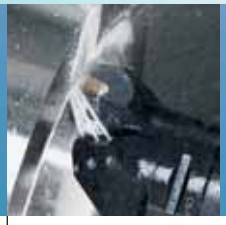
decomagazine

THINK PARTS **THINK TORNOS** 64 01/13 ENGLISH

WATCH ME!

Swiss Watchmaking and Tornos: An Enduring Love Story



Machining Medical Parts – New Developments that lift Performance

Subcontractor buys Hi-Spec Tornos based on YouTube Footage

As clean as they come

UTILIS

multidec®

swiss type tools

PRECISION TOOLS FOR THE MICROMECHANICAL AND THE MEDICAL INDUSTRY

UTILIS®

Tooling for High Technology

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

11 17 33 38

A Tablet at the Service of Bar Turning

Giving Swiss Watchmakers a Competitive Edge

A Million Times, precisely: Easydec Timepiece Components

CTM V6 – Optimal Process Monitoring linked to the Machine

IMPRESSUM

Circulation: 16'000 copies

Available in: Chinese/English/French/German/Italian/Portuguese for Brazil/Spanish/Swedish

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

Editing Manager:
Brice Renggli
renggli.b@tornos.com

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

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

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

Contact:
aeschbacher.j@tornos.com
www.decomag.ch

SUMMARY

Our Customers are amazing!	5
The Watchmaking Machine of the Future	7
A Tablet at the Service of Bar Turning	11
Swiss Watchmaking and Tornos: An Enduring Love Story	14
Giving Swiss Watchmakers a Competitive Edge	17
A place to meet: Trade Shows	22
Machining Medical Parts – New Developments that lift Performance	29
A Million Times, precisely: Easydec Timepiece Components	33
CTM V6 – Optimal Process Monitoring linked to the Machine	38
Subcontractor buys Hi-Spec Tornos based on YouTube Footage	43
As clean as they come	47

GWS TOOLING SYSTEM FOR TORNOS MULTISWISS 6X14

UNIQUE!

TAKE PART AND WIN!

Learn more about our GWS tooling system and, with a little luck, win a new iPad 3.

For the competition go to

www.goeltenbodt.com/tornos-multiswiss

The new GWS tooling system for TORNOS MultiSwiss 6x14 is unique in its design. Profit from the highest cost effectiveness, precision, flexibility and efficiency with GWS.

- Positioning – Variable or 0-point
- Highest repeatability
- Maximum flexibility
- Standard GWS tool holder for use on a variety of machines
- Variable coolant management for choosing high or low coolant pressure

More detailed information can be obtained from Göltenbodt and TORNOS.

GWS for TORNOS MultiSwiss:
Technological competence comes from Göltenbodt!

Göltenbodt®
Innovation and Precision.

Göltenbodt technology GmbH ■ D-71229 Leonberg ■ Tel: +49 (0) 7152. 92 818 - 0 ■ info@goeltenbodt.de ■ www.goeltenbodt.com

OUR CUSTOMERS ARE AMAZING !

The magazine you're currently reading was launched in 1996. Over time it has carved a niche for itself in the world of technical literature relating to bar turning and precision manufacturing. Today the magazine has a worldwide circulation of 16,000 and is available in 8 languages: This makes it a unique promotional tool. We have always sought to retain a certain neutrality in this publication; our main aim is to present innovative technical solutions to our customers to enable them to engage with new markets or simply to resolve existing machining problems.

decomagazine also enables our customers to report on their success. These presentations have allowed numerous companies to increase their profile and share their success stories with the world. Over the years, the Tornos range has developed, incorporating a more extensive product line to continue building on our success. We have also developed or acquired brand new technologies for our group, including milling and, more recently, the creation of the Cyklos company, which operates in the field of autonomous surface treatment equipment. We are committed to constantly improving our equipment as well as our products and services offering.

At Tornos, we measure our success by the success of our customers. With so many success stories, from customers both large and small - it goes without saying that we're proud to have played our part in them all. You can count on us to do all we can to maintain this success - your success.

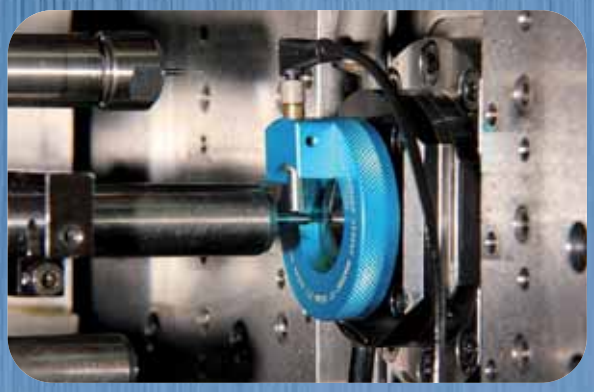
Brice Renggli
Marketing Manager

SWISS LINE

New spindle centering system
Makes your life easier !

HIGH PRECISION – FAST – SMART

Video >>> www.wibemo-mowidec.ch



WIBEMO SA
WILLY BENDIT
OUTILLAGE DE PRÉCISION

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

THE WATCHMAKING MACHINE OF THE FUTURE

Tornos has a well established reputation in the field of bar turning for watchmaking, but never before the launch of SwissNano had a manufacturer gone so far ahead in design, ergonomics and integration research into a human-machine interface with a radical focus on efficiency and simplicity.

For more than 100 years, Tornos has been manufacturing machines aimed at watchmaking, and for around twenty years the company has been providing NC solutions to meet highly specific watchmaking requirements (Deco 7 & 10, Micro 7/8, Delta 12 and EvoDeco 10, to mention only a few). Therefore the company knows the market and has had its engineers pull out all the stops to develop a machine whose design stands out resolutely against other products in the market. The aim: to create a new category.

Combining all aspects of design

It is well known that design must bring together two aspects: aesthetics, which plays on emotional effect, and the practical aspects that work on both a rational and emotional level. Mr. Renggli, the Tornos Marketing Manager, told us: *"We wanted to create a modern automatic turning machine with a 4mm capacity, occupying minimum floor space and with complete 180° access; hence this frontal design, and the integration of a tablet in addition to the conventional control."*

Frontal access: complete freedom of action

Given the space constraints in watchmaking workshops, the machine was developed so as not to require any rear access. If necessary, it can even be placed against a wall. The machining area is protected by a 'bubble' and is accessible from all sides. Mr. Renggli, reports: *"The setup is user-friendly, not only is everything easily visible, but it also gives us ideal accessibility. We had a very positive experience."*

Producing 2/3 of movement parts

The SwissNano was intended to be a resolutely, uncompromising watchmaking machine and its kinematics enable it to produce 2/3 of watch movement parts, from simple to complex parts, including for instance gear hobbing. Regarding the precision and quality, Mr. Renggli tells us: *"The test customers have produced many types of part and the machine runs 'like clockwork', behaving to their complete satisfaction."*

Designed for stability

The kinematic structure was designed for exemplary balance and thermal management. The axes and cast iron members are aligned symmetrically to the guide bush, and the thermal aspects are managed by

'mini-loops' that prevent heat propagation. The structure is anchored on three damped points. What about the results? Rigidity and vibration stability reach new peaks. Consequently, machining precision and quality are everything that they should be. Mr. Renggli specifies: *"Results of the tests were never able to fault the machine, either with respect to the high precision required in watchmaking or in terms of quality of finish."*

Setting, monitoring and interaction

The SwissNano includes a precision tool setting system using a sensor and feeler probe. The aim? To provide a user-friendly system able to position the tools to within 3 to 8µ, according to the bar diameter. The greatest advance may be in terms of communication. SwissNano has a graphic tablet on top. All the basic production data (workpieces, products, machine, bar changeover, fleet monitoring, etc.) are reported on this interface. At a glance, the operator can access all the data for a specific machine or for the whole fleet (access management is of course secure, and only authorised persons can access predefined information levels). Tablet connectivity provides a number of other services. For more on this subject, see the article 'A tablet at the service of bar turning' on page 11.

Coming soon

SwissNano will be presented from 5 to 8 March on the manufacturer's premises in Moutier, as part of its now traditional week of watchmaking open days. This will be followed by presentations at EPHJ/EPMT.

TORNOS

Tornos SA
Industrielle 111
2740 Moutier
Tel. +41 32 494 44 44
Fax +41 32 494 49 07
contact@tornos.com
www.tornos.com

SWISSNANO – MAIN CHARACTERISTICS

Max. workpiece diameter:	4 mm
Dimensions (L x w x h):	1.8 m x 0.65 m x 1.6 m
ARCHITECTURE	
Operations	
– X1/Y1 platten:	7 turning tools (8 x 8 mm)
– X2/Y2/Z2 end-mounted tools:	3 (Ø 16 mm)
– Gear hobbing device:	yes (option)
– Transverse drills:	2 (option)
Counter-operations:	2 end-mounted tools (Ø 16 mm)
Op./counter-op. power:	1 kW
Op./counter-op. max. speed:	16,000 rpm
Spindle/counter spindle:	induction motor
Guide bushes:	fixed, rotating and working without guide bush
Options available:	HF spindles, polygon tool
Peripherals:	Carousel collection system, vacuum, oil mist collector, fire prevention system

A TABLET AT THE SERVICE OF BAR TURNING

The SwissNano marks a break from the rest of Tornos' range in terms of the design and concept of the machine; its aim is an ambitious one. Fully manufactured in Switzerland, it must meet very stringent cost requirements, so as to be able to counter Japanese and Korean competition, often manufactured in low-cost economies. The SwissNano is a demonstration of the performance that the Swiss industry can offer. Furthermore, it must stand as a potential replacement for the legendary M7 and MS7 that remain the benchmarks for a good number of workpieces, both in terms of precision and productivity. Therefore, the SwissNano will have to be equipped with the very latest technologies to be a success, but we were astounded to discover that an as yet untapped technology has made its appearance on the SwissNano. It incorporates an application that allows machine production to be remotely monitored. Decomag met with Olivier Marchand, Chief Technology Officer at Tornos, to find out more.

decomagazine: Mr. Marchand, we were delighted to be able to discover the SwissNano, and we were very surprised to see a tablet on the machine. Can you tell us more?

Olivier Marchand: In what I think is actually a first for the industry, the SwissNano can communicate with an Android® tablet via a standalone Wi-Fi network which is created between the machine and the tablet. This application allows information on the machine state, the production status and the plan for the workpiece currently being created on the machine to be brought up and displayed, along with the service and maintenance instructions, alarms and their troubleshooting methods. All of this is available in a modern, practical interface.

What is more, the application is not limited to one machine; it allows an entire workshop or a bank of particular machines to be monitored!

dm: Can the machine be controlled via the tablet?

