DECO Magazine 36

1/06
MARCH
ENGLISCH

THINK PARTS – **THINK TORNOS**

Manufacture Roger Dubuis: the perfect marriage between tradition and modernism

A multi-spindle turning machine for the watch making sector

100 % pre-setting for increased productivity

The After-Sales Services: common aim

Excalibur by Manufacture Roger Dubuis

Round case, 18-carat polished and satin-finished grey gold, diameter 45 mm, bottom engraved with RD and sapphire openings, crown protection, water-tight to 30 m.

Dial white mother-of-pearl, appliques in 18-carat grey gold.

Hands in 18-carat grey gold.

Real, hand-sewn crocodile bracelet, stretch clasp with RD in 18-carat grey gold.

Calibre movement RD01, mechanical, manual rewind, 16_‴ lines, 50 rubies, rhodium plated, "Côtes de Genève" décor.

Specification: dual tourbillon wheel with differential, power reserve indicator.

Functions: jumping dial watch, retrograde dragging minute, seconds by tourbillon index.

Production: 28 copies.

IMPRESSUM
DECO-MAGAZINE 36 1/06
Circulation: 12000 copies

Industrial magazine dedicated to turned parts:

TORNOS S.A.
Rue Industrielle 111
CH-2740 Moutier
Internet: www.tornos.ch
E-mail: contact@tornos.ch
Phone +41 (0)32 494 44 44
Fax +41 (0)32 494 49 07

Editing Manager:
Pierre-Yves Kohler
Communication Manager

Graphic & Desktop Publishing:
Georges Rapin
CH-2603 Péry
Phone +41 (0)32 485 14 27

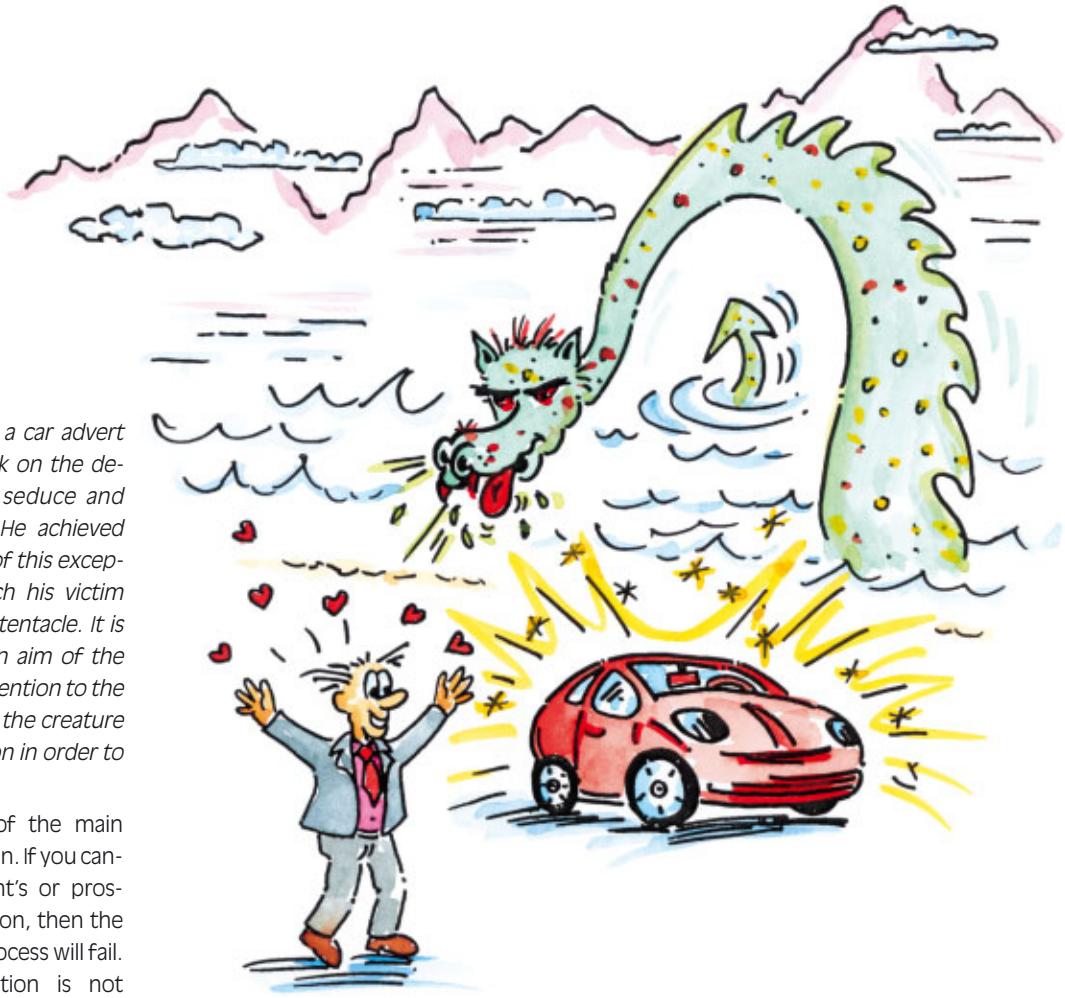
Printer:
Roos SA
CH-2746 Crémines
Phone +41 (0)32 499 99 65

DECO-MAG is available in five versions:

English / French / German / Italian / Swedish

Summary

Attracting attention!



The other day I saw a car advert where a monster took on the design of a vehicle to seduce and devour a passer-by. He achieved this using the charm of this exceptional car to approach his victim and catch him with a tentacle. It is obvious that the main aim of the advert was to draw attention to the design of the vehicle: the creature had to attract attention in order to survive.

This highlights one of the main rules of communication. If you cannot attract your client's or prospective client's attention, then the other stages of the process will fail. But attracting attention is not everything – this must be followed up by something concrete. The shape is important but must not take precedence over the key issue.

Dear reader, if you happen to be reading this, then from our point of view, this strategy has worked well and we have succeeded in attracting your attention. However, it is not our intention to spill the beans but rather to inform and surprise you and perhaps even divert you attention. Our team was eager to launch this first edition for 2006… It's unbelievable but the magazine has been going for 9 years now and just as on the first day, we are keen to supply you with articles that you find interesting.

With this issue, you will again see that we cover a large range of subjects, from the top-of-the-range horological brand to programming tips, via vital information relating to machining and tooling, to quote a few. You will find the content highly beneficial! It is truly our intention to provide added value by way of this magazine.

The magazine has been continually developed over the years, either to provide more clarity, impact or simply because the time has come to make changes. Above all, this is your magazine! I hope you will make many discoveries with this issue No. 36!

Is there an article that made you look twice? Would you like us to cover certain special topics? Do you have any comments, tips or advice you can pass on?

Please do not hesitate to contact us. We look forward to hearing from you soon.

Pierre-Yves Kohler
Chief editor
redaction@decomag.ch

Manufacture Roger Dubuis:

the perfect marriage between tradition and modernism

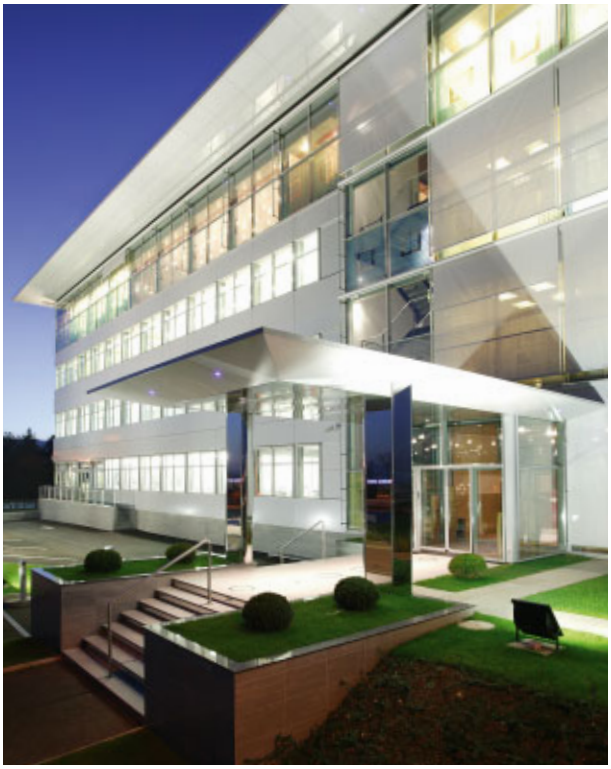
How the DECO can be incorporated in an exclusive horological production system!

Whilst en route to Meyrin where I was to meet Mr Carlos Dias, the founder, chairman and managing director of Manufacture Roger Dubuis, questions were turning in my head. How can a top luxury watchmaker reconcile industrial logic, rapid growth and the tradition of high quality?

How can the DECO machines of TORNOS be incorporated into this production environment, which I assume is very traditional?

I have now arrived and am standing in front of the brand new premises of the company. The building is imposing, made entirely from glass and high-quality materials and is perched on a small mound, as if to say "I've reached the summit"...

The tone is set right at the outset. The company exudes ultimate quality; its position as a creator of top-quality products is highlighted by the minute details. My welcome is warm yet discrete.



New Manufacture Roger Dubuis in Meyrin, symbol and rationality.

DECO Magazine (DM): Mr. Dias, Manufacture Roger Dubuis has been in existence for around 10 years and has numerous collections of watches and jewellery, whilst at the same time enjoying rapid growth. How do you appraise your position in relation to the older, more established brands?

Carlos Dias (CD): Yes, I established the company 10 years ago and I am always striving to ensure that the Roger Dubuis brand is never regarded as "old". I hope that in 10 or even 100 years time, the brand will still be regarded as young and dynamic. The fundamental difference compared with the majority of other companies is that Manufacture Roger Dubuis is a "vertical" company. We are self-sufficient and manufacture watches containing our components. This is our pledge of independence and demonstrates our ability to react.

DM: Quite so, but how do you reconcile this form of industrialisation with the concept of luxury and exclusivity?

CD: I am an industrialist who must continually upgrade, so that I can lead and encourage growth of the Roger Dubuis brand. The myth surrounding horological companies of the past is not deployed at Manufacture Roger Dubuis. I work according to the old methods, adopting secular gestures of quality and know-how – but not in the same way as my predecessors. We are still able to produce our watches in limited series runs, have them adorned with the stamp of the city of Geneva and guarantee their ultimate quality. Exclusivity at Manufacture Roger Dubuis, is synonymous with our guarantee.

DM: You mentioned the stamp of the city of Geneva, what about Swiss-made?

CD: Unfortunately, Swiss-made has become clichéd over the years and the assignment regulations mean that Swiss-made products can be retailed despite the fact that a large volume is produced in Asia, for example. The very strict Genevan

label, on the other hand, guarantees that each part corresponds to very detailed specifications, especially with regard to the setting and casing, and was produced purely in the Canton of Geneva (NDLR, see box at the end of the article).

DM: So as far as you are concerned, this is a must... Against the background of this "label" concept, are you certified to ISO?

CD: The project is in the design stage. It will soon be launched but was not a priority up to now. Whatever the circumstances and since time immemorial, each part produced on our premises is subject to an individual inspection. Each operation is documented and each inspection is relayed to our computer system. Traceability is complete because one of our main priorities is to ensure perfect quality.

DM: To come back in more detail to the industrial aspect, how are you developing your company and what makes up your fleet of machines?

