of machines with or without a bar feeder. Obviously, the bar feeder we provide is one adapted to suit the price of the machine. With regard to the options, as mentioned above there really are very few to choose from.

dm: You are banking on offering machining solutions at a carefully considered price to enable customers to manufacture simple work-

[2] Refer to the comparison table in the interview with Carlos Cancer on page 61.



Mounted on a solid cast-iron base, the generously proportioned structural features and tool systems guarantee precision and quality.

With 3, 4 or 5 axes, with or without a rotating tool, the Delta range offers an interesting alternative to products already on the market.

pieces. Traditionally, this market has called for a great deal of responsiveness. What will be your delivery lead times?

Alain Augsburger

The first machines will be available towards September/October 2008 and thereafter we will be planning on the basis of delivery lead times of 2 to 4 weeks.

dm: Many thanks Mr. Augsburger; we have a firm date in our next edition to talk to you in more detail about the characteristics of these machines, with a view to presenting the entire Delta range to our readers.

For all questions relating to the Delta range, please feel free to contact Alain Augsburger at all times augsburger.a@tornos.com

LAST MINUTE

Delta 20/5 II (20 mm 5 axes equipped with rotary tools) was exhibited at Siams in Moutier (Switzerland) from 20 to 24 May 2008.