OM: No, the tablet only allows information to be brought up from the numerical control and displayed. Management of machining and the workpiece programs remains the preserve of the numerical control, with the latter staying completely independent. The tablet is not able to influence the activities of the numerical control in any way.

dm: Is it a kind of improved OEE interface?

OM: OEE interfaces allow several makes of machine and numerical control to interface. These are complex and relatively expensive systems that allow our customers to monitor their entire workshop. These modules are able to provide reports, whereas our application currently only covers the SwissNano. Depending on its success, we will extend it other Tornos machines. The functions of the application are already very complete and cover most requirements. Again, if successful, we will no doubt expand the options available to the user.

dm: So is it a gadget?

OM: No, not at all! Imagine that an alarm occurs; the application does not simply give you a remote warning that production on your machine has stopped, it searches the service instructions for possible solutions to this alarm, saving you precious time. The machine will be equipped with a USB port allowing the tablet to be recharged directly on the machine. It will also be possible to display the machining information on the tablet in slideshow mode, and to use the tablet as the machine's instrument panel.

dm: So, it is a tool to increase the customer's productivity.

OM: Yes, absolutely. Just think, you can monitor your entire bank of machines on your tablet and check the status of each machine, without having to move. This will obviously save you time, as if there is an alarm on a machine you know immediately what is wrong and how to resolve it. The service and maintenance instructions are integrated, so operators can consult them and find content within them ergonomically.

There is no doubt this application helps speed things up and improves efficiency. Furthermore, it is possible to log in to the SwissNano forum to put questions to our team software hotline and to consult the tricks and tips which are posted by our team.

dm: What about security and confidentiality?

OM: This is not a problem. In the standard scenario, the machines and the application are not connected to the Internet or to any network. The machine and the tablet create their own networks automatically. The application recognises the machines in the workshop and communicates with them via their own network. With concerns over confidentiality, no information is fed back, either to Tornos or to any server. Some customers who have a workshop network can take advantage of this network when using the application to go beyond the physical limits of the tablet's Wi-Fi, so they can monitor their machine inventory via the network. The application can then use either its own network or the network already in place.

dm: What does the customer need to make use of this application?

OM: An Android® 4.0 tablet with a 10" screen, for easy reading. A range of manufacturers make tablets with this operating system, which is why we chose Android®, to give customers a choice; furthermore, there are IP67 or IP68 certified tablets that can be used in corrosive environments.

dm: Is an extension to other platforms planned?

OM: At the risk of repeating myself, this will depend on the success of this application, but we could expect to see an iPad or Windows version of this application.

dm: Will each SwissNano be supplied with a tablet then?

OM: It is the customer's responsibility to get hold of an Android® tablet, if they wish to use this functionality. They can then choose the tablet that best meets their requirements.

SWISS WATCHMAKING AND TORNOS: AN ENDURING LOVE STORY

Watchmaking is a part of Switzerland's heritage; likewise, Tornos is part of the watchmaking heritage. The very history of Tornos is entwined in the history of watchmaking. The company was founded just as the first watch parts, such as movement screws, were being industrialised in the 19th century. Here we interview Carlos Almeida, head of the Swiss market and the watchmaking and micro-technology market segment.

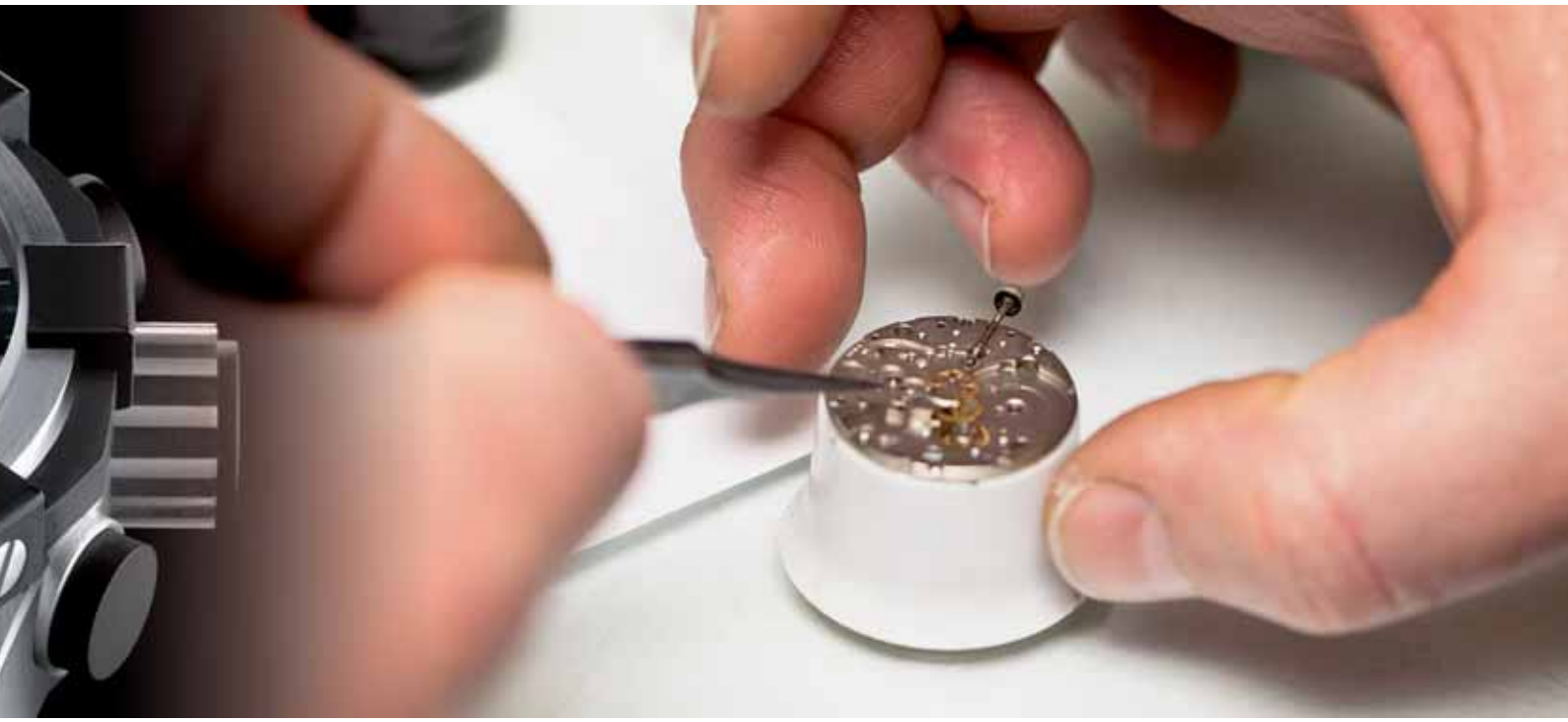
As a result, Tornos still uses certain machining methods that has seen traditional craftsmanship turn to modern industrial processes. Just like Swiss-Made watches, the global bar turning sector recognises Swiss quality and expertise, with machines in the industry referred to as "SwissType" (bar turning machines in English). This demonstrates that authentic Swiss bar turning is an expertise particular to our local industry, which comprises a network of tool makers, machine manufacturers, subcontractors, manufactures and watchmaking groups.

Constantly adapting…

Mr. Almeida explains: *"The extremely small and highly precise, is part of our day-to-day work, and that's why our network is unrivalled in a highly competitive industry".* Tornos has spent many years adapting to meet the changing needs of the modern watchmaking sector. The design, materials, processes, quality and part checks have evolved, and are now used like industry standards. This qualitative approach enables watch manufacturers to distinguish their brands from competitors and promote their SwissMade image.

… to changing needs

In recent years, additional criteria concerning production tools have been added to the general requirements of Swiss watchmakers. The production tool must have the smallest possible footprint, be easy to use and enable 24-hour operation while keeping investment costs to an absolute minimum. *"These challenges were a motivating factor in our developments for the watchmaking sector, which accounts for around 20% of sales for the Tornos group.*



Following on from the Deco, Micro and EvoDeco ranges, we are looking forward to the world première of our SwissNano bar turning machine at the 5th "Journées Horlogères Tornos" (Tornos watchmaking exhibition). This machine includes all of the features requested by Swiss watchmakers", explains Mr. Almeida.

The perfect new compromise

The innovative design of this machine offers unrivalled accessibility and superb performance while guaranteeing exceptional ease of use. Mr. Almeida concludes: *"A big current, and future challenge for the watchmaking industry is keeping and expanding our qualified workforce. Tornos plays an active role in professional training, working with 7 centres throughout Switzerland offering training to both adults and youngsters. We can only develop innovative solutions in a field like bar turning by imagining the next generation of bar turners. One of our mantras was: "Let's make this a young person's machine". The tablet interface, dynamic appearance and easy settings will attract young talent to the wonderful field of bar turning, and this will enable us to expand Swiss watchmaking by sustaining the strategic occupations necessary for the production of parts used to build watches - the archetypal Swiss product".*