CD: First of all, I must tell you that our industrial system is unique in the luxury horology market. All our parts are entered in a database covering know-how and performance. When a decision is reached to produce new models, our engineers always base themselves on this system because it allows us to develop new models more quickly and efficiently. What is more, we also have the facility to work with existing elements to simplify industrial logistics.

With Carlos Dias, ingenious creator and demanding industrialist, Manufacture Roger Dubuis grew from 2 to 380 staff within 10 years.

Round RD08 calibre, mechanical rewind with dual inertia-block, 14_''' lines, 42 rubies, rhodium-plated, "Côtes de Genève" décor.
Specification: tourbillon wheel, minute repetition, winding the striking-work by the bezel, tourbillon carriage visible at 5.00 a.m.
The RD08 calibre is made up of 398 parts!

DM: And what is the position with your self-sufficiency in this respect?

CD: It is clear that producing our own movements for our watches spares us a lot of complications. If we have a vision of a new model we can operate directly at all levels, from the very design of the movement right through to production and assembly. This self-sufficiency is in fact, a major competitive advantage and has always been my priority.

DM: So you have the facility of being able to design new products quickly. To do this, do you base yourself on a customer requirement or more on a technological approach?

CD: Our aim has always been to offer top-of-the-range, high quality watches. Our position is well defined and we know the market. In this context, we apply a technological logic in that we produce the most beautiful watch possible... and we know that it will be a hit in the market.

Manufacture Roger Dubuis:

the perfect marriage between tradition and modernism

DM: Are your products influenced by fashion?

CD: Absolutely. We live according to trends and market innovations that fuel our interest. Up to now, the creations of Manufacture Roger Dubuis have always had a following to the point where many other products resemble the watches produced by us.

DM: You mean copies?

CD: There are two cases in point. The first relates to vile copies and in this case we have acted decisively and are instigating legal proceedings because we don't want to cheapen the brand. The second case is paying homage to our know-how and creativity – a sort of acknowledgement, which is highly flattering.

DM: Where do you get your ideas from, especially in industrial terms?

CD: We always have a lot of ideas at all levels. As regards industry, we analysed the best practices of top companies in various sectors, such as automotive and aerospace.

DM: Let's now look at your fleet of machines... We read in the press that you have many different types of machines and that you even develop some of your own means of production. Is this right?

CD: Absolutely. Today we have 380 employees, of which two thirds are involved in production. Of the 250 people in manufacturing, more than half work in the micro-mechanical divisions and the others work in the horological workshops. As our production is fully integrated, we have a large number of machines and specialists in Luxury Horology. Our logic is relentless - we seek out the best for our requirements and if this is not good enough, we develop new products.

DM: You have a precision and profile turning shop including nine DECO 7/10 and DECO 13 machines, which comply exactly with your requirements. But aren't these high-output machines somewhat incompatible with a top-of-the-range horological plant?

CD: The DECO machines have been running 24 hours a day for several years and yet our fleet of machines could even be larger! The quality and precision of parts produced coupled with the operating versatility of the DECO machines fully convinced us. We analysed a large number of solutions and adopted the best. The return on investment in these machines has been something we needed.

DM: You produce the best watches in the world and have the best machines. What do you do to ensure that you work with the best people?

CD: The men and women who work for Manufacture Roger Dubuis are our most precious asset! They represent far-reaching know-how and we do the maxi-

DECO and Carlos Dias, a success story that cannot be denied.

mum to ensure that their working conditions are as good as can be. We invest a lot in ergonomy and our company restaurant, for example, is the envy of many a restaurant owner… I believe that one merely has to provide facilities that are not given by others! Each person is treated as a true colleague, a partner with whom we shall shape the future.

DM: I recently read that you stated: "We do what others won't do, don't know or cannot do". Could you explain this?

CD: Because of our "verticalisation", we can react very quickly and decide to work on a new model without having to rely on any outside supplier. We are therefore not tributaries of an outside company which is unable or unwilling to invest a lot of time or effort in Roger Dubuis. We want to go to the forefront and we have the opportunity of doing this! He who doesn't lead drops back! This is a well-known saying that still applies today. We must always question what we are doing and work on behalf of our clients.

DM: Mr. Dias, your company seems to be flourishing, your products are quality and precision brands and the industrial integration seems to be a total success. You have a strong image... What is it that drives you forward today?

CD: I am a creator of timepieces and in this regard there is still a lot to be invented, believe you me. We could go much further with regard to co-operating with our suppliers, for example. There's a lot to be done at marketing level.

The Medusa Ring of Manufacture Roger Dubuis is made up of a dual spiral body which raises the ring plate for locating either a positioned or blanked heart piece. Depending on the version, the heart is covered with rubies or pink, satin quartz so as to attract the eye.

DM: Thank you Mr. Dias for having lifted the veil from this exclusive production. How do you envisage the development of your machine fleet?

CD: Our company has not finished expanding and the fleet of machines will follow this trend. It is quite possible that I may be considering the possibility of purchasing new DECO machines in the coming months. This all depends on the offer and the competition!

DM: To conclude, how would you describe your product today?

CD: It's a modern watch, with inspiration yet not subject to the past and which projects into a future that belongs to us all!

So, a perfect marriage between tradition and modernism? Even if perfection is unattainable in this world, after this visit I believe that I've come very close to it. I have discovered the tradition of top-class Swiss horology, which is neither outmoded nor ossified! A tradition boosted by the Carlos Dias method. It is a modern and industrial vision that allows the company to give a shine to Swiss quality throughout the world.

A fascinating day. Thank you Mr. Dias for giving us your time.

Manufacture Roger Dubuis:

the perfect marriage between tradition and modernism

Roger Dubuis today

- 380 employees.
- 7 exclusive boutiques throughout the world, (10 others anticipated).
- 10 years' existence.
- 15 calibres.
- 16 additional bottom plates.
- 10 collections.
- 32 complications.
- 9 DECO machines.

Strong points

- Company is 100 % self-sufficient.
- Vast know-how.
- Great freedom of action and desire to lead.
- Efficient fleet of machines.

www.rogerdubuis.com

Excalibur by Manufacture Roger Dubuis

Round case, 18-carat polished and satin-finished pink gold, diameter 45 mm, sapphire back, water-tight to 30 m. – Dial: Roman numerals in relief. Hands in 18-carat pink gold. Bracelet: real, hand-sewn crocodile with stretch clasp with RD in 18-carat pink gold. Movement: RD08 calibre, mechanical, automatic rewind with dual inertia-block, 14_''' lines, 42 rubies, rhodium plated. – Specification: tourbillon wheel, minute repetition, winding the striking-work by the bezel, tourbillon carriage visible at 5.00 a.m. – Functions: hour, minute, second by tourbillon index, minute repetition. Production: 28 copies.

Appraisal of the "stamp of Geneva" specifications, which watchmakers must comply with in order to qualify for certification:

The watches presented to the inspection office must originate from manufacturers established in Geneva. The assembly, setting and casing operations must also have been executed in the same canton.

The steel supplies must show polished angles, drawn sides, visible and smoothed faces; the screw heads must be polished or circular-grained (rim and angled slot).

Each movement must have a ruby with polished holes at the gear train and escapement.

The escapement wheel must be light and its thickness must not exceed 0.16 mm for large items and 0.13 mm for those less than 18 mm. The locks must be polished.

Etc.

The man who refused to give up

A young entrepreneur from Saxony relies on TORNOS long-stock turning machines

Andre Schliebe, the owner of W&S Feinmechanik GmbH, is a likeable young man whom you can more easily imagine at a university for the humanities than in a turning shop. But impressions can be deceptive. At the tender age of 22, when most other young Germans are just starting their studies, he became independent with his own turning shop and has been enjoying continuous growth ever since. From the outset he opted for a partnership with TORNOS, and has never regretted this decision.

Frank Mortag of TORNOS Germany (left) and Andre Schliebe (right), owner of W&S.

Altgeringswalde in Saxony isn't exactly one of Germany's industrial centres. The atmosphere of the place, situated in the triangle between Dresden, Leipzig and Chemnitz, is more one of rural idyll and after the reunification of Germany, many young people migrated from here to larger cities to seek their future careers. Andre Schliebe chose to stay. Thirty years ago his grandfather Helmut Winkler ran a machine shop in Geringswalde, and it was here that Andre Schliebe started from the bottom, learning about metalworking and turning in particular. The company's main output took the form of turned parts for gas fire manufacturers in what was at that time still East Germany, using hand lever turning machines and cam-controlled automatic lathes.

After the reunification, the metal industry in the East teetered closer and closer to the brink and few saw any real chances of survival. But for Grandpa Winkler and his canny young grandson Andre Schliebe, giving up wasn't an option. New technologies, particularly CNC machines from TORNOS, were the stimulus to take a new risk. The decision now facing Andre Schliebe was whether to give up and migrate as many of his friends had done, or take a risk and start afresh. He chose the latter, and set up his own company. He started in

September 1998 with a new company name, five employees, his grandfather's cam-controlled turning machines and two new TORNOS CNC sliding headstock automatic lathes. Andre Schliebe now employs over 30 people, his collection of machinery has now grown to 16 TORNOS CNC machines and includes a large turret lathe shop with more than 30 machines; new facilities are being built and the company is expanding rapidly.

Success in Germany

At a time when everyone is discontented and so many companies are relocating production abroad, it's astonishing that such a young entrepreneur from the former East Germany should be going from strength to strength in the way he is. Andre Schliebe smiles modestly: "We're a young, motivated team, we understand our trade and with the TORNOS CNC sliding headstock lathes we've got a set of machines that allow us to achieve great things. The company has a positive reputation amongst our customers that we don't shy away from anything."

No matter what part a customer needs, Andre Schliebe and his team will find a solution. This sometimes means placing very high demands on the TORNOS machines and devising new options and equipment. "Now and then it's necessary to modify the standard options slightly to fulfil our requirements, but the technologies at Moutier and Pforzheim are just as flexible as we are and together, we usually find a solution," says Andre Schliebe, commending his suppliers. With tricks like this up his sleeve he is able to perform precision machining on parts of up to 800 mm in length, gear-cutting on his long-stock automatic turning machines and many other similar procedures. His young team is still as keen as ever to be better than the rest. Even in their free time, the team are still playing around with programs and settings. This is where the advantages of the parallel numerical control system PNC-DECO and programming software TB-DECO come into their own.

The patented TB-DECO programming system runs on Windows providing a user-friendliness interface for the customer. TORNOS designed the software solely for production on automatic turning machines, enabling logical programming and simulation of all motion sequences. Once the parts program has been created, it simply needs to be transferred to the PNC control system. Here, the operations entered are executed automatically. Programming can be carried out either in the workshop or at home. The team at W&S uses this opportunity to allow for optimum running-in of components.

This is why Andre Schliebe swears by the consistent performance of his machinery. He manufacturers almost exclusively on TORNOS machines, generating incalculable synergy effects that allow him to produce at competitive costs.

W&S always finds a solution to satisfy customer requirements.

The man who refused to give up

All the staff can operate all of the machinery and tools and fittings can all be used in exactly the same way. "The experience my team has gained and their knowledge of these machines has simply made them faster and better. This allows us to operate more machines with fewer people than others can," says Andre Schliebe. Nevertheless, he is continually taking on new staff and places a great deal of emphasis on training up apprentices. He is conscious of his responsibility to the region and gives young people a chance to get specialist training.