HAROLD HABEGGER

Canons de guidage
Führungsbüchsen
Guide bushes

Type / Typ CNC

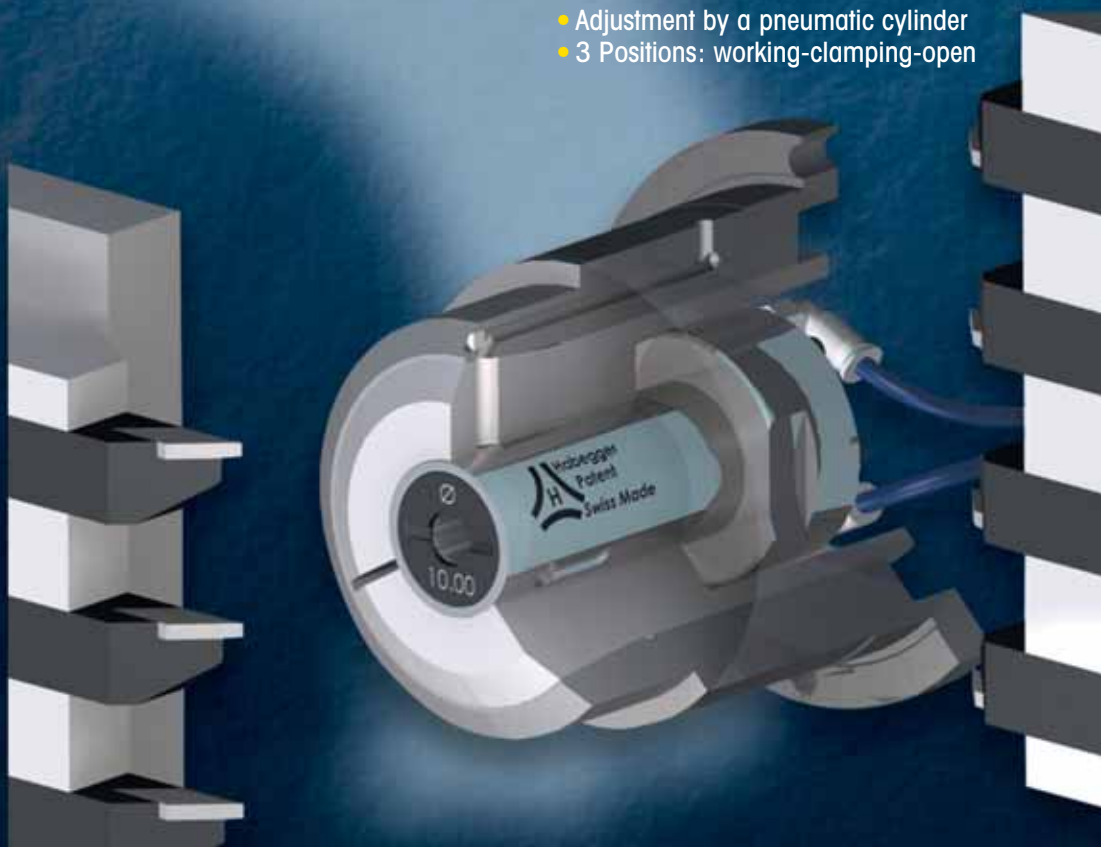
- Canon non tournant, à galets en métal dur
- Evite le grippage axial
- *Nicht drehende Führungsbüchse, mit Hartmetallrollen*
- *Vermeidet das axiale Festsitzen*
- Non revolving bush, with carbide rollers
- Avoids any axial seizing-up

Type / Typ C

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

Type / Typ TP

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



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

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

GIVING SWISS WATCHMAKERS A COMPETITIVE EDGE

Linear guide rails developed by CNC machine-tool manufacturer Almac, ensure that Swiss watchmakers that use their ultra precise 3 to 5-axis machining centres produce better quality components.

Couple that to their long-standing use of Alphacam, one of the most popular CAM systems in Switzerland's watch industry, and it's easy to see why Almac are a leading supplier of high precision machines for all aspects of Swiss watch production.

Unique design

Almac Director Philippe Devanthéry says they are the only machine manufacturer using the technology of four linear guide rails fixed on a prism. *"This enables us to give a high warranty of movement in*

the Z-axis. The four guide rails hold the spindle in perfect linear position, so there's absolutely no tilting of the spindle. And there's no thermal displacement of the spindle, as the heat goes into the centre of the prism."

He says the machines guarantee very high stability and accuracy and this gives top machining quality. *"The watchmakers who use Almac CU 1007 machining centres produce better quality components than their competitors that don't have them."* It has X and Y slides on pre-stressed rails and a ball screw. The vertical axis is formed by the solid cast iron prism, which a rectangular sleeve moves on. This is guided by the linear rails and moved by a ball screw. As well as the watch industry, Almac machines are used for other micro-machining applications such as medical equipment, aeronautics, jewellery and electronic component connectors.

A few microns

"Many of our customers, particularly leading names in the watch industry work to extremely accurate detail, often as tight as five microns. They need their machines to be in almost constant production day and night, so we supply the full package, including robots, loading and unloading stations and peripheral equipment for cleaning and deburring, all finely tuned to our customers' needs" says the director. The company is located in La Chaux-de-Fonds at the heart of the watch industry and its employees know that their precision and orientation to quality, help Swiss watchmakers shine worldwide.

Tailored solutions, both hardware…

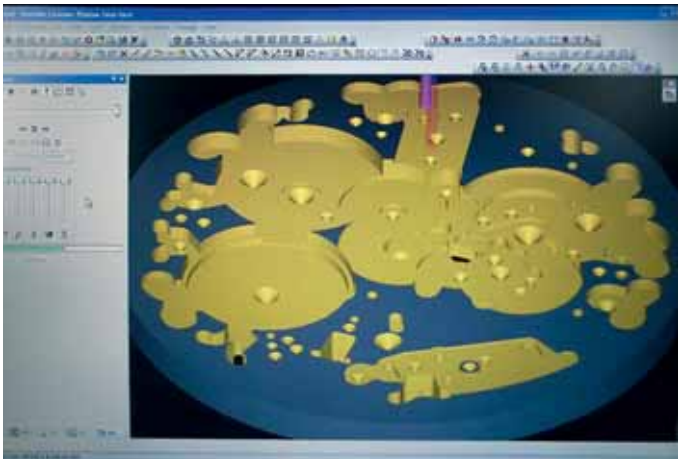
In all cases where Almac produce components as part of the machine acceptance process, they use Alphacam to generate the NC codes. When handling new enquiries, it will receive details of a part for the manufacturing trials in a .step, .iges or .dxf file and create programs for the demonstration in Alphacam every time.

Almac also supply customers with special modules of Alphacam developed by the software's Swiss reseller, MW Programmation, for a number of specialist functions. For instance, watch decorations were done by

CLOSE TO CUSTOMERS

Almac is part of the Tornos Group, and has undergone restructuring in the past year. We asked Mr. Devanthéry to clarify Almac's situation: *"There are now 22 of us at the La Chaux-de-Fonds site, and we have retained all of our expertise and activity in La Chaux-de-Fonds, for example marketing, sales, assembly, setup and fine tuning to meet customers' needs and services, to remain as close as possible to our customers"*. He added: *"Being part of a group is an advantage; for example, we can access resources that we may be lacking from time to time (particularly for assembly)"*. The new director, appointed in November 2012, has visited numerous customers and, as he explains, understands their needs: *"What's important for our customers is that Almac can offer long-term expertise and that they can always count on us, and that's exactly what we're aiming for."* With more than 1,000 machines sold (80% custom-built) mainly to the watchmaking sector, the manufacturer knows the constraints of the sector only too well and has the means to address them (see box: "A rationalised product range").

hand before Almac designed CNC machine tools to implement exclusive pioneering solutions for machining and decorating components that make up watch movements. These machines are programmed by Alphacam. Almac also produce a range of specialist machines for manufacturing dials, cases, case attachments and links.



… and software

The macros for several of the special functions were originally created by MW Programmation at Almac's instigation, and now form part of MW's industry-wide service across Switzerland. They include machining perlage (aspects of decoration such as circles, spirals and linear patterns); sequential numbering to automatically generate serial numbers of pieces without needing to change the NC program manually; palpage, which defines exact placement of the piece before machining; and diamond settings, allowing parameters of the amount, size, and space between stones to be input.

Cloudlike decoration included

Philippe Devanthéry says perlage is a particularly important aspect – often applied to the inside surfaces of plates and bridges as well as on the dial side of the main plate. The cloudlike decoration is generated by the tool only briefly stippling the metal. In addition to producing all their NC codes with Alphacam for machine acceptance tests, Almac recommend the software as part of their package to start-up companies buying CU 1007 machining centres.

A complete solution

MW Programmation work closely with Almac on every aspect of their customers' Alphacam needs, including the macros, post processors, training and technical support. MW have two training rooms at their headquarters in Malleray in northern Switzerland, where they can tailor both basic and advanced courses to individual customers' requirements.

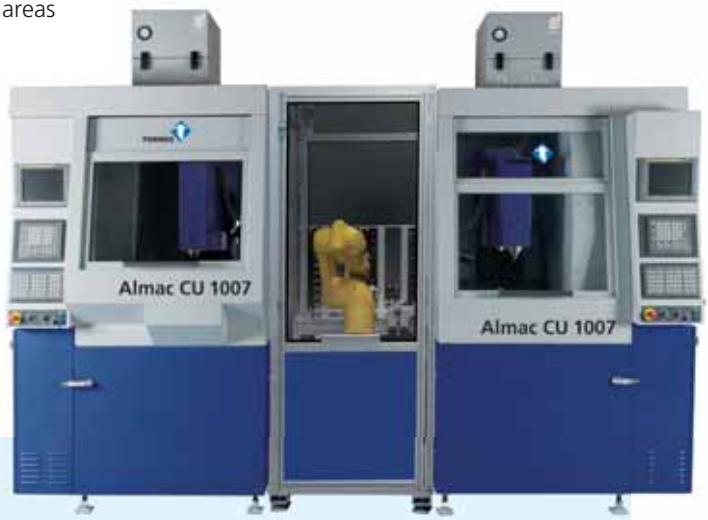
Alphacam is part of the Vero Software stable, and MW Programmation won the Alphacam Outstanding Achievement Award at Vero's 2012 Global Resellers Conference for their specialist vertical market dominance. This includes 350 supported customers that is consistently gaining the highest revenue in the reseller channel.

A recent addition to Alphacam's functionality is a new Waveform 3D Roughing Strategy, which MW Programmation Director Marcel Weber says will be of particular benefit to the watch industry. *"The new high speed machining technique maintains a constant tool cutting load by ensuring consistent tool engagement in the material. The tool moves in a smooth path to avoid sharp changes in direction, maintaining its velocity. This dramatically decreases the machining cycle time."*

This strategy, which is already proving popular with a number of MW's 1,000 clients across Switzerland, is superior to the traditional Roughing cycle where machined geometry features are offset – inward or outward – by a step over. Traditional tool paths have to run slower feeds and speeds because of the variable width-of-cut conditions encountered in corners. Tool load spikes as chip thickness increases in areas where the tool finds more material than it did while cutting in a straight line.

Almac for today and tomorrow…

In order to ensure they remain a key machine supplier to the top end of the Swiss watch market, Almac are developing the skills of a number of apprentices, to enable them to set the linear guide rails, which Philippe Devanthéry says is a specialised task. *"It takes a high degree of expertise to manufacture our CNC machines, and an even higher degree of expertise to adjust the guide rails to the absolute level of precision required to ensure it is absolutely impossible to tilt the spindle."*



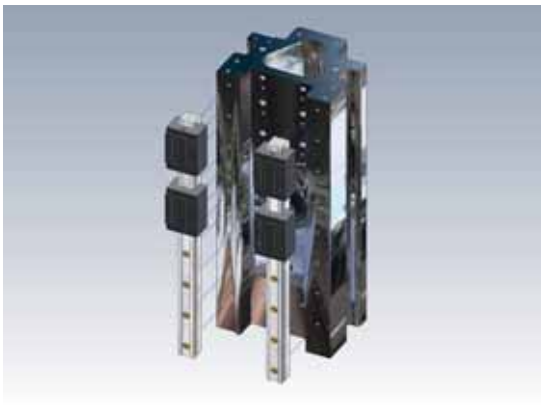
A RATIONALISED PRODUCT RANGE

One of Almac's strengths is its highly flexible product design, which uses modular bases. However, over the years many versions have been produced and this has sometimes led to a lack of clarity. The company has reworked its product ranges and now offers four main product families:

- CU 1007, CU 1007 Perlage and CU 1007 Dials – High-precision micro-machining centres
- FB 1005 – Bar milling machine for very high production rates
- GR600 Twinn – Decoration, diamond dressing and engraving machine
- CU 2007 and 3007 – Vertical machining centres

Mr. Devanthéry explained: *"We have a presence of over 80% in the watchmaking sector, and we really want to diversify - that's one of the main reasons why we launched the CU 2007 and 3007 machining centres at the end of last year".*

The company's dynamism continues, with several new versions of highly specialised machines for applications due to be unveiled at major trade shows in 2013.



In conclusion, the director explained: *"Almac is entering a new period of development; we have a sound knowledge of our customers' business and our whole team is motivated to succeed. In addition, we can offer new solutions to complement our offering and meet a full range of needs. Don't hesitate to put your trust in an Almac solution; you won't be disappointed."*

TORNOS Almac

ALMAC SA
39, Bd des Eplatures
CH-2300 La Chaux-de-Fonds
Tel. +41 (0)32 925 35 50
Fax +41 (0)32 925 35 60
info@almac.ch
www.almac.ch

A PLACE TO MEET: TRADE SHOWS

In an era dominated by the internet, trade shows can sometimes seem a bit outdated. Furthermore, they often involve significant logistical and financial resources for limited periods. However, the fact remains that trade shows represent an important point of contact between machine manufacturers and their customers - major events that very often serve as milestones for new machine launches from all manufacturers.

Europe

2013 is an EMO year, and despite a slight relaxation in the rules preventing exhibition prior to EMO, the number of trade shows held in the run-up to this event is still noticeably low across Europe.

We would like to invite you discover our new products at September's EMO.
Our machining solutions will be on show at the following events:

1	**Medtec**	Stuttgart	Germany	26-28 February
2	**Intec**	Leipzig	Germany	26 February - 1 March
3	**Journées Horlogères Tornos**	Moutier	Switzerland	5-8 March
4	**Mecspe**	Parma	Italy	21-23 March
5	**Metapro**	Brussels	Belgium	19-22 March
6	**Open House Tornos**	Granollers	Spain	April
7	**Industrie Lyon**	Lyon	France	16-19 April
8	**Turning Days**	Villingen-Schwenningen	Germany	17-20 April
9	**Baselworld**	Basel	Switzerland	25 April - 2 May
10	**Open House Tornos**	Coalville	United Kingdom	May
11	**International Engineering Trade Fair**	Nitra	Slovakia	21-24 May
12	**Metalloobrabotka**	Moscow	Russia	27-31 May
13	**Industry Days**	Budapest	Hungary	28-31 May
14	**Mach-Tool**	Poznan	Poland	4-7 June
15	**EPMT**	Geneva	Switzerland	11-14 June
16	**EMO**	Hanover	Germany	16-21 September
17	**Toolex**	Sosnowiec	Poland	1-4 October
18	**MSV**	Brno	Czech Republic	7-11 October
19	**Orthotec**	Regensdorf	Switzerland	23-24 October
3	**Open House Tornos**	Moutier	Switzerland	November
6	**Open House Tornos**	Granollers	Spain	November
20	**Open House Tornos**	St-Pierre-en-Faucigny	France	November
21	**Open House Tornos**	Opera	Italy	November

RUSSIA

Moscow 12

10 Coalville

UNITED KINGDOM

16 Hanover

14 Poznan

POLAND

2 Leipzig

5 Brussels

BELGIUM

GERMANY

17 Sosnowiec

CZECH REPUBLIC

Brno 18

SLOVAKIA

1 Stuttgart

11 Nitra

8 Villingen-Schwenningen

Basel 9

13 Budapest

FRANCE

Moutier 3

19 Regensdorf

HUNGARY

SWITZERLAND

Geneva 15

Lyon 7

20 St-Pierre-en-Faucigny

Opera 21

4 Parme

ITALY

6 Granollers

CHINA

INDIA

10 Mumbai

THAILAND

Bangkok 7

1 Bangalore

AUSTRALIA

MALAYSIA

Kuala Lumpur 8

Sydney 6

Singapour 4

Asa

It is interesting to note that Asian trade shows now enjoy the highest attendance rates, thereby reflecting the global machine tool market. The result is that, in barely ten years, a trade show such as CIMT in Beijing has become one of the world's foremost machine tool exhibitions. For some manufacturers it attracts more than double the number of visitors they see at an EMO show, and over three times as many as a show such as IMTS. The star of these trade shows will be our new Swiss ST 26 product range, which is specifically aimed at the following countries:

1	**Imtex**	Bangalore	India	24-30 January
2	**Timtos**	Taipei	Taiwan	5-10 March
3	**SIMMS**	Shenzhen	China	28-31 March
4	**MTA**	Singapore	Singapore	9-12 April
5	**CIMT**	Beijing	China	22-27 April
6	**Austech**	Sydney	Australia	7-10 May
7	**Intermach**	Bangkok	Thailand	16-19 May
8	**MetalTech**	Kuala Lumpur	Malaysia	21-25 May
9	**EastPo**	Shanghai	China	2-5 July
9	**AMTS**	Shanghai	China	20-22 August
9	**Medtec**	Shanghai	China	25-26 September
10	**Medtec**	Mumbai	India	October
11	**DMP**	Dongguan	China	November
7	**Thai Metalex**	Bangkok	Thailand	November
9	**Open House Tornos**	Shanghai	China	November

1	**MD&M West**	Anaheim	CA	USA	12-14 February
2	**Open House Tornos**	Lombard	IL	USA	21 March
3	**PMTS**	Columbus	OH	USA	16-18 April
4	**Eastec**	Springfield	MA	USA	14-16 May
5	**Feimafe**	Sao Paulo		Brazil	3-8 June
6	**MD&M East**	Philadelphia	PA	USA	18-20 June
5	**MDM**	Sao Paulo		Brazil	26-27 August
7	**Westec**	Los Angeles	CA	USA	15-17 October
8	**Open House Tornos**	Bethel	CT	USA	17 October
9	**MD&M Minneapolis**	Minneapolis	MN	USA	29-30 October

7 Los Angeles
1 Anaheim

Americas

Tornos is delighted to announce the opening of brand new offices in Brazil, where the company's new structure will enable us to offer our range of services to our Brazilian customers. Our USA team looks forward to welcoming American customers to our stands where, among other things, they will be able to see our new Swiss ST 26, a high-performance bar turning machine!


9 Minneapolis
Springfield 4
Bethel 8
2 Lombard
Philadelphia 6
3 Columbus
USA
BRAZIL
Sao Paulo 5

COSTCUTTER

OD GROOVING INSTEAD OF SINGLE-POINT TURNING CUTS YOUR PART COSTS BY 40 %!

- Several systems for cutting width from 3 to 70 mm
- Polish like surface finish quality of the insertable tool
- For use on single spindle, multi-spindle lathes and turning / milling centers
- Increase in productivity by up 80 %

www.schwanog.com

schwanog

MACHINING MEDICAL PARTS – NEW DEVELOPMENTS THAT LIFT PERFORMANCE

Cutting tool concepts have been introduced recently to make the machining of small parts for the medical industry considerably more efficient, improving productivity. As sliding-head machines in particular evolve for small-part machining, also cutting tools evolve to provide the performance needed for high utilization of machines. Several tool areas have new performance levels – thread whirling and turning with high-pressure coolant are two outstanding examples.

Recent tool developments, such as the CoroMill 325 thread whirling cutter has made an advantageous thread-generating method even better. Thread whirling is an effcient, secure and accurate way to generate threads. New cutter concept and indexable inserts provide considerable advantages for parts such as bone screws.

Established method upgraded

High-volume production of long, slender screws in high-performance metals, such as bone screws, is on the increase as is the competitive pressure in manufacturing. This is typically the case for suppliers to the medical industry where items such as these are machined in growing volumes and where thread whirling is an established method. The inherent stability of the process makes it suitable for machining high volumes and demanding metals.

The advantage is considerably longer tool-lives, which means less machine down-time in production. Also the toughness of the cutting-edge line can be improved to enable a sharper edge to be used and for it to be more secure. Taking advantage of the machining advances in other machining areas and developing specific indexable inserts and cutters for whirling small parts lead to improved manufacturing-economic advantages for medical components.

Turning with precision coolant jets has undergone considerable development over some time in various machining applications. The technology is now regarded not just as a problem solver but a means to really optimize performance for a number of parts in the medical industry. The CoroTurn QS-HP concept combine quick, secure tool changing with high-pressure coolant application for turning small parts.

Developments in inserts has provided the means for a new take on cutting edges to draw more advantage of the benefits of the thread whirling method. Coated cemented-carbides, for examples, have resulted in much longer and more predictable tool-lives as well as the possibilities of higher cutting speeds. This has resulted in higher production out-put with parts consistently within tolerance and finish levels. New insert grades, such as one with PVD/TiAlN coating, have a unique thin coating-layre with very good adhesion to the insert-substrate. The grade has proved particularily advantageous for the keen edges necessary for thread whirling materials such as used for bone screws.

Operating security and tool handling are additional essential features for acheiving higher machining performance in thread whirling. Tool precision determines the quality of insert seating, insert grinding and the ease and reliability in locating the insert correctly every time. Newly developed insert-clamping for thread whirling cutters has improved the accuracy of cutting edge positioning, the machining security and the ease and time with which the tool is changed in the machine. A smooth tangential cutting action is necessary to ensure the high accuracy and surface finish demanded throughout the process.

Thread-whirling cutters today should include specially developed precision-ground inserts and blanks should be compatible with most types and makes of sliding-head spindles. Although a well-established process for high-volume production, meeting higher production and new component demands needs the new tooling technology for more advanced ring concepts in thread whirling.

In one manufacturing example of thread-whirling bone screws, involving volumes of around half-a-million per year in varying small batches, installing the modern indexable-insert tool led to cost-savings in machining that considerably improved the competitiveness in manufacturing. The new tool meant a tool-life of nine times more components being machined before the cutting edge needed changing, when the part-dimensions were on their way out of tolerance. In addition to all the machine-stoppage time being eliminated, substantial tool-room time was saved thanks to the ease of cutter maintenance.