Success: the best proof

The company is currently working at full capacity, with three shifts working around the clock. The firm's customers include virtually all of the major car manufacturers, electronics and high-frequency technology companies and manufacturers of medical equipment. The company machines brass, steel and stainless steel and the machines consume an annual amount of 500 tons of steel.

Batch sizes range from 1000 to infinity. Despite this, Andre Schliebe has not yet been able to bring himself to buy any multi-spindle turning machines. "With my CNC TORNOS machines I'm much more flexible and I'm not in a position where I have to operate an expensive machine at full capacity at any price. And the productivity of the TORNOS machines is already in the very top segment." The automatic cam turning units are joined on the workshop floor by the whole DECO range. In terms of kinematics the DECO range is equal to the cam-controlled machines in every way. It's possible to turn using two separate tools simultaneously and to separately interpolate rough and finish turning.

Tranverse operations on the guide bush are made possible with four power tools and even multi-contour turning of surfaces and

The latest CNC techniques together with 30 employees ensure the success of W&S.

The company fully utilises its capacities and works 3 shifts.

contours on the guide bush is no problem. An independent counter-spindle with three numerical axes centres the working position as determined by the program. Seven different positions are available, all of which can be optimised 100 % during primary processing time. The main and counter-spindles can each be adjusted, facilitating milling operations and other machining operations. Threads can be cut and drilled without limitation on the basis of the differential principle. It is even possible to turn and perform axial drilling simultaneously, with optimal management of feed rates and rotation speeds. "All of these features make the DECO range an optimum tool for boosting productivity," says Andre Schliebe.

Reliable partnership

Although TORNOS has had to weather a few storms over the last few years, Andre Schliebe has never once regretted his decision in favour of this business partner. "Frank Mortag, the regional sales manager, and the whole team at Pforzheim have never let me down and even during difficult times, I always had a good feeling," stresses the owner of W&S. It's also to his benefit that TORNOS service is now also operating out of Chemnitz, giving it what you could almost call a home advantage. A service technician can be on the scene within just a few hours, allowing production to continue. Preventive maintenance and smaller repair tasks are usually carried out at the weekend so as not to interrupt production. As far as Andre Schliebe is concerned, his partnership with TORNOS brings nothing but benefits and he is optimistic that, over the next few years, he will be able to stick to his goal of growing by two machines every year.

W&S Feinmechanik &
Mechanische Fertigungs GmbH

Dresdener Strasse 173
09326 Altgeringswalde
Tel.: 037382/7 13 80
Fax: 037382/7 13 81
wus-feinmechanik@t-online.de
www.wus-feinmechanik.de

TORNOS Technologies
Deutschland GmbH

Karlsruher Strasse 38
75179 Pforzheim
Tel.: 07231/91 07 - 0
Fax: 07231/91 07 - 50
contact@tornos.de
www.tornos.ch

Centralised lubricating device for the DECO [a-line]

This Centralised lubricating device does not have an option number. If you are interested please contact your TORNOS dealer.

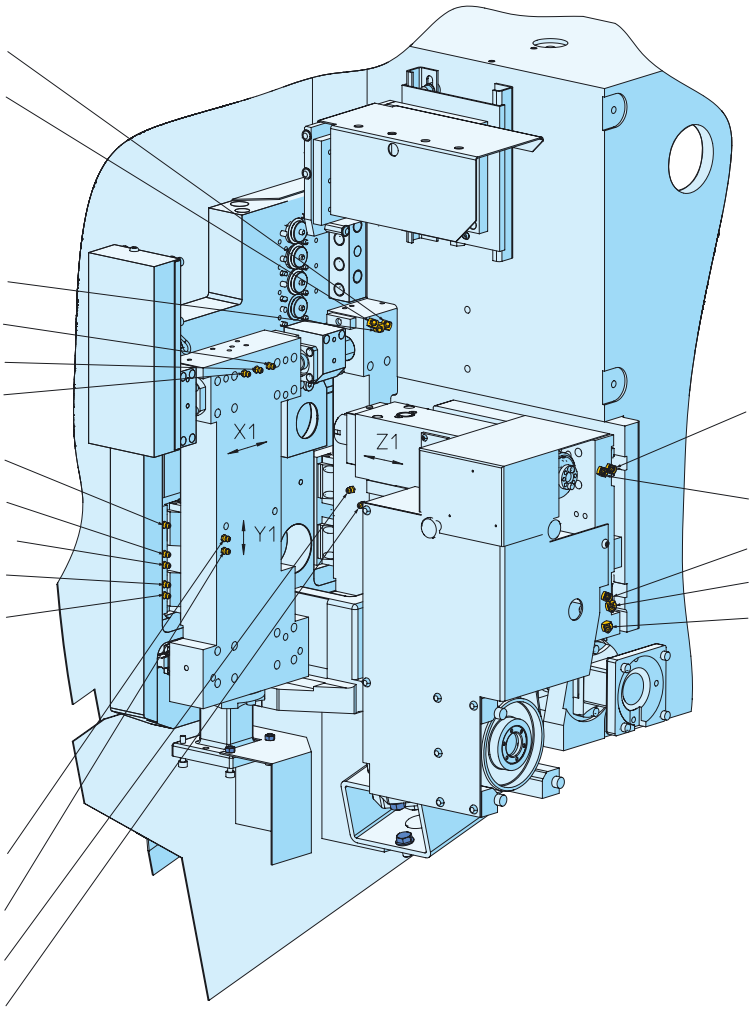
Application

Lubricating the axes and ball bearings can often be a tedious task, which means it can quite frequently be forgotten or even completely neglected. On a DECO machine with 10 axes, the number of lubrication points can be anything up to 50!

An automated, central lubrication system dispenses with human intervention at this level making it a highly valuable piece of auxiliary equipment.

Advantages

- Dispenses with periodic lubrication.
- Provides the assurance that the parts are always lubricated.
- Reinforces the reliability of machine parts.
- Low oil consumption.



Remark

In order to ensure fail-safe lubrication the tank is fitted with a detector, which triggers an alarm when the lubricant level is low.

Technical characteristics

Consumption:

- 10 cm^3/hour for the DECO 7a/10a.
- 20 cm^3/hour for the DECO 13a/20a/26a.

Lubrication intervals:

- Every 10 minutes during the cycle.

Type of oil:

- Motorex Corex HLP 320 or equivalent.

Compatibility

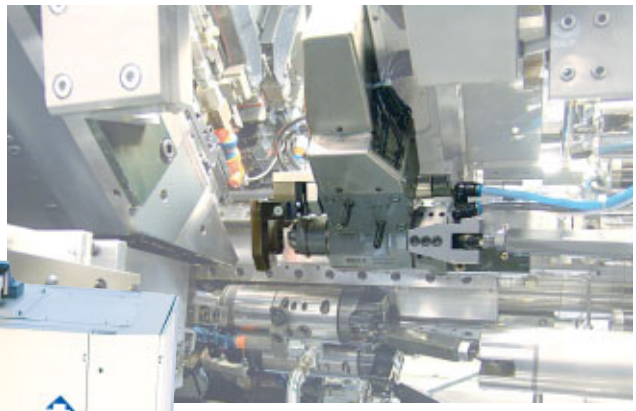
All DECO machines of the [a-line] series.

Availability

Immediately available ex-works.

Manipulator arm and single palletization system

As a complement to the palletization systems offered for the MULTIDECO 32/6c and 20/8d, TORNOS is now offering a system for the other machines in the MULTIDECO range.



Option

This system does not yet have an option number. If you are interested, please contact your TORNOS dealer.

Application

In some instances, the requirements governing the parts or production processes do not permit the parts to be removed from the machine by a chute and can often require a handling solution. Whether this is for purposes of integration into a production system or simply to guarantee the surface quality of the parts, the MULTIDECO is kitted out!

The new manipulator arm, combined with a palletization system incorporated in the machine, makes it possible to control part evacuation from the machining area to outside the machine.

The manipulator system is modular, meaning that the palletization capacity can be extended at will. For example, a palletized part washing station can be added. This versatility in no way jeopardises the performance of the system but allows it to be adapted to the specific requirements of each application.

Advantages

- Part evacuation control.
- All parts individually handled.
- No reworking of the parts.
- Modular system can be adapted on request.
- Simplicity that guarantees performance.

Technical characteristics

- Nominal capacity: 3 pallets.
- Pallet dimensions:
  Width 400 mm, length 325 mm (max. 600 mm).
- Control via the machine NC.

Compatibility

MULTIDECO 20/6b, 20/6be, 32/6i, 20/8b.

Availability

Available ex-works.

Remark

You can download a video sequence demonstrating the system from the following address: www.tornos.com, (download section).

Warning! This sequence takes up 5 MB! Downloading can take quite some time if you do not have a high-speed connection.

Meeting clients…

Are trade fairs a must ?

At the time of writing these lines we still have no idea of the outcome of the EMO regulation, which is putting a brake on trade fairs in Europe (CECIMO countries) during the EMO years. What is certain is that a non-EMO year, like the present one, will generate massive logistical problems. As a manufacturer, TORNOS wants to meet the maximum number of clients possible by using exhibitions. It enables everyone involved in manufacturing to discover the vast number of suppliers, innovations and much more. This year too, TORNOS will be attending more than 40 events throughout the world.

The trade fairs prove to be a real challenge when it comes to moving very large machines. To find out a little more on this subject, the editorial team met Mr. Pierre Yves Kohler (PYK), head of Marketing and Communications.

DECO Magazine (DM) : Mr. Kohler, you exhibit machines weighing several tonnes throughout the world. Isn't that a bit "mad" ? Could you not use another means of attracting customer attention ?

PYK: Besides talking of several tonnes here, we are also talking of several hundred thousand francs. But in all events, exhibiting machines purely as a means to attract attention is not a rational approach. A machine on a stand must really send out a message and allow our clients to find out more about it and see more.

DM : So, in other words, you are not exhibiting machines without a specific objective ?

PYK: Absolutely ! We want to add value to our exhibits. With regard to new products, it is very important to show them to our clients, so that they can "touch" and understand these by way of a process that allows them to ask questions and to see things happen with their own eyes. For example, to explain the simplicity of changing a setting programme, there is nothing better than doing it in a few minutes in the presence of the client. With respect to those products which are not new, we want to demonstrate the machine's performance, such as special machining processes or facilities that meet very specific requirements.

DM : Is the number of exhibitions with machines in decline ?

PYK: The subject of "exhibiting machines" is one we keep coming back to. It is obvious that moving a machine without a specific purpose is not a rational solution. For us, it is

essential that our clients are given the maximum of information possible in a friendly environment. But in this context, is it really necessary to keep moving machines ?

DM : Is that a question ? For someone who moves hundreds of machines around the world each year, you surprise me ...

PYK : Yes, it's a question we are asking ourselves precisely this, because we are executing all these handling operations. For a year like the current one, the total forwarding costs amount to several hundred thousand francs. Couldn't this money be put to better use ? We can create more welcoming environments, rethink our exhibitions and use virtual machines, for example.

DM : That's quite revolutionary. Aren't you worried about being too innovative and hence "losing" your clients on the way ?

PYK : Wait a minute.. I didn't say that we were going to dispense with the machines at the exhibitions ! It is true that we are considering many questions but we will not adopt measures that may penalise our clients or ourselves. If the majority of clients told us that it is not essential to have a machine, as such, on the stand and that other aspects are more important.