Advanced coolant application solves problems

The coolant supply available in sliding-head machines today offer new possibilities for improved production of small parts. Replacing the conventional flow of coolant in the machining zone by a high-pressure coolant system provides various machining advantages. The introduction of this assisted means of cutting need not entail complicated, elaborate installations as standard tooling is available and internal coolant supply is common practice. High-pressure-coolant machining has been developed continually for some time, resulting in today`s qualified concept. The big advantage is in improving performance and chip evacuation when machining materials that are demanding from a chip-control point of view, such as superalloys and low-carbon steel.

The application of a tooling concept for accurately directing jets of high-pressure coolant into the cutting zone is now available for small part machining. Today`s solution combine that of precision-directed coolant jets with simplified and secure toolholder-clamping. This opens up a new perspective for more efficiently machining demanding materials, especially in sliding-head machines where gangs of small tools are in very confined spaces and are often difficult and time-consuming to change and set. Both machining and tool-changing is improved with the new system of tool holding in the machine that is equipped with location, locking and connections for the coolant.

The turning tool with high-pressure coolant typically has three nozzles directing coolant jets to where they are most needed. The coolant affects how the heat generated in the cutting zone is distributed, the amount of tool wear generated, how chips are actually formed and also the amount of smearing of workpiece material that will occur on the cutting edge. The coolant jets effectively shorten the contact length through forming a hydraulic wedge between chip and rake face on the cutting edge. This has a proven effect on both tool-life and chip formation. Chip control in the machine for secure un-maned production, tolerance and surface finish levels on the machined component, with manufacturing productivity improved as a result.

The high-pressure coolant system is easy to apply in a machine for small-part machining and tools are easily and quickly changed. This is through clamping and release of the toolholder by just one screw and a spring-loaded wedge that secures the holder in the tool-post. Accurate and secure positioning of the cutting edge is obtained when the toolholder is set-up and changed. Combined with internal coolant supply in the holder and a simple, safe connection between holder and tool-post, problem-free machining of demanding, long-chipping materials has become a readily acquired means for machining parts in the medical industry.

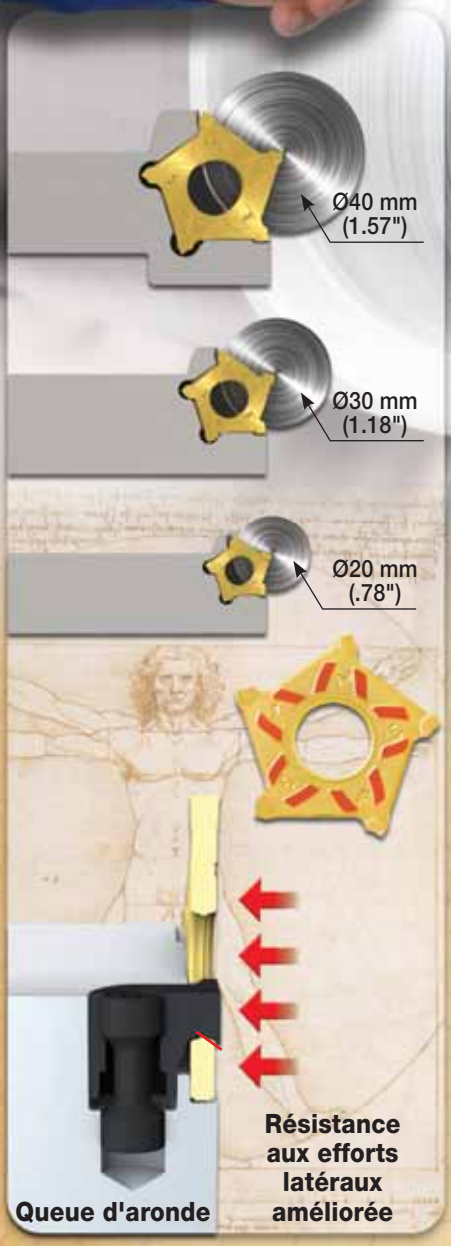
The single-screw release of the QS-HP quick-change toolholder usually reduces tool change times to less than a third - typically from three minutes to one minute. The clamping wedges ensure quick and safe extraction of the tool and reduce the risk of dropping it during handling. Once in the machine, the insert-edge position is automatically set by contact between the short holder and the stop. When front and back turning is being performed, the secure insert-edge position will typicall improve accuracy through an average of 30% less tool movement.

SANDVIK Coromant

Christer.Richt@Sandvik.com
www.sandvik.coromant.com

PENTA IQ GRIP

NOUVEAU
PROF. DE COUPE MAXI
20 mm



Gamme BRILLANCE

Tronçonnage
Gorges

Nouvelle plaquette
à 5 arêtes de coupe

- Conception robuste pour une meilleure résistance aux efforts latéraux
- Serrage de plaquette en queue d'aronde pour un contact plus efficace entre la plaquette et le corps
- 3 tailles de plaquettes pour une plus grande plage de **diamètres de tronçonnage:** 20, 30 et 40

Member IMC Group
ISCAR
www.iscar.ch

HIGH Q LINE

A MILLION TIMES, PRECISELY: EASYDEC TIMEPIECE COMPONENTS

The bar turning company Easydec, which has its headquarters in Delémont, Switzerland, has really found the key to producing incredibly small turned parts. As a supplier to the leading watchmakers, the company specialises in large-scale production runs. According to company owner Didier Rebetez, innovative quality management and pioneering business philosophies are the key factors to success.

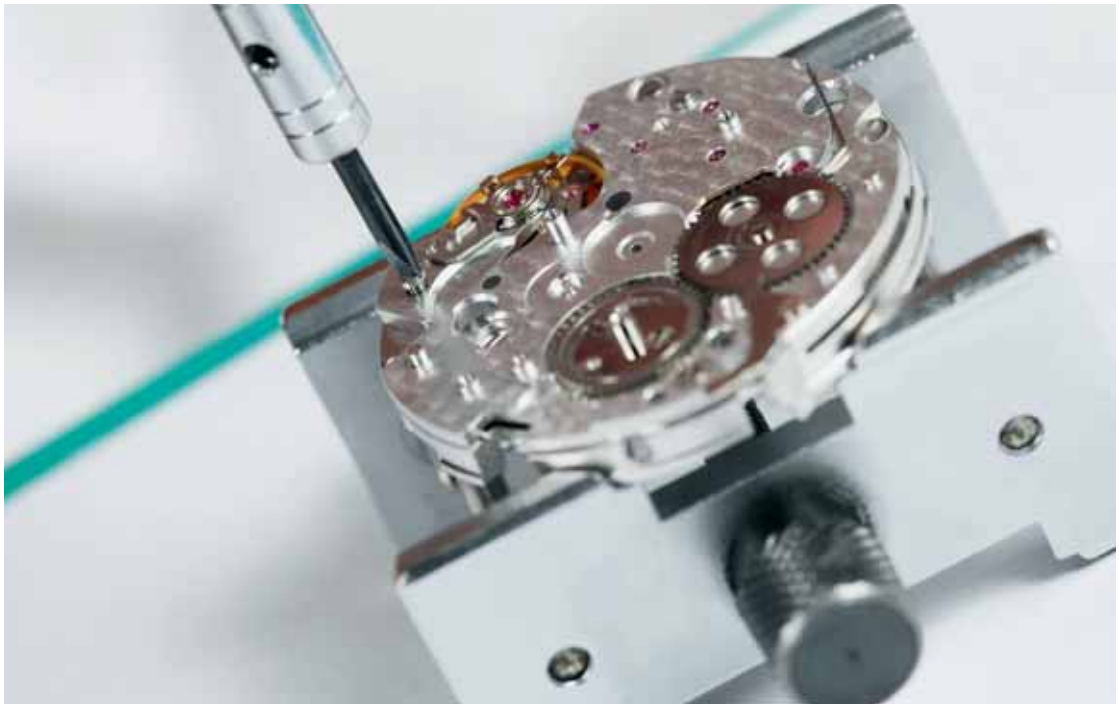


Photo: igpyphoto-fotolia.com

This demands the highest degree of precision: Precisely machined watch components and technically outstanding solutions are the foundation of the big Swiss export hit, the high-quality watch.

The smallest movement manufacturers invest in high vertical integration within their own company – the majority of components come from high-productivity suppliers in the region. As is the case in other industry sectors, there is currently demand for the highest quality coupled with competitive prices. This requires both a number of success factors and an integrated approach to production operations.

Only the best is good enough

Easydec is dedicated to constantly improving all its processes. By precisely measuring quality and industrial performance, it takes no time at all to track down the sources of errors and eliminate them. Today, production takes place over two floors, using around 50 Tornos CNC machines (Tornos Deco 7/10/13/2000/Micro 8). The computer-aided quality control system QuickControlPro® is used as part of the production process. To put it simply, all 50 machines are monitored continuously and manual sampling is used in order to measure dimensional accuracy. Quality control officers are constantly at work performing this task throughout the whole factory. The measurement results recorded are evaluated by the software and represented graphically. The results are clearly visible simultaneously on both production floors on a large screen. The production situation of each machine is

An impressive number of Tornos CNC bar turning machines are at work around the clock here on the first floor.

represented on a time axis. Red phases are used to indicate suggestions for improvement. If these are implemented, the bar chart then lights up green.

Exacting on all levels

"In order to be one of the best, these days companies must be exacting on all levels", explains Didier Rebetez in his interview with us. Of primary importance, he considers staff to be one of the secrets to success. In addition, all Easydec bar turning machine operators are skilled in the latest machining techniques, such as polygon turning, milling, thread-whirling and knurling. Of course, the machines are equipped with the facilities necessary to practise these techniques. The Tornos machine inventory perfectly satisfies the company's needs, running 24 hours per day with an extremely high output. However, the machines must still be operated with the appropriate specialist knowledge and must be properly maintained.

Motorex on the first floor

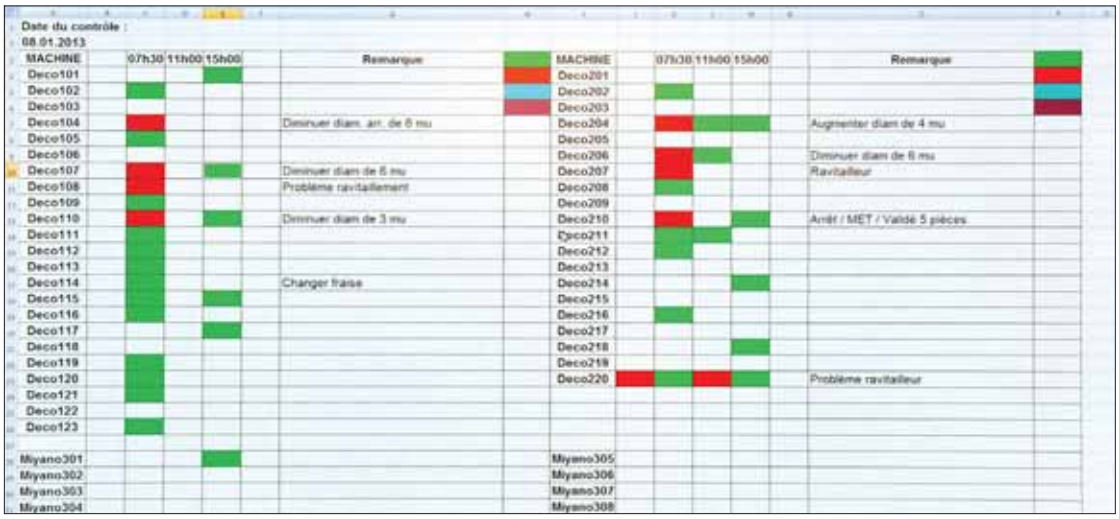
In their search for the best solution, it did not take long before Easydec struck gold in the lubrication technology sector. Tornos' close collaboration with Motorex meant that the choice was obvious, and as the company expanded, the 22 machines on the first floor were filled with Motorex Ortho TX. This cutting oil is free of both chlorine and heavy metals and is more than capable of meeting the highest demands; even in the most difficult machining processes, using the widest variety of materials, it always guarantees top results. Motorex cutting oils' very low volatility and mild odour is highly appreciated by the employees. In addition, Ortho TX has neither a tendency to foam, nor does it generate excessive oil mist in unfavourable working conditions.

The changeover pays for itself

A particularly positive secondary effect of the changeover to Motorex is an almost 80% improvement in tool life for a mass-produced part (a 1.19 mm long

Here, an Easydec quality control officer is taking a sample of the screws to be measured on one machine.

Many precision turned parts for watchmaking, such as these screws that are only 1.19 mm long for mechanical movements, are barely visible to the naked eye.



Date du contrôle : 08.01.2013									
MACHINE	07h30	11h00	15h00	Remarque	MACHINE	07h30	11h00	15h00	Remarque
Deco101					Deco201				
Deco102					Deco202				
Deco103					Deco203				
Deco104				Diminuer diam. arr. de 6 mu	Deco204				Augmenter diam de 4 mu
Deco105					Deco205				
Deco106					Deco206				Diminuer diam de 6 mu
Deco107				Diminuer diam de 6 mu	Deco207				Ravitailleur
Deco108				Problème ravitaillement	Deco208				
Deco109					Deco209				
Deco110				Diminuer diam de 3 mu	Deco210				Arrêt / MET / Validé 5 pièces
Deco111					Deco211				
Deco112					Deco212				
Deco113					Deco213				
Deco114				Changer fraise	Deco214				
Deco115					Deco215				
Deco116					Deco216				
Deco117					Deco217				
Deco118					Deco218				
Deco119					Deco219				
Deco120					Deco220				Problème ravitailleur
Deco121									
Deco122									
Deco123									
Miyano301					Miyano305				
Miyano302					Miyano306				
Miyano303					Miyano307				
Miyano304					Miyano308				

The measurement results serve as the basis for calibration to be carried out on the machine. All the steps and the current machine status are displayed on the machine.

20 AP steel screw)! At Easydec, mass-produced means production runs of between one hundred thousand and four million parts! The outstanding result following the changeover was reason enough to change over to Motorex for slideway oil and hydraulic oil too. All of the industry lubricants are also tested for their compatibility. This means that the customer is presented with a thoroughly tried-and-tested solution and enjoys the utmost process reliability.

The final inspection confirms the strategy

Following cleaning, the bar turned parts undergo a final inspection in accordance with the relevant standards. In this inspection, four people ensure the quality and document it in accordance with the relevant standards requested by the customers. Through the use of the quality control system and the "flying" visits from the quality control inspectors, the

Using the latest measurement technology, the parts are optically measured and the values are evaluated using the quality control system with the QuickControlPro® software.

In the recently constructed, ultra modern company buildings in Delémont, the machines operate over two floors around the clock.

bar machine operators are also constantly aware of the need to produce high-quality parts. As already mentioned, this enables weak points to be quickly detected and eliminated in the entire process. In the near future, sensors in the CNC machines will also automatically measure various parameters that provide information on the current quality and performance values. But this is all still a long way off, enthuses the company's head.

Would you like to know more about the new generation of Ortho cutting oils, the optimisation possibilities in your field of application and what Easydec can offer you? Then contact us at:

Ercole Masello, Technical Sales Representative Motorex AG Langenthal, advised Easydec when they switched over to Motorex machining fluids and on all aspects to do with lubrication technology.

easyDec

Easydec SA
Precision turned parts for watchmaking
Rue St. Sébastien 22
CH-2800 Delémont
Switzerland
Tel. +41 (0)32 421 06 06
Fax +41 (0)32 421 06 07
www.easydec.ch

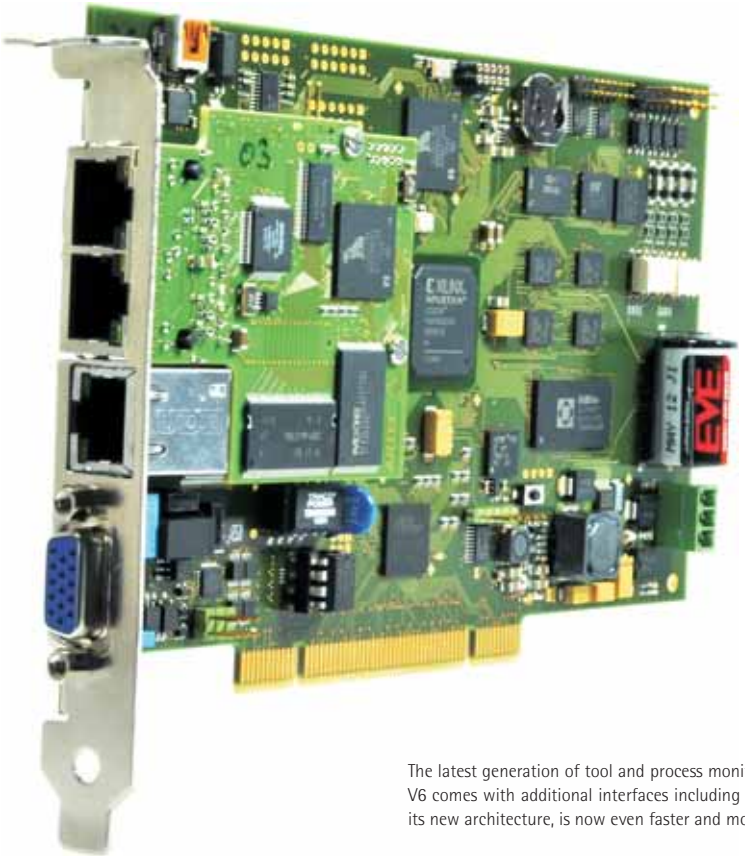
MOTOREX
Oil of Switzerland

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

CTM V6 – OPTIMAL PROCESS MONITORING LINKED TO THE MACHINE

ARTIS now sets a new standard in machine process monitoring with its new CTM V6.

Behind the acronym hides the latest development of the proven CTM process monitoring technology. The ARTIS experts have once again significantly augmented the functions of the successful CTM plug-in cards. The renowned Swiss company, the Tornos Group are among the primary users and are providing the impetus for the development.



The latest generation of tool and process monitoring from ARTIS: The CTM V6 comes with additional interfaces including Ethernet, and as a result of its new architecture, is now even faster and more flexible.

"This system meets our needs without a doubt", says Massimo Tidei, Automation Product Engineer for the Multi-spindle range at Tornos. The long-established Swiss machine manufacturer, which has its headquarters in Moutier in the west of Switzerland, is considered one of the top suppliers of automatic turning and machining centres in the world. Tornos'roots extend as far back as 1880. It was at this time that the first automatic turning machine left the machine tool factory in the Bernese Jura, region. Today, Tornos employs around 600 employees globally and recently generated a turnover of 271 million Swiss Francs.
Tornos was one of the first to adopt the new generation of CTM process monitoring systems and assisted in the redevelopment of ARTIS by carrying out extensive practice tests. The result is the new CTM technology is already successfully being used in France by the first Tornos customers. Frank Bonas, Product

coordinator for the CTM system at ARTIS, summarises the advantages: *"The new CTM card is faster, boasts even better performance and offers new possibilities through further interfaces."*

THE FEATURES OF THE ARTIS CTM V6 MONITORING SYSTEM

- Tool and machine protection
- Tool breakage and missing tool monitoring
- Tool wear monitoring
- Automatic process control (adaptive control/optional)
- Reduced cycle times
- Digital torque measurement (DTA)
- Optimal exploitation of tool life
- Process analysis using statistics and process documentation (optional)
- New interfaces: Profibus DP (12 Mbit/s), Ethernet, Profinet

ARTIS specialises in the development and production of systems for process and tool monitoring. This includes both the hardware components, such as the CTM plug-in card and the visualisation software. The technology developed by the company, which was established in 1983, is used for quality assurance and reducing the costs per unit. Globally, there are currently over 14,000 CTM systems installed and in use, particularly in the aerospace and automotive industries. Another process monitoring system, Genior Modular, is primarily used for large-scale production.

"ARTIS provided us with an excellent level of support throughout the entire test series," says Tornos expert Massimo Tidei. He also awards top marks for the performance of the new card, which fulfilled, or even exceeded all their expectations.

CTM V6 – greater performance, greater possibilities

Speed, for example, is a deciding factor in tool breakage monitoring. The sooner a process fault is detected and the sooner the machine is stopped, the less damage is likely to be caused. In fact, the ARTIS developers were once again able to significantly improve the new card's reaction time. This may be attributed to, the computation processes in the CTM V6 and a new card architecture.