DM : That's interesting ! The idea will now be launched... Does this idea appeal to you, our readers ? What do you think of a stand run by TORNOS, a machine tool manufacturer, that does not feature any machines ? Would you be tempted to visit it ? What are the vital elements to get your interest and bring you to our stands ? We are interested in your opinion ! Please send your replies to redaction@decomag.ch. We shall produce an article based on your comments and ideas a little later in the year[1].

And for 2006, are there any innovations with regard to trade fairs ?

PYK : In geographical terms, we shall have an even greater presence in Asia compared with previous years. In the USA we shall organise events at our agents facilities, as well as participate in the usual exhibitions[2] and in Europe we'll be exhibiting more or less everywhere. Generally speaking we shall optimise the budgets. For example, we no longer wish to exhibit two almost identical machines on one stand. Following the same ideas, some machines will be exhibited without a bar feeder. These are marginal changes and not a radically new concept !

DM : To conclude, you are not announcing any revolutionary changes as indicated above for the year 2006 ?

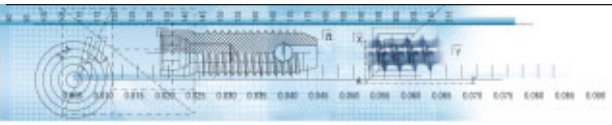
PYK : Not a revolution as such, we really want to present the maximum to our clients. We are meeting them with a view to helping them discover how our solutions can match their requirements anywhere in the world !

The following published data is available at the time of going to print. There may be changes. If you are interested and would like to visit a TORNOS stand, please consult the company's website or your normal contact to obtain the latest information.

[1] *Please don't hesitate to send me an e-mail. I would be pleased to read your comments.*

[2] *For the latest information on this subject, please consult the company's website : www.tornos.ch*

Meeting clients…



Europe

Exhibitions	Country	City	Date of opening	Date of closing	Week
10ème Mondial des métiers Eurexpo	France	Lyon	9.2.2006	12.2.2006	6
Samumetal	Italy	Pordenone	9.2.2006	13.2.2006	6-7
Simodec	France	La Roche Sur Foron	7.3.2006	11.3.2006	10
Techni-Show	Holland	Utrecht	14.3.2006	18.3.2006	11
Exhibition Teximp	Slovenia	Ljubljana	16.3.2006	17.3.2006	11
Metav Süd	Germany	München	4.4.2006	7.4.2006	14
Siams	Switzerland	Moutier	9.5.2006	13.5.2006	19
Mach	England	Birmingham	15.5.2006	19.5.2006	20
Metav Nord	Germany	Düsseldorf	20.6.2006	24.6.2006	25
Gewatec	Germany	Wehingen	6.7.2006	8.7.2006	27
AMB	Germany	Stuttgart	19.9.2006	23.9.2006	38
Brno MSV	Czech Republic	Brno	2.10.2006	6.10.2006	40
Tekniska Mässan	Sweden	Stockolm	3.10.2006	6.10.2006	40
Bimu	Italy	Milan	5.10.2006	10.10.2006	40-41
Prodex	Switzerland	Bâle	14.11.2006	19.11.2006	46
Turntec	Germany	Frankfurt	29.11.2006	2.12.2006	48

Asia

Exhibitions	Country	City	Date of opening	Date of closing	Week
MTA	Malaysia	Kuala Lumpur	3.5.2006	7.5.2006	18
Taipei Int'l Manufacturing Technology Show	Taiwan	Taipei	3.5.2006	7.5.2006	18
Die & Mold	China	Shanghai	8.5.2006	12.5.2006	19
Medtec	China	Shanghai	21.5.2006	23.5.2006	20-21
13th South China IMME	China	Guangzhou	23.5.2006	26.5.2006	21
Metal working	China	Shanghai	10.10.2006	13.10.2006	41
Jimtof	Japan	Tokyo	1.11.2006	8.11.2006	44-45
China DMP	China	Dongguan	8.11.2006	11.11.2006	45
ThaiMetalex	Thailand	Bangkok	23.11.2006	26.11.2006	47

USA

Exhibitions	Country	City	Date of opening	Date of closing	Week
MDM West	California	Anaheim	31.1.2006	2.2.2006	5
Medical Device Expo	Puerto Rico	Suan Juan	16.2.2006	17.2.2006	7
Westec	California	Los Angeles	27.3.2006	30.3.2006	13
Eastec	Massachusetts	Springfield	23.5.2006	25.5.2006	21
Omtec Orthopeadic show Rosemont	Illinois	Rosemont	21.6.2006	22.6.2006	25
MDM East New York	New York	New York	6.7.2006	8.7.2006	27
IMTS	Illinois	Chicago	6.9.2006	13.9.2006	36-37
MDM Minneapolis	Minnesota	Minneapolis	25.10.2006	26.10.2006	43
Greater NY Dental Meeting	New York	New York	26.11.2006	29.11.2006	47-48

Rest of world

Exhibitions	Country	City	Date of opening	Date of closing	Week
24th Ciosp	Brazil	São Paulo	28.1.2006	1.2.2006	4-5
Metalobrabodka	Russia	Moscow	23.5.2006	27.5.2006	21
Austech	Australia	Sydney	30.5.2006	2.6.2006	22
Fimaqh	Argentina	Buenos Aires	30.5.2006	3.6.2006	22

Fast programming of ISO code

To facilitate the input process for entering ISO code in DECO and MULTIDECO machines, new functions have been added as an ongoing process in the 2004 and 2005 versions and now the 2006 version of TB-DECO. These improvements are the result of the strategy being pursued by TORNOS, one that involves delivering uncompromising standards of feasibility as well as faster and simpler programming operations.

Programming of X, Y, Z and C axes

The label on each axis, which identifies the tool system on which it is located, is attached automatically.

Example

Write: "X"

To attach: "X1= " *when programming comb 1 (or slideway 1)*

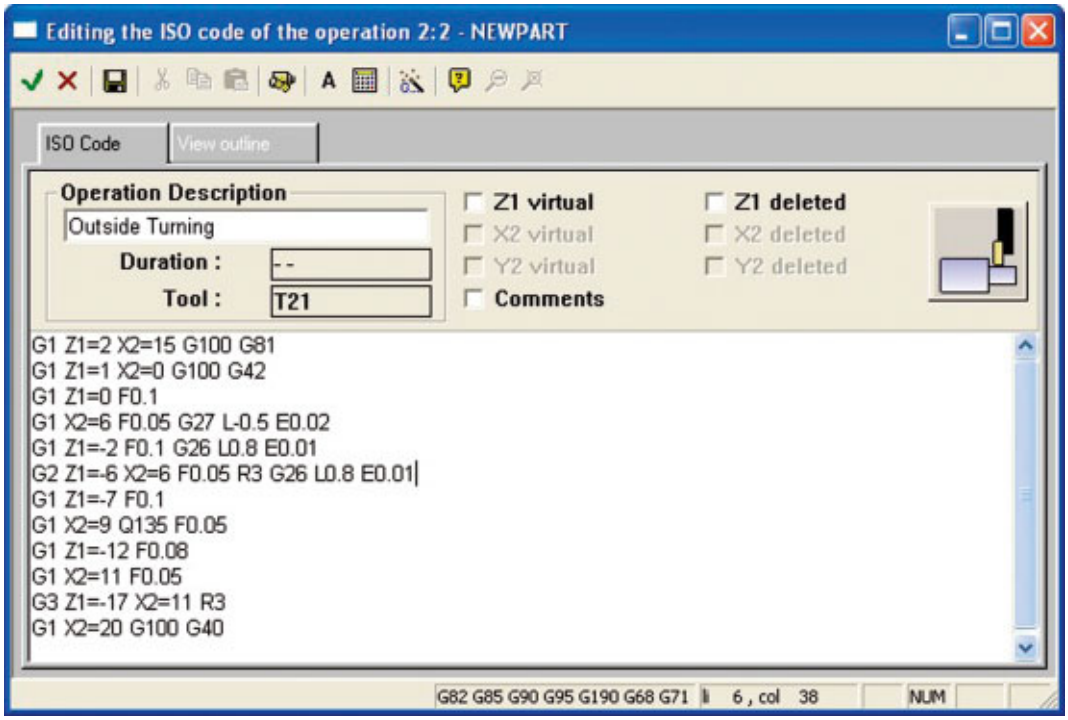
It is no longer necessary to enter a space before programming an axis. Instead, the TB-DECO software automatically adds a space if there is not already one there.

Example

Write: "G1X6Z4.2"

To attach: "G1 X2=6 Z1=4.2" *when programming comb 2 (DECO)*

"G1 X2=6 Z12=4.2" *when programming slideway 2 (MULTIDECO)*



Programming G codes

Code G1 is the most frequently used code for programming purposes and it is possible to enter this G1 code followed by a space simply by keying in a single space at the start of the line.

Example

Write: " "
To attach: "G1 "

Codes G1, G2, G3, G1 G100, G2 G100 and G3 G100 have become modal. It is no longer necessary to reprogram these at the start of each line provided that the type of trajectory has not changed during the operation. The TB-DECO software automatically inserts the last G code programmed to define a trajectory provided that character X, Y, Z or C is written at the start of each line.

Examples

Write:	"X"	*when the last trajectory programmed is G2*
To attach:	"G2 X1="	*when programming comb 1 (or slideway 1)*
Write:	"Z"	*when the last trajectory programmed is G1 G100*
To attach:	"G1 G100 Z1="	*when programming on the main spindle (DECO)*
	"G1 G100 Z11="	*when programming slideway 1 (MULTIDECO)*

Since G codes are used more frequently than M codes, it is possible to insert a G code at the start of a line or after a space without having to key in the character G.

Examples

Write: "2"
To attach: "G2"

Write: "90 94"
To attach: "G90 G94"

In the same way as when programming axes, it is no longer necessary to enter a space before programming a G code, provided that the previous function is not being used. Instead, the TB-DECO software automatically adds a space if there is not already one there. The same applies to the use of M codes.

Example

Write: "G90G94"
To attach: "G90 G94"

Fast programming of ISO code

Setting the speed of a spindle

After programming an Mx03 or Mx04 code to activate spindle Sx in either clockwise or anti-clockwise direction, the character S appears on screen automatically.

Example

Write: "M103 4000"

To attach: "M103 S4000"

The character S also appears on screen automatically after programming of new G96 functions (constant cutting speed) and G92 functions (limitation of cutting speed in mode G96).

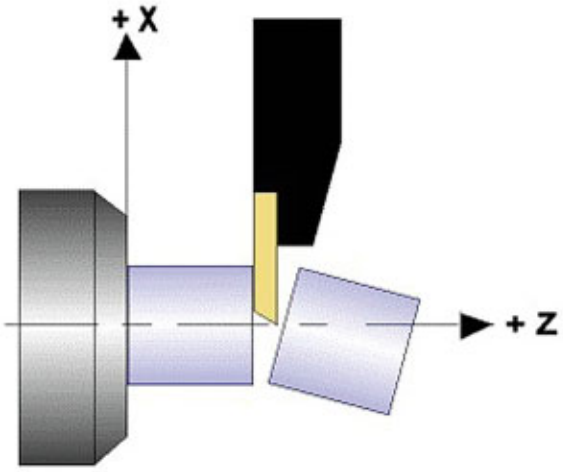
Examples

Write: "G92 4000"

To attach: "G92 S4000"

Write: "G96 150"

To attach: "G96 S150"



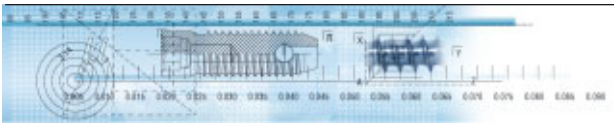
Programming [s-line] DECO units

The start of 2006 coincides with a number of new programming innovations for DECO units. With delivery of the first DECO 8sp and 20s, TORNOS is reintroducing standard CNC programming. This choice is linked to new kinematic features involving fewer tool systems than the DECO in the or the MULTIDECO units.