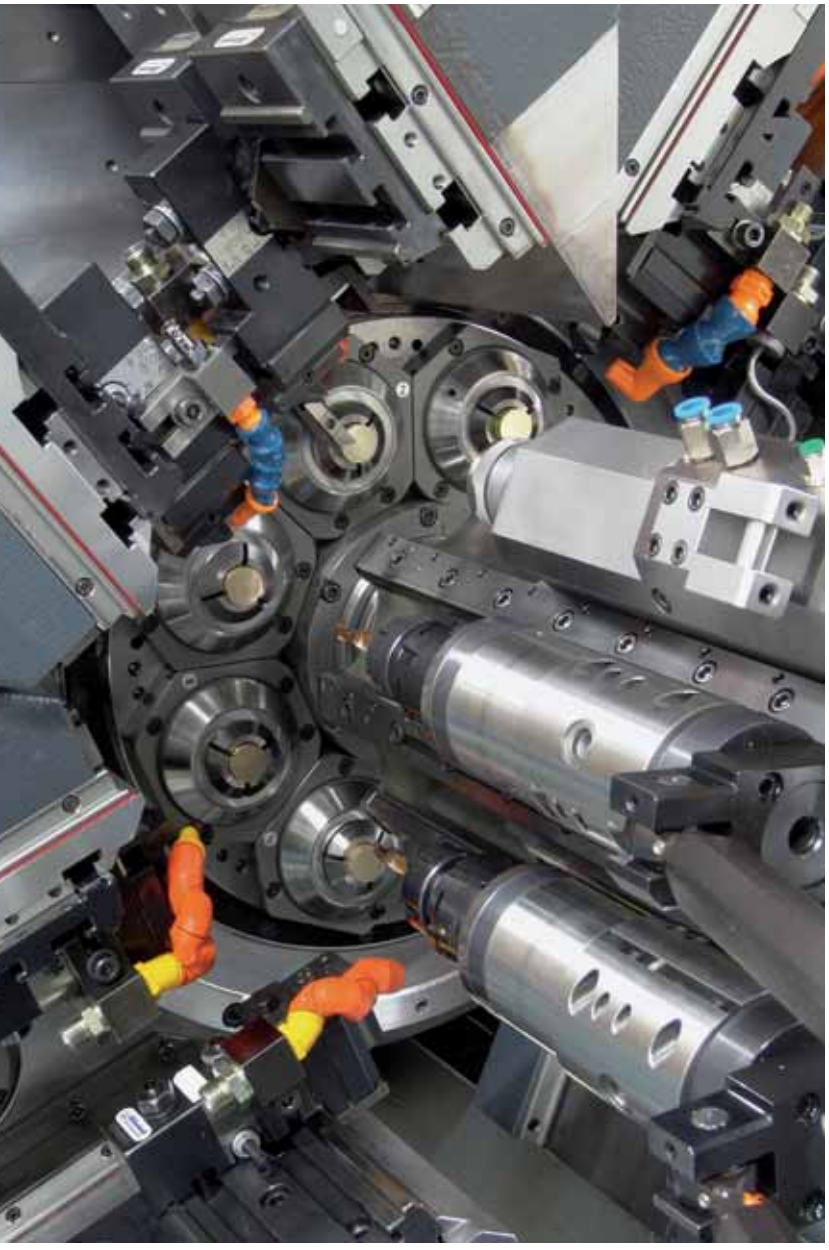
Lag-free communication with the machine

The use of an even more direct connection has enabled developers to also recoup time in communication between the process monitoring system and the

The MultiSigma multi-spindle automatic turning machine is the first machine for which Tornos is using the new CTM V6, manufactured by ARTIS.

machine: *"There is now virtually no time lag in the exchange of information between the process monitoring system and the machine,"* says Frank Bonas.

One reason for this, is the new card has a broader range of interfaces. Depending on the requirements of the machine manufacturer, circuit boards can be used to provide Profibus, Ethernet or Profinet connections. As a result of a new electronics architecture, all connections are made directly on the card. *"The system can be optimally integrated into our machine environment,"* says Massimo Tidei.



The MultiSigma's machining room. The tools are reliably monitored using ARTIS' and the processes are thus safeguarded.

Proven digital torque measurement

A further feature of the CTM V6 is that the system also boasts the proven ARTIS digital torque measurement system, DTA (Digital Torque Adapter) for short. ARTIS developed this technology and is a leader in this area. The system allows the motor output to be visualised directly on the machine control unit terminal. *"No additional sensors are required here. The system is extremely flexible. At the click of a mouse, it is possible to change over from one axis to the other, or from one spindle to the other. This was inconceivable before",* says Tidei. The quick launch into optimal process monitoring impressed the Tornos engineer: The 'Self Adjusting System' (SAS) automatically adjusts the essential parameters and learns over the course of the process. It therefore enables rapid start-up of the process monitoring system.

In the meantime, the new system has successfully been implemented for production applications in the MultiSigma and MultiAlpha Tornos machine models. Several customers are already using the innovative technology. The next step is now to integrate the system into the Tornos MultiSwiss machines; the MultiSwiss is a new kind of machine that combines the advantages of single and multi-spindle machines. In Massimo Tidei's words: *"The decision to collaborate with ARTIS was easy. ARTIS offers one of the best tool monitoring systems, and it is also the most commonly used in our sector. ARTIS has an excellent reputation in process irregularity detection."*

ARTIS is part of the Italian MARPOSS Group, which distributes the systems in over 25 countries.

ARTIS
MARPOSS

ARTIS GmbH
Sellhorner Weg 28-30
D - 29646 Bispingen – Behringen

www.artis.de
kerstin.rogge@artis.marposs.com
www.marposs.com

New CoroDrill®870
Not just different, outstanding!

Exchangeable-tip drills have been around a while, they are nothing new. Neither are the problems they can have. CoroDrill 870 is something different, a whole lot different, a new generation of exchangeable-tip drill.

So how is it different? Well, we fixed the interface between drill body and tip. It fits perfectly and securely so you don't have to worry about precision being an issue.
Changing the tip is fool proof, (you could probably do it blindfolded, although we don't recommend it), maximizing actual machining time.

A smart drill flute design together with the geometry makes light work of chip evacuation.

We made sure the design optimizes your applications through diameter range, steps, and length possibilities, so holes can be made more efficiently and closer to your requirements, leaving them better prepared for the next job.

Oh yes and with the new grade you won't have to swap the tip that often.

Scan the code and read more tips for improved holemaking!

SANDVIK Coromant

Your success in focus

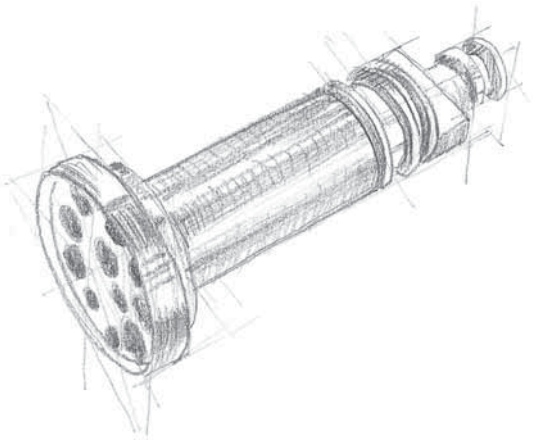
www.sandvik.coromant.com/ch

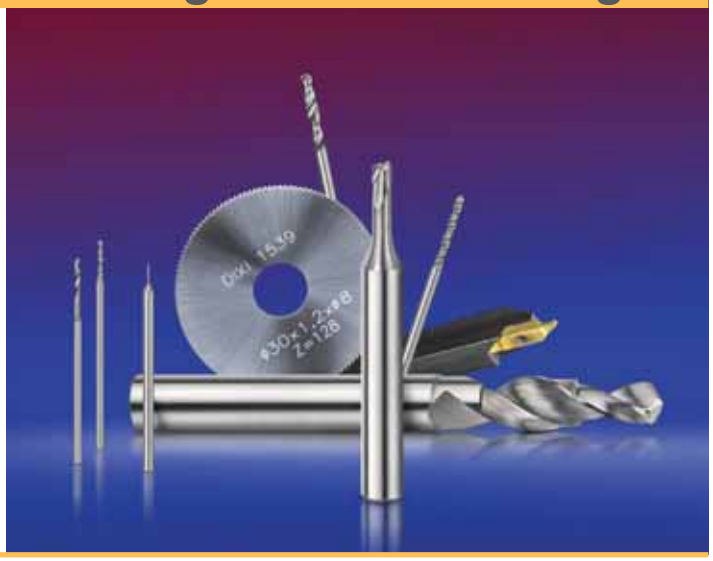
DIXI

4

Tungsten carbide and diamond precision tools

Turning-screw cutting





Our know how compliments your experience

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

SUBCONTRACTOR BUYS HI-SPEC TORNOS BASED ON YOUTUBE FOOTAGE

Starting a machine shop at the age of 24, in the run up to a recession undoubtedly shows the desire of Hi-Spec Engineering Ltd's Director Mr Darren Grainger to run his own business. However, renting a unit, buying his first three manual machine tools for a total of £3,500 and building the business whilst working a full time post at another company shows the maturity and determination to succeed.

Now, Darren has taken Hi-Spec to a company with 10 employees and a plant list that includes Haas and Hurco CNC machining centres and Colchester turning centres. However, Mr Grainger is keen to keep abreast of technology to build his business further. So, it was very apt that when Hi-Spec needed a new CNC turning centre, the decision was based primarily on video footage watched on video streaming website YouTube.

As Mr Grainger recalls: *"We had an increasing demand for smaller diameter work that our existing CNC turning centres were not geared for. Additionally, we were having reliability issues, so the acquisition of a new and smaller turning centre would cater for the new work and ease the load on less reliable machines whilst improving lead times. We knew MACH 2012 was around the corner, but couldn't afford to take more than a day at the show investigating the available machines. I started to investigate all the leading machine tool suppliers online and watched numerous video footage. It was the footage of a Tornos Gamma on YouTube that took me straight to their stand at MACH 2012. I was given a demo to confirm that it could do everything I had seen in the YouTube video and I shook hands on it with Tornos on the very first day of the show"*

Six months down the line and Mr Grainger is not only delighted with the acquisition, but can also confirm why he opted for the Tornos as opposed to an alternate sliding head centre: *"From the YouTube footage we could see the Gamma 20 would be well suited to our small parts. When we investigated further and compared to competitor machines we identified a number of aspects that made the Gamma a better buy."*

"Firstly, the Gamma 20 had high pressure coolant as a built-in unit whereas alternate machines only offered this as a bulky add-on feature. Secondly, the Tornos was the only machine to offer a guide-bushless system for working closer to the headstock. This delivers improved rigidity and flexibility as well as the ability to reduce bar remnants by up to 20%, which is considerable with the increasing material costs. Furthermore, the Gamma 20 also offered more tooling positions and more driven head tooling stations as standard. All this made the Tornos a more cost effective and attractive solution for us, a company taking its first step into the sliding head market," says Mr Grainger.