However, many customers wish to be in a position to program their new DECO 8sp and 20s units with their TB-DECO software. This is why 2006 will be the year which sees a narrowing of the gap between TB-DECO software and standard CNC programming. The objective this year is to offer our customers a way of programming their machines with the help of TB-DECO. For these machines, TB-DECO software will no longer generate tables. Instead, it will generate ISO code which can be read and modified directly on each machine.

As part of this project, new functions are going to appear in the current TB-DECO 2006 and in the future TB-DECO 2007. These functions will be presented to you in future "tricks and tips" articles.

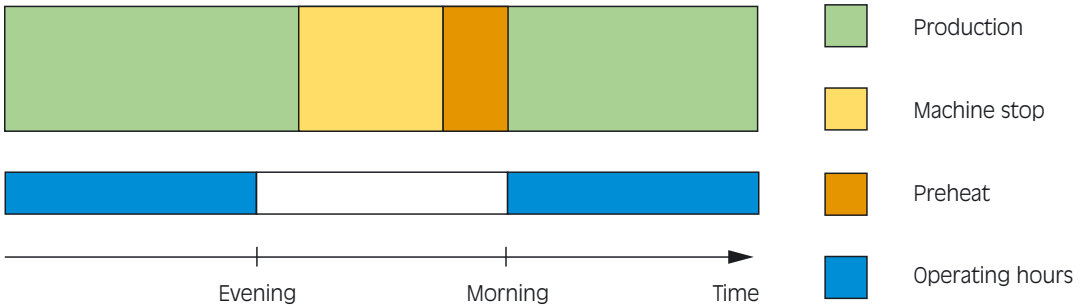
Option of preheating the machine



A new CNC function will be appearing on the market in April 2006 that will automatically activate a machine preheating mode at a predefined time.

This new option will make it possible to preheat all DECO units and the DECO 13b before operators arrive to start work and following planned machine shut-downs (overnight, weekends and during vacations).

This automatic machine preheating mode will help to achieve substantial reductions in the time required to start producing high-precision components. This kind of component requires the machine to be operating at a stable temperature.



Operation

The operator is able to program a number of components for the machine to produce overnight or at weekends. Once the machine has completed its production batch, it switches into standby mode. At a programmed time, or at a programmed date and time, the machine then automatically activates its preheating mode.

At the start of this preheating phase, the machine retracts the bar right into the tube to prevent collisions with tools. The DECO unit then runs its last component program but cancels the movement of axis Z1 to prevent any machining from taking place. To avoid any problems of overheating, the spindle override function can be reduced right down to 25 %.

In the morning, when the operator wishes to recommence production, he first needs to manually cancel the preheating mode. Furthermore, he will not be able to start producing parts until he has manually moved the bar until it is in contact with the cutting tool. This is a safety measure intended to prevent any risk of tool breakage when the first component is loaded on to the machine.

Comment: *no change to the component program is required on the TB-DECO software in order to use the preheat function.*

Availability

This option will be available on all DECO units.

Thereafter, this option will also be made available on DECO units.

►►►

PUB Quinx
Verticale

Option of preheating the machine

Necessary upgrades

Activating this preheating option requires your CNC software to be upgraded and requires a new version of TB-DECO 2006 software to be used, which will be available from April 2006. However, TORNOS recommends that you use TB-DECO ADV 2006 software instead of the basic version of TB-DECO 2006.

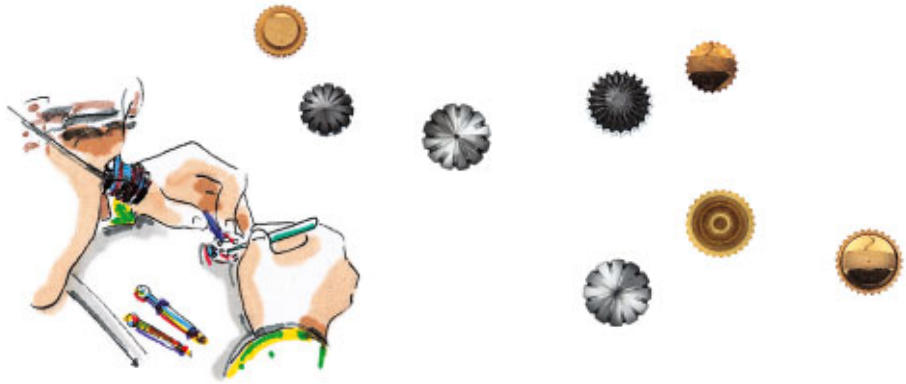
Comment: *TB-DECO 2006 and TB-DECO ADV 2006 software need to run on a Windows 2000 or Windows XP operating system.*
Versions 95, 98 or NT are no longer supported.

Limitation

This option is subject to one restriction. It cannot be used if the component program includes a deep-boring function which involves the tool tip (drill bit) entering the tube during the machining process. When this happens, the drill bit would make contact with the bar even though no pre-centring has taken place. This situation would cause the drilling tool to break.

A multi-spindle turning machine for the watch making sector

How MULTIDECO respond to the needs of this very exacting market segment!



Tremendous performance for tiny components

A significant development in the use of primary materials for the manufacture of watches is now in progress. On a progressive basis, brass is being replaced with stainless steel. Although this metal delivers many benefits, it is nonetheless more difficult to machine. A fact which has an adverse impact on productivity.

What should be done? Engineers at TORNOS have now found a solution.

A sector characterised by quality and precision

Working as it does in the precision world of small, exceedingly high-quality components the watch making industry is renowned for its exacting standards. It is not surprising to find that in regions typically associated with watch making such as the one located within the crescent-shaped curve of the Jura mountains in western Switzerland, you not only find sub-contractors with this high level of expertise in precision manufacture at their fingertips, but also machine manufacturers who know how to translate the needs of this sector into the design of their machine tools.

TORNOS has very many years of expertise and experience in the watch making industry, which is combined with its automatic single-spindle and multi-spindle turning machines. In its quest for the exceptionally small, TORNOS has invested in the kind of production and measuring facilities that enable it to demonstrate the feasibility of components on this minute scale. It is a natural extension of this development for this manufacturer of machine tools to get firmly to grips with the problems associated with stainless steel components. Through its tests on single-spindle turning machines, the company studied the manufacture of tiny stainless steel components for the watch making industry in very great detail. The results were then transferred to its multi-spindle turning machine. Particular interest was paid to the production of components with a ratio of diameter to length of 1:3 or 1:5, examples being crown wheels, tubes and other extremely small components.

Why opt for a multi-spindle turning machine?

The MULTIDECO 20/8b is an eight-spindle turning machine capable of working with bar stock up to a diameter of twenty millimetres. This turning machine meets the high

A multi-spindle turning machine for the watch making sector

standards of precision required by the watch making industry. One of the difficulties faced in volume production work is to be found in the ability to deliver consistent quality throughout an extended period of production. For example, any variation in machine temperature necessarily gives rise to variations in the precision of any component being machined. These variances can often exceed one hundredth of a millimetre.

To combat this, the designers of the MULTIDECO removed the cutting oil tank from the main machine structure, which contains one thousand or more litres of oil depending on the model. This oil tank is then maintained at a continuously controlled and stable temperature. The 300 litres/ minute of oil flowing through the machining area at any given time are able to be maintained at a controlled temperature of ± 0.2 degrees centigrade thanks to this temperature stabilisation of the oil. Since this same oil travels through the bearings as well as through the spindles, it ensures that the entire machine is maintained at a stable temperature level.

A controlled machining area

To further improve the quality of temperature control in the machine, and to prevent any build-up of heat in the machining area itself, oil vapours are evacuated through a filtered outlet. By eliminating hot zones, the machine is able to achieve higher standards of precision while at the same time protecting its environment.

The flow of temperature-controlled oil also delivers other benefits. For example, without this system the temperature of a spindle could easily rise to 60°C. In so doing it would become prone to the influence of any changes in ambient air during bar changes. All you would need to do is to open a door to the machining area for inspection purposes or to remove swarf and the temperature of the spindle could drop with adverse implications for machining precision.

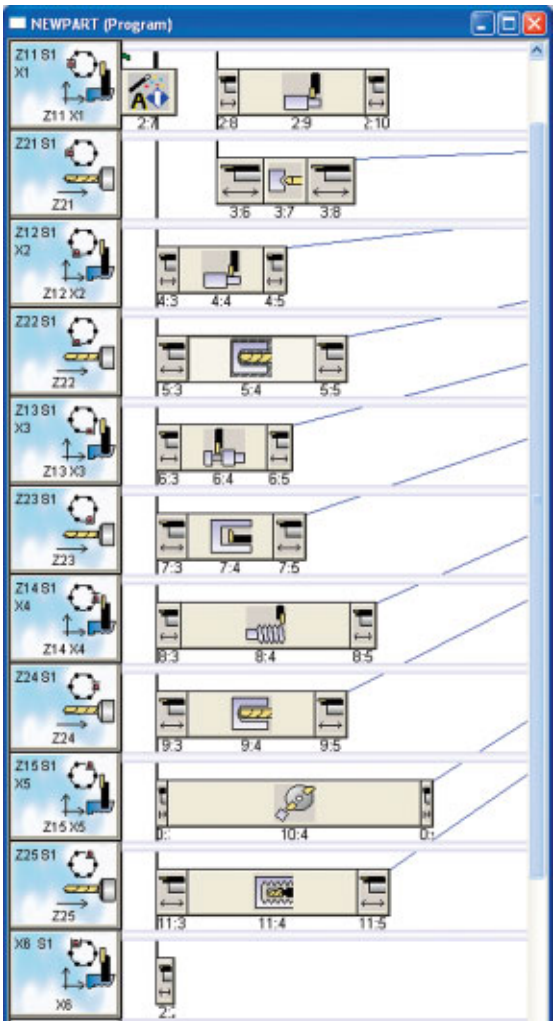
However, because the spindles are cooled the temperature of these units is controlled continuously thereby avoiding variations in temperature. This ensures that the machine remains temperature-controlled at all times enhancing its capability for precision work. Machine operators on the search for that last elusive micron of accuracy will certainly appreciate this fact.

A real facility with the smallest of components

Although your thoughts may be of twenty millimetre bar stock when the MULTIDECO 20/8b is first mentioned, you should remember that this multi-spindle turning machine is able to work with bar stock diameters as low as four millimetres without requiring any specific developments on the machine. This dimension matches the bar stock diameters required by the watch making industry for a particular range of components, which now includes parts manufactured from stainless steel.

Even the feed unit is equipped to enable automatic loading of this kind of slim-line bar stock. The entire original concept of this machine can therefore be retained without requiring any modification whatsoever. The need to work with tooling designed to suit the needs of the watch making sector did not pose any particular problems to the engineers at TORNOS – after all, they can call upon their many years of experience in this sector.

Having created a way of producing small components on a standard multi-spindle turning machine, this expertise can easily be transposed to other sectors. Examples of this would be sectors such as electrical engineering, electronics, pneumatics, medical or others.



Identical feel, enhanced productivity, equivalent quality

The multi-spindle turning machine employs very similar technology to its single-spindle counterpart and also operates with the help of the TB-DECO software. As a consequence, the programming operation is identical in both cases. This means that any operator familiar with the use of TORNOS single-spindle turning machines will rapidly be able to acquire the expertise required to work on the MULTIDECO. In a similar manner, this also means that all the knowledge TORNOS has built up in the watch making sector with its single-spindle units can also be transferred reasonably simply to the specialists working on these multi-spindle machines. Experience has also demonstrated that programming is actually simpler on multi-spindle unit because the machining operations are distributed across several locations – eight in this particular case.

The watch making industry is renowned for its exacting quality requirements. While dimensional tolerances, even for casing components have to be achieved, just as they have anywhere else the primary emphasis needs to be placed on external appearance - on surface finish. This needs to be nothing less than perfect, something that is easy to achieve on a MULTIDECO turning machine. Depending on user requirements, components can be finished without requiring any recourse to additional operations on other items of equipment.

Installation space and production output

Self-evidently, an automatic turning machine like the MULTIDECO 20/8b will require two to three times the installation space of a single-spindle turning machine. Broadly speaking, this requirement is compensated for by the gain in productivity which can, for a given component, improve from 105 seconds to a mere 18 seconds, i.e. a substantially greater improvement in production output. You should also bear in mind that, in a multi-spindle unit like the MULTIDECO 20/8b; eight components can be in production concurrently at any given time.

For any component manufacturer seeking continuous improvements in productivity through the use of an ultra-high performance piece of equipment, the choice of an automatic multi-spindle turning machine has to be a compelling one, especially in terms of its ability to more than pay for itself.

A marriage of expertise and experience

Specialists whose experience was obtained on the single-spindle units employed in the watch making industry found it very easy to transfer their expertise to multi-spindle units. The simple fact that these turning specialists conducted their programming work with TB DECO software automatically meant that they were already moving in a familiar universe. This made their programming task much easier.

The attractions of MULTIDECO units also lie in their modern concept combined with digital control. If any correction to precision is required during a volume production run, operators can enter a correction of just one micron and the machine will then respond by exactly one micron. This fact has been verified by many successive series of tests. This incidentally demonstrates that operators, by virtue of their existing expertise and experience, are able to remain in full control of their machines at all times. A multi-spindle turning machine is therefore an exceedingly satisfying tool to work with because it is able to operate with exactly the same tools as employed on its single-spindle counterparts.

A clean environment

The MULTIDECO 20/8b meets the clean environment needs of any modern watch making facility where cleanliness and protection from noise and vapour emissions have become important issues. It would not be far from the truth to view a modern watch making facility like a laboratory environment. The MULTIDECO, despite being an automatic multi-spindle turning machine complies perfectly with these criteria. Here once again, TORNOS has managed to deliver what is needed using a standard machine with standard equipment. For example, the first inspection tests into machine noise emission levels have demonstrated that these units satisfy customer criteria.

Conclusions

TORNOS has very many years of expertise and experience gained by working hand in hand with its customers. This same expertise can also be transferred to other sectors, e.g. medical, electronics, hydraulics and others. Users of multi-spindle turning machines have until now been used to manufacturing components at a consistent size: now TORNOS has shown that it can also produce very small parts down to a diameter of three millimetres, even on fairly large machines.

With its digital control system the MULTIDECO is an exceptionally flexible machine, both in terms of the components it can produce, the materials it can work with and the length of production runs. Single-spindle technology was transferred to its multi-spindle counterpart. This transfer enabled the flexibility of a single-spindle turning machine to be combined with the productivity of a multi-spindle unit. The fact that both types of machine operate using the same software and the same programming philosophy ensures that either is easy to integrate into any existing range of production machines.

While there may be benefits in using a multi-spindle unit for certain needs, there is still a robust market requirement for single-spindle units. Customer needs must always be the guiding factor when considering how best to answer the question of which solution is most suitable for a given application.

TORNOS SA
Rue Industrielle 111
2740 Moutier
Tel. 032 494 44 34
Fax 032 494 49 03
www.tornos.ch

Perfect harmony:

ORTHO cutting oils with plastics and elastomers

Many different types of plastics and elastomers (e.g. seals) are used in modern machine tools. MOTOREX had the compatibility of their ORTHO cutting oils tested and together with TORNOS, defined the requirements in respect of all machine tool plastics used.

Although the cutting oil is only actually needed at the point of action where tool and work-piece meet, a low oil-mist machining fluid spreads into other parts of the machining centre over time. On the one hand, this protects all metallic surfaces and parts but also means direct contact with plastics, paints and electrical components. It was particularly the compatibility of MOTOREX ORTHO cutting oils with plastics and elastomers that interested those involved in the MOTOREX Synergy Project, "Seals and Plastics".

Independent laboratory test at Parker Hannifin®

Parker Hannifin GmbH & Co. KG, a leading seal manufacturer, operates an independent test laboratory in Bietigheim-Bissingen, Germany that is accredited to DIN EN ISO/IEC 17025. Two types of ORTHO cutting oil were tested there for their compatibility with SRE elastomers NBR-1* and HNBR-1* (* for definition see box) to the strict ISO standard 6072.

The compatibility of non-metallic materials with the cutting oil used is of major importance, because it is no use to the operator if he achieves outstanding cutting performance, tool life and surface qualities but uses a machining fluid that causes problems of compatibility with parts made from plastic and elastomer.

The Parker®-Test

The chemical laboratory of the Parker Packing Division® is accredited as a test laboratory for a large number of test procedures, including procedures for the manufacture, testing, analysis and damage analysis of parts made from high-polymer materials, in particular elastomers, to EN ISO/IEC 17025.

In a standard test procedure, two different SRS elastomers were tested for 7 days at a temperature of 100°C.

The test specimens consisted of the following materials:

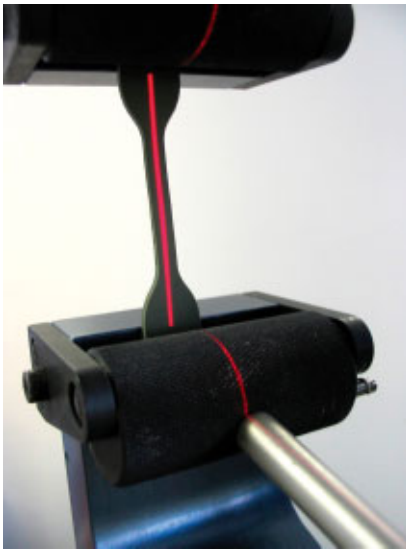
NBR-1 (**A**crylonitrile **B**utadiene **R**ubber) = (standardised to ISO 1629)

HNBR-1 (**H**ydrogenated **A**crylonitrile **B**utadiene **R**ubber) = HNBR mixture from which sheets are produced for test purposes. This is also known as a standard reference elastomer (standardised to ISO 6072)

What is meant by optimum compatibility?

The two central parameters of the Parker®-Test in respect of the compatibility with elastomers are also in keeping with practical requirements – these relate to the hardness, measured in Shore, and the volume of the elastomer. Hence a seal, which seals a cable connection on an electric motor, must not stretch excessively or become brittle under the influence of oil mist. The test is comprehensive and checks the specific weight, the tensile stress, the tensile strength at break, the percentage elongation at break and determines the limiting values within a narrow tolerance band. As a reference basis, the Parker® test uses the measured values of a naturally "mild" HLP hydraulic oil. It would go well beyond the scope of this publication to reproduce the test results in whole or even in part.

The cutting oil must not, under any circumstances, soften the plastics and elastomers or create an excessive increase in volume. MOTOREX ORTHO cutting oils are compatible with modern sealing materials.



Various test procedures are used for the Parker® test: In this case, an HNBR test bar was stored in the cutting oil before the test bar was subjected to a precisely defined test procedure.

PUB
Pibomulti

Perfect harmony:

ORTHO cutting oils with plastics and elastomers

Elastomer seals may only expand or shrink by a clearly defined percentage rate. Even polyurethane pipes must not become brittle or fragile under the influence of the machining fluid.

A test result without the "ifs and buts"

The two tested high-performance cutting oils, MOTOREX ORTHO NF-X 15 and NF-X 46 Hydro, fully meet the requirements of DIN 51524-2. From this it can be concluded that all materials that are suitable for HLP hydraulic oils are also suitable for use with the cutting oils from the MOTOREX ORTHO family.

The knowledge obtained from the test also applies to the latest MOTOREX additive package, which is used for the ORTHO cutting oils. It is highly efficient in conjunction with the selected basic oils, especially at high operating temperatures, whilst still being very "mild". As a result, faultless surface finishes are obtained and all components coming into contact with the machining fluid are protected.

Synergies used and specifically communicated

Only by openly communicating the test results and the knowledge gained, can the user also finally derive real benefit. This is why MOTOREX disclosed all the information about this synergy project to the machine and seal manufacturer. In this way, problem components could be specifically developed and optimised sealing materials deployed.

Do you have any questions on the subject of "cutting oil compatibility with plastics and elastomers"?

We would be pleased to provide you with further information. www.motorex.com

MOTOREX AG Langenthal
Schmiertechnik
Postfach
CH-4901 Langenthal
Tel. +41 (0)62 919 74 74
Fax +41 (0)62 919 76 96

100 % pre-setting

for increased productivity

Ph. Charles
Technical Sales Manager
Product Manager Medical

Stringent requirements

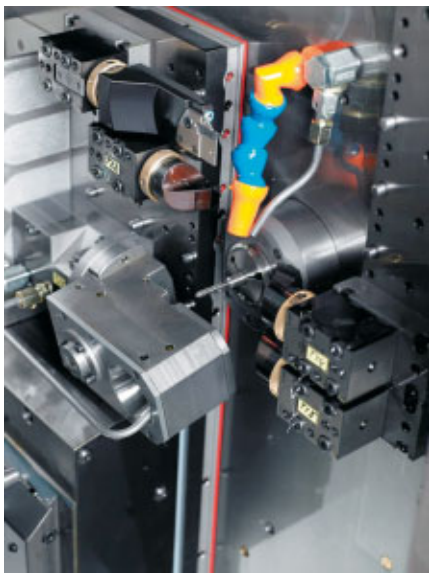
When talking about the TORNOS DECO [a-line] automatic lathes, people are usually referring to their facility to machine highly complex parts and their outstanding productivity, which is the most superior in the market of loose tailstock lathes.

No need to point out that the kinematics of the DECO lathes allow the simultaneous engaging of 4 tools and the counter-operations are executed 100 % in hidden time. The PNC system (parallel numeric control) combined with the TB-DEBO programming software is the only system on the market that allows the interpolation of all the axes at the same time. Developed in 1997 and continually upgraded in terms of ergonomy, machining facilities and productivity; this system will allow the DECO machines to retain their major benefits over the competition for many years to come.