As a manufacturer of components and assemblies for the hydraulics, automotive and agricultural industries, producing valves, fittings, cylinders, power packs and drive couplings, the daily work schedule at Rutland based Hi-Spec can entail small to large batch sizes from a variety of material types. With batches that can range from 10 to 2000 in the turned parts department, the Tornos has slotted into the production flow perfectly at Hi-Spec. As Mr Grainger states: *"As soon as we transferred parts from our fixed head CNC turning centres to the Gamma, we noted productivity gains upward of 50%. We had one particular set of 20 mm diameter pins that required rear-end turning and grooving. On our fixed head machines, the part was taking 90 seconds and was breaking a lot of inserts when grooving. The Gamma transferred this troublesome part by producing it in 20 seconds with no vibration or tool breakages. This regular batch work fell from 1.5 days to two hours work."*

This scenario was mirrored on a relief screw for a hydraulic assembly. The 13 mm diameter, 90 mm long screw previously took 4 minutes to machine with multiple set-ups. The screw is now machined on the Gamma 20 in one-hit in 90 seconds, taking the job from two days to a couple of hours.

On one part that required hexagonal machining with a thread at either side; Hi-Spec used to turn the part in 3.5mins and then transfer to a Haas machining centre for 4 minutes of milling with engraving on multiple surfaces. This regular batch of 1500 parts would be a loss leader for Hi-Spec, as it supplied this particular customer with large quantities of work. Now, the job is profitably machined in one-hit in 90 seconds on the Tornos Gamma.

As Mr Grainger recalls: *"We have a long string of jobs where the Gamma has slashed cycle times compared to our fixed head machines, but the benefits are further reaching. We have equipped the Gamma for short batch runs by rationalising on bar diameters, using 12, 16, 20 and 22 mm diameter stock. We also have enough tool positions to have two roughing tools, two finishing tools as well as grooving and threading tools permanently set-up in the machine. This gives us a rapid set-up and turnaround time for jobs and dismisses the belief that sliding head machines are only for large batch runs."*

In comparison to the larger fixed head machines, the Gamma 20 slashes production times by having the tool positions close to the workpiece to reduce non-cutting times. Additionally, the extremely capable back-end set-up permits simultaneous machining on front and rear spindles. Despite, the size difference between the Gamma and the larger fixed head machines, Hi-Spec has been overwhelmed by the rigidity and precision of the Gamma. On the Gamma 20 at Hi-Spec, the roughing tools are machining at 5-6 mm depths of cut on free cutting steel. Furthermore, the company has produced almost 30,000 parts on the Gamma since its introduction and only used 35 turning inserts and 23 part-off inserts. As Mr Grainger continues: *"The reduced vibration through the rigidity of the machine and working close to the collet as well as the ability to run the jobs at higher speeds and feeds to suit the tooling parameters has saved us considerably on tooling costs."*

"The Gamma has allowed us to accept more work from customers and it has given us significantly more capacity. The quality and surface finish of the parts has improved, as has our ability to meet tight tolerances. Another mark of quality in the Gamma is its 'warm up' period. I can turn the machine on in the morning and it is ready to run parts to tight tolerance whereas our other machines need up to an hour to warm up. The benefits are so far reaching, my only regret is not buying a Tornos sooner," concludes Mr Grainger.

The YouTube footage that persuaded Mr Grainger to acquire the Tornos Gamma, can be seen at:

http://www.youtube.com/watch?v=k2bosuHkkvs&list=UUvrtPNvScqReGm2rXURgQjQ&index=50&feature=plcp

Hi-Spec
Precision Engineering Ltd

Hi-Spec Precision Engineering
Units 4-5 Thistleton Block
Market Overton Industrial Est
Ironstone Lane
Market Overton
Rutland LE15 7PP

info@hi-speceng.co.uk

Pinces et embouts · Zangen und Endstücke · Collets and end pieces

for

LNS, TRAUB, FMB, IEMCA, CUCCHI
TORNOS, BECHLER, PETERMANN

ANDRÉ FREI ET FILS SA

Rue des Gorges 26
Tél. +41 32 497 71 30
www.frei-andre.ch

CH-2738 Court
Fax +41 32 497 71 35

MULTISPINDLE TURNING OF THE HIGHEST QUALITY

AS CLEAN AS THEY COME

The Kärcher company, based in Winnenden, Germany is the undisputed world leader in the cleaning apparatus sector, with its inventiveness, outstanding performance and innovative solutions ensuring it stands apart. With 8.25 million devices sold every year, the company sets standards in both the professional and private market. Innovation and quality are the prominent driving forces behind its growth. This is also true of the in-house production which, in terms of precision and productivity, is hard to beat. When producing the triple nozzle for professional high pressure cleaners, Kärcher places its trust in a Tornos MultiAlpha 8x20 CNC multi-spindle automatic turning machine and uses this to achieve impressive results.

Alfred Kärcher was one of the many inventors and entrepreneurs to emerge from Württemberg since the beginning of industrialisation – along with Robert Bosch, Gottlieb Daimler and Graf Zeppelin. He showed great dedication in bringing his ideas to fruition. In 1924, the 23-year old concluded his studies at Stuttgart technical university and started work at his father's marketing company, which he developed into a design office. In 1935, the engineer founded his own company in Stuttgart-Bad Cannstatt in order to manufacture and market for himself his product ideas in the heating technology sector.
Amongst other things, Alfred Kärcher constructed and built the so-called "Kärcher salt-bath furnace", to his own patent, for tempering steel and hardening light alloys for industrial use. 1950 saw the start of the company's unstoppable rise in heating technology, with the development of the first European hot

water high pressure cleaner, the DS 350. This design for heating water proved to be so forward-looking that it is still used as the basis for all burners today. However, this just lit the fuse that produced an explosion in innovation.

Every year without fail, numerous new products were launched, and 1270 patents have been registered to date. Furthermore, global cleaning projects gave rise to new processes. For example, the 284 travertine columns in St Peter's Square in Rome were restored using a blasting process specially developed for this task – a total surface area of 25,000 m². Since 2009, Kärcher has sold high-pressure cleaners that can not only clean but also renovate facades and strip concrete with pressures of up to 2,500 bar. The name Kärcher has become synonymous with sophisticated cleaning devices across the globe.

A seemingly unsolvable problem…

The professional equipment, amongst other products, is produced at the headquarters in Winnenden. One of the key components, which ensures it stands apart from the competition, is the triple nozzle fitted to unheated professional high-pressure cleaners. By simply turning the nozzle, the user can switch between a high pressure, flat jet or low pressure spray.

Until two years ago, these nozzles were made from brass and procured from one supplier.

Due to the constantly increasing demands, this material was slowly reaching its limits, so process engineer Gunther Laube, Uwe Bareiß, turning shop team leader and shift manager Kurt Schneider started looking for suitable alternatives. All three men are "Kärcher veterans", shaped by the spirit of the company. This ensured they searched for solutions and worked tirelessly to find the best result in the competent, pragmatic and hard-working way their region is famed for.

The Kärcher manufacturing specialists started with two main aims.

The first was for the entire manufacturing process to be brought back in to the company. The second was for stainless steel nozzles to be created with a patented inner contour that could produce a more efficient high pressure flat jet, which had previously never been managed with a drilling depth of 6xD and in stainless steel.

This was a particular challenge for Gunther Laube and his colleagues.

To produce the nozzles, sophisticated drilling and milling operations to considerable depths are required and must be carried out with extreme positional accuracy. Each drill hole requires a machining process with at least three to four tools, most of which need internal cooling. For financial reasons and to ensure the position accuracy, the entire process must be carried out on a single machine.

Brilliantly solved

In this phase, numerous machines were evaluated and numerous trials were conducted. It soon became apparent that the engineers at Tornos were the right partners. Initially, the contours were tested on Almac machines and CNC sliding headstock machines and the process know-how was collated. To achieve the required quantities, a MultiAlpha 8x20 CNC multi-spindle automatic turning machine was finally considered.

This is the only machine that has sufficient tools to finish the part in a single clamping arrangement. On this machine, test machining was carried out using brass and for a long time, Tornos assumed that this material would also be used in the final process. But Gunther Laube had higher goals, and once production had been sufficiently assured with these

preliminary tests, the next step was taken using stainless steel. This is where the skills of Uwe Bareiß and Kurt Schneider came fully into play. Together they developed new devices, built a special Y-axis and, in consultation with the product managers at Tornos, undertook some more product modifications.

"It really brought the sweat to our brows" says Gunther Laube, looking back. *"We sometimes doubted whether the repeat accuracy of the precisely coordinated machining operations would be sufficient. But we kept on working to optimise the production process. In this phase, we really learnt to appreciate working in partnership with Tornos".* This highly complex project was a special challenge for both parties. Finally, the operators also had to adjust to completely new processes. They underwent intensive training for their task in Moutier and got up to speed in record time. When you consider that six tools are constantly in use and the corrections for one tool have an immediate effect on the entire process, you can appreciate what kind of pressure the operators are under. Especially as the load on the tools is substantially higher when using stainless steel.

Meanwhile, the MultiAlpha 8x20 runs like Swiss clockwork with part production times that are actually below the set target. This means Gunther Laube and his team can manufacture additional parts on the machine and relocate yet more products back to the factory.

KÄRCHER

Alfred Kärcher GmbH & Co. KG
Alfred-Kärcher-Strasse 28 – 40
71364 Winnenden
Tel: +49 7159 14-0
info@de.kaercher.com
www.kaercher.com

TORNOS

Tornos Technologies
Deutschland GmbH
Karlsruher Strasse 38
75179 Pforzheim
Germany
Tel: + 49 7231 9107 0
info@tornos.com
www.tornos.com

MULTIPLY 0.8 SECONDS CHIP TO CHIP TIME WITH 30 PARTS PER MINUTE. RESULT: DELIGHTED CUSTOMERS

TORNOS MULTISWISS

Revolutionary: The new MultiSwiss 6x14 achieves peak performances in terms of both speed and precision. 6 spindles, 1 counter spindle, 14 controlled linear axes, 7 C axes and up to 18 tools bridge the gap between single and multi-spindle lathes. You will achieve low part costs and consistently high quality on small and large series of turned parts in diameters of up to 14mm.
To the delight of your customers.
TORNOS S.A., Moutier, Switzerland
www.tornos.com, www.multiswiss.info

TORNOS
THINK PARTS **THINK TORNOS**

AUTOMOTIVE - MEDICAL - ELECTRONICS - MICROMECHANICS

SPIDI rollier

SPIDI Rollier SA
27, rue des Buttes
FR-74300 Cluses

Tél. +33(0)4 50 98 02 09
Fax +33(0)4 50 96 28 28
spidirollier@spidi-rollier.com

SPIDI Rollier, représentant exclusif des produits Bimu pour la France depuis le 1er février 2013

Nouveau catalogue disponible

Bimu
cutting tools & accessories

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

stampfli
PRECISION TOOLS

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

APPLITEC

SWISS TOOLING

SWISS MADE

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

WWW.APPLITEC-TOOLS.COM