The fact that the applications software is continually upgraded means that our vast clientele can benefit from this at all times. The same applies to the other upgrades, such as any new units that are adapted to the different products of our customers' current product ranges. Our Research & Development department is entrusted with designing and developing new machining solutions and building units based on market requirements. This means that ever more complex parts or machining operations specific to a part type are being executed even more economically. The main market sectors, such as automotive, electronics, medical and horology, in which TORNOS are the leaders, do not by definition have the same requirements in terms of machining solutions, whether we refer to the various parts executed or the different materials.

Precision and small dimensions for horology, complex shapes and tough materials for the medical and dental sectors or even productivity and parts at the cheapest possible price for the automotive and electronics sectors are just some of the very different requirements.

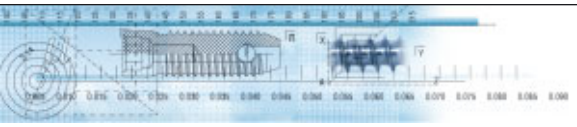
View of the machining area of the DECO 20a lathe fitted with the various pre-setting fast tool change systems.



Machining area of the guide bush on the DECO 20a lathe with the external thread whirling unit, developed by TORNOS.

100 % pre-setting

for increased productivity



Type HSK 32 "cartridge-type" tool-holder system [turning] for the removable insert holders.

Rotating spindle for cross and end operations at the guide-bush and for counter-operation using the removable mandrel, this is repositioned precisely.

High availability of removable mandrels, depending on the type of tool being used.

Reinforcing the "parts per minute" parameter

If there is an overriding factor regarding these various applications, it is the trend to break up the series runs, which is something that happens widely in the market. Having to produce faster at a cheaper price to guarantee on-time deliveries is a parameter our clients must master and guarantee if they are to retain their leading positions. How can further time be saved, knowing full well that it is difficult to do better on a DECO lathe, which already optimises all the machining parameters?

The answer or a good part of it lies in the setting up time for a part, which can be reduced with a well thought-out presetting tool. CNC has always been used as a means to reduce the setting up time for parts undergoing machining (elementary, as one would say…). But against this, not all the lathes on the market have been designed along these lines with respect to the tool system/tool holders/pre-setting units, as was the case with the DECO.

The concept of "pre-setting" was already thought of for the basic DECO lathes, as can be seen by their mobile and modular tool holder system, which allows the client to pre-set the tools in hidden time, without any problem whatsoever.

Success story

As an example of an upgrade executed in this context, we proceeded with several developments for a specific type of part used in the medical sector (bone screw for trauma and spine), which made it possible to pre-set all tools mounted on the 2 screw dies, the end unit and counter-operation system for the DECO 20a or DECO 26a lathes

(here too, the tool system is identical). The turning tool holders, end tools and turning tools can all be removed by way of a "cartridge-type" insert holder (turning) and mandrel (tools fixed at the ends for cross or end turning). Consequently, if a tool has to be changed, the tool holder/unit remains mounted on the lathe and all that is changed is the front section (cartridge or mandrel). A quick and accurate repositioning system, either of the cartridge or mandrel allows the operator to restart production in a very short time.

Pre-setting (TORNOS pre-setter for the DECO lathes or client's centralised pre-setter) allows for very precise tool measurement (geometries of axes X and Z) and height centring (axes Y). This means that the first machined part will benefit from an optimum tool position.

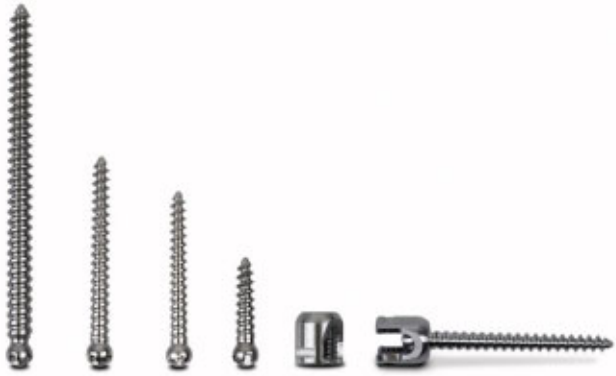
Without wishing to define or list all the parameters associated with productivity, it is obvious that the part cycle time, the setting time and setting up times are amongst the most crucial. The "overall pre-setting" solution is therefore, an important element contributing to the machine's success.

Unit with 3 rotating spindles and removable mandrels. The lateral spindle offset means that millers/drills can be used on the same unit for transverse operations and a saw mill can also be fitted at the top position (offset).

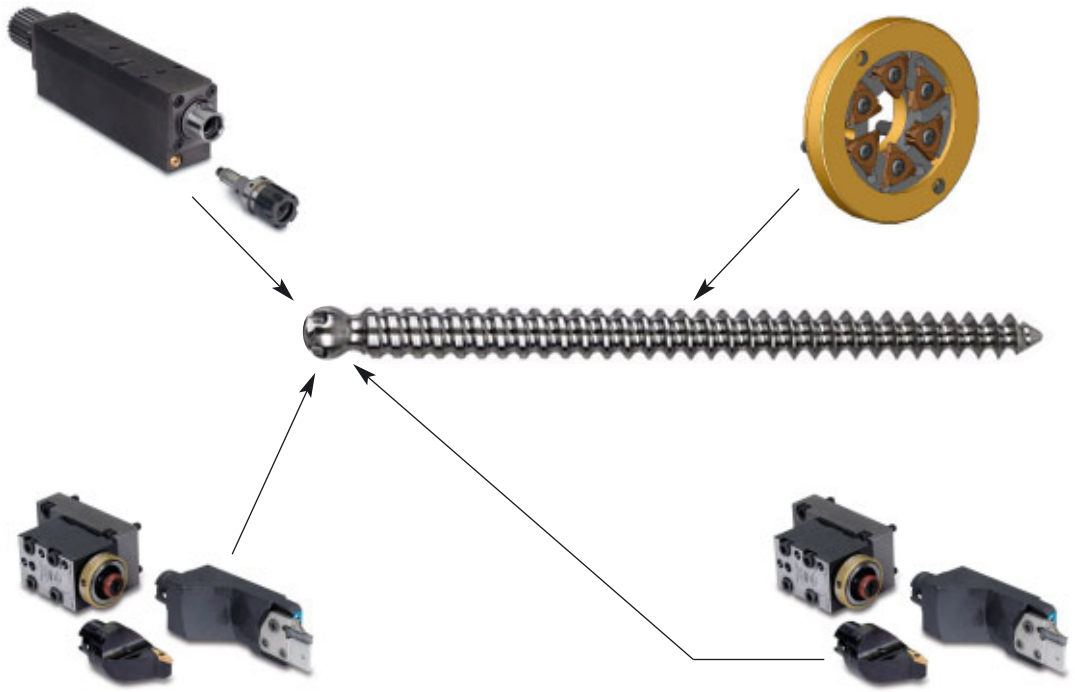
Fixed end spindle for operations and counter-operations with removable and interchangeable mandrels.

Putting into practice

The following example clearly shows the benefits and possibilities of the various developments made in machining different part families. We are referring here to surgical implants for the vertebral column (spine). These parts are machined in two different materials (titanium and 316 L VM stainless steel) depending on the cases undergoing treatment by the surgeons, with the choice depending on the bone deformation requiring correction or the type of fracture. As a general rule, stainless steel



Family of poly-axial heads and screws made from stainless steel and titanium.



View of a screw, approx. 120 mm long, with the different types of tooling used.

components are used for severe deformation of the vertebral column because this steel is more rigid than titanium.

The parts being executed (head and screw) originate from part families with different dimensions, especially with regard to the screws, the lengths of which may extend to more than 130mm. In machining terms, the total annual volume is relatively high but these different parts are machined in campaigns (part batches), hence the need for great versatility. The overall rate of productivity of the lathe is consequently influenced by many setting up and tool changes, based on the different rates of tool wear as a result of the two different types of material. The fact of having a 100 % pre-settable tool system (including the thread whirling unit for the screws) provides convenient use and guarantees highly efficient setting times and tool changes. The fact that possibly several lathes are fitted in the same way also allows for efficient production sequencing.

An open solution

Obviously, it is not only the medical sector that benefits from this type of solution, but also all those involved in precision turning, where there is a trend to break up series runs or use families of parts.

Productivity, performance, short setting up times on the DECO 20a due to 100 % pre-setting tool systems.

Revolving spindle unit and fast change mandrel for cross milling.

Pre-setting head for thread whirling insert holder. Ensures milling directly to the bar diameter without prior turning operation.

HSK 32 cartridge for turning the spherical head section of the screw and for cutting operations.

HSK cartridge for turning the front section of the screw and the rear of the thread .

In terms of machining performance and use, the systems developed on the DECO machines such as the HSK 32 insert holder "cartridges" for turning and fast-change mandrels are quick assembly/dismantling systems coupled with a repositioning system that is precise to within a few microns.

The strength of these systems means that some cutting conditions could be increased, thereby leading to reduced machining times without reducing surface finish quality. In addition, the strength of these various supports also leads to an increase in the useful life of the tools. Finally, it can be said that by adding all these various parameters, the savings in terms of productivity are all the greater.

This solution can be applied to all the DECO 20a and 26a machines already in service.

If you require further information on 100 % pre-setting solutions or on TORNOS activities in the medical and dental sectors, please contact Mr. Charles at the following address:

Charles.p@tornos.com

Program your DECO units with the help of ESPRIT software

With immediate effect, you can now program your DECO single-spindle units with the help of ESPRIT software. This globally available software enables you to program all your machines easily, regardless of their technology, machine type or NC system. ESPRIT incorporates a facility known as "Knowledge Base" with realistic simulation capabilities for all types of machine tools.

.cam...
innovative computer aided manufacturing ag/sa

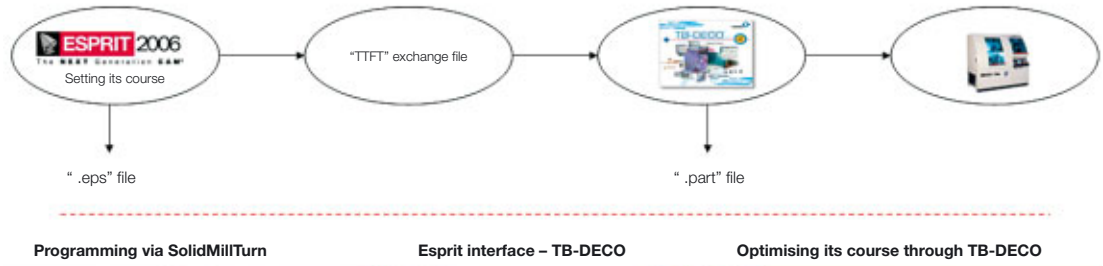
ESPRIT is an innovative product intended for modern machine tools and developed by DP Technology. With its head office in Camarillo, California, DP Technology was established in 1985 by Daniel Frayssinet and Paul Ricard, who bequeathed the initials of their first names to create this company name. These two dynamic Frenchmen are now the sole proprietors of a company employing 100 people, thus assuring a lasting future for DP Technology outside any group or consortium.

Not just a distributor

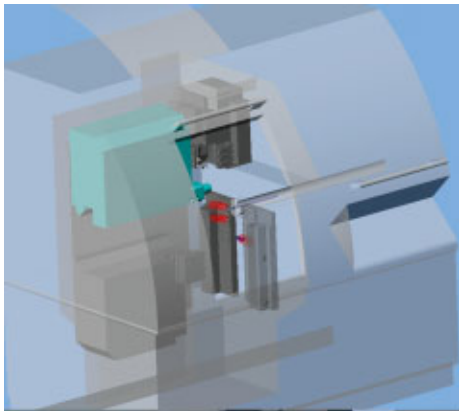
The sole distributor for ESPRIT products on the Swiss market, Innovative CAM SA (ICAM) was established in 1991 and has the core strength of having 12 CAD/DNC specialists on its staff. The highly successful launch of ESPRIT software has enabled us to develop a link between ESPRIT and TB-DECO. This part of the solution is marketed through local ESPRIT resellers around the world. We want to listen to what you have to say about developing specific functions for this CAD solution and in the areas of DNC and machine monitoring.

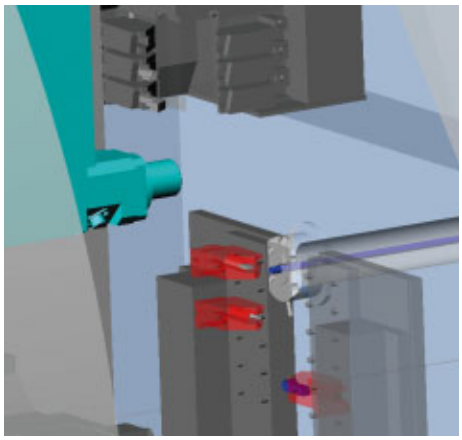
Open software

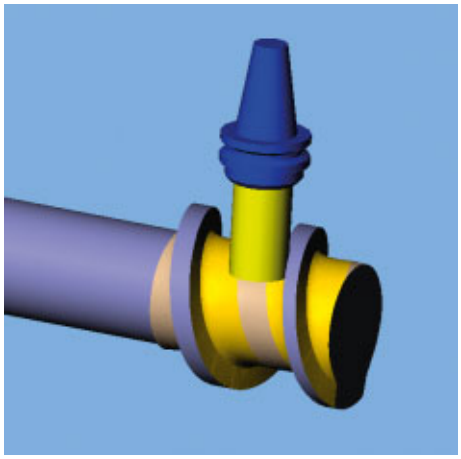
ESPRIT permits direct import of design data from most of the CAD programs on the market. This means that native-format files from SolidEdge, SolidWorks, ProEngineer, Catia and Unigraphics can be imported directly into a CAD environment, including the main descriptions of entities. ESPRIT is also able to import files from common formats such as IGES, SAT, DXF,



Programming via SolidMillTurn | **Esprit interface – TB-DECO** | **Optimising its course through TB-DECO**







DWG, STEP, VDA or STL. Based on the Parasolid kernel, the most widely used product of its kind on the world market, ESPRIT operates entirely in 3D but is also perfectly at ease with 2D concepts.

A single software platform for all types of machining

ESPRIT is not restricted to multi-lathe/multi-spindle turning operations, with up to 22 axes it can also be used for programming all your machining centres with up to 5 axes simultaneously, as well as your electric wire erosion units with 4 + 1 axes. This wide range of options is all available under the same Windows environment and ESPRIT programming capabilities are quick and easy to adapt to any NC-controlled machine tools.

Capitalising on expertise and rationalisation of production operations

The process is managed by KnowledgeBase, a name which speaks for itself. From a single SQL database in a fully integrated manner; it draws together your expertise relating to cutting conditions and machining strategies. KnowledgeBase can be combined with a solids analysis engine to achieve a level of programming automation that has never been equalled in this sector. It is applicable to all technologies employed in machining operations.

ESPRIT and TB-DECO

In collaboration with TORNOS SA, ICAM has developed an intelligent interface for DECO single-spindle machines. This process has been fully certified by the manufacturer. The procedure is extremely simple and enables operators to call on the full powers of ESPRIT to program their DECO machines and any other machine operating in ISO code while retaining all the familiar facilities associated with TB-DECO. All they need to do is design or import a 2D or 3D component and introduce it to ESPRIT, which then familiarises itself with the contours. In the next step, a sequence of operations can be created manually, semi-automatically or fully automatically via the KBM (Knowledge Base). To simplify the process and to make representations of a machine even more realistic, ESPRIT automatically updates tool fixture settings in response to tool configurations. Synchronisation operations and constraints can then be implemented in either ESPRIT or TB-DECO with equal ease. Then all you need to do is to run the simulation, bearing in mind the full extent of the machine environment and managing all aspects of collision monitoring to ensure that the result obtained meets customer requirements. Once these checks have been completed, ESPRIT creates an exchange file in "TTF" format which can be read by TB-DECO. Thereafter, this software picks up the commands involved in creating a PNC file for use on the machine.

To summarise

ESPRIT is the software solution which enables you, by virtue of its intuitive interface and its very high degree of automation to create tool sequences quickly and easily for you to machine simple or complex components on all types of machine, regardless of the size of production run.

To obtain more information about ESPRIT or the TB-DECO interface, please visit:

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www.icam.ch

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Volume production of small parts

A tooling solution for automated longitudinal lathes

Hartmetall-Werkzeugfabrik Paul HORN GmbH

Paul HORN GmbH

The company, Paul HORN GmbH, based in Tübingen, was founded in 1969 by Paul HORN and currently employs more than 650 people worldwide.

Small parts in very large numbers

As a rule, the manufacture of small parts is directly associated with large volumes with as short a time per part as possible – a tricky problem, which has to be solved daily.

Because of the component size, very strict demands are generally made on the surface quality and tolerance range of the workpieces. An automated longitudinal lathe, fitted with tools from HORN, is certain to be an economic problem-solver in this case.

Users

Now, one of the most efficient methods of producing small, turned parts, is to work on an automatic longitudinal lathe connected to a bar feeder in conjunction with precision cutting tools. Work with automatic longitudinal lathes is often concentrated in fairly small areas of the globe in the appropriate environment. Examples on our doorstep are: the Heuberg or the Arve valley in France in the Département Haute Savoie, with more than 800 small to medium sized companies. Approximately 65 % of French automatic turning work is done here.

By specialists for specialists

The age of industrialisation at the beginning of the last century produced the first cam-operated automatic lathes. During the 70s, at the beginning of the computer age, the first NC and CNC longitudinal lathes appeared on the market. Many ideas and designs were also produced by specialists from the respective industrial sectors. As is often the case with machine building, we also come across "old hands" in the niche area of longitudinal lathes and multi-spindle lathes, who commit their virtually unlimited technical skill and pass it on, in order to produce precision small parts efficiently.

Parts spectrum

Amongst small parts, the typical turned part often referred to by many, does not really exist. Every one of us, either consciously or unconsciously, comes into daily contact with components, which are produced on longitudinal lathes. We only have to think of the micromechanics of the horology industry or the ever advancing medical engineering sector, with bone screws and nails, or pins used in tooth implants, gas and liquid nozzles in our heating systems or even just the tip of a ball-point pen.

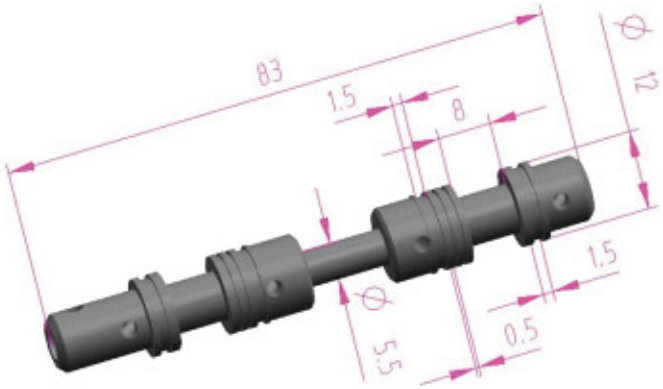
What would become of the ever smaller and more complex connector industry without the connectors made from all kinds of different materials. No vehicle anywhere moves without hydraulic and pneumatic valves, nozzles, suspension, ball pins etc.

Practically all these components are needed in large quantities and frequently have characteristics in common, such as complex shapes and tight tolerances. Take the time to observe the practical items of everyday life and break them down into their individual parts. Try to imagine how these small components are produced.

Practical example

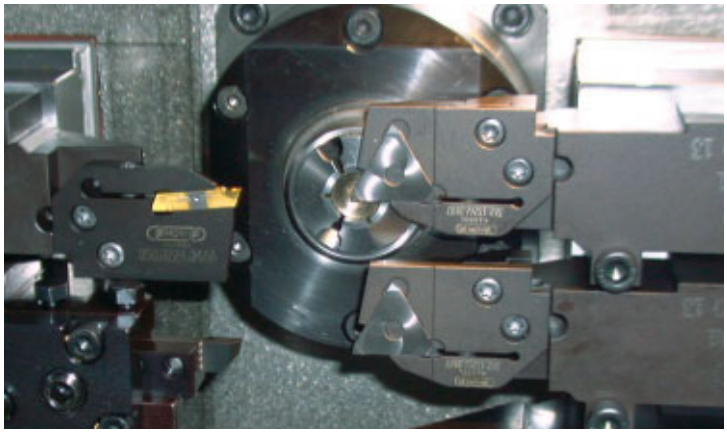
To produce components, such as a piston valve, an automatic longitudinal lathe with bar feeder is unbeatable, as the figures below prove:

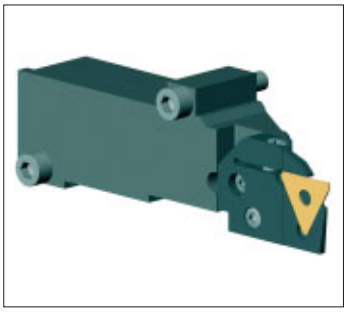
- Batch size 20,000.
- Work piece material ESP65.
- Machining of external diameters using three different tools from the HORN family, types 312, S224 und 264.
- Machining of internal diameters, using Supermini type 105.
- Time per part: 58 seconds.

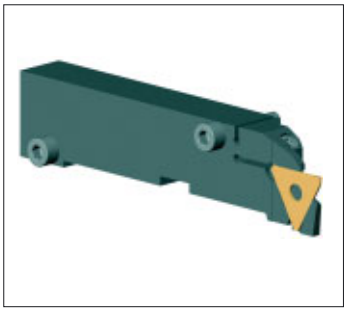


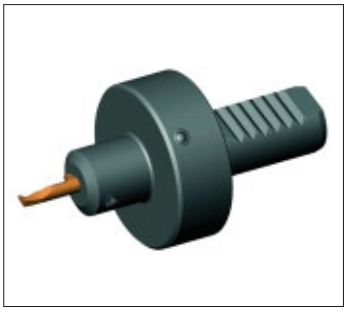
Piston valve

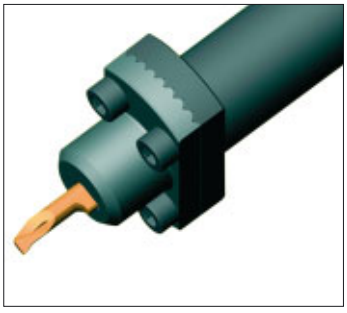
Volume production of small parts











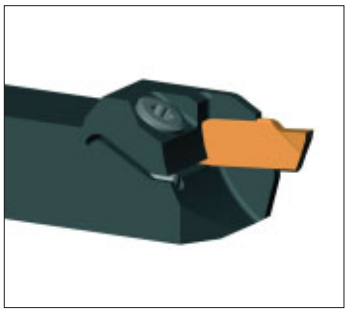
Shortage of space in the working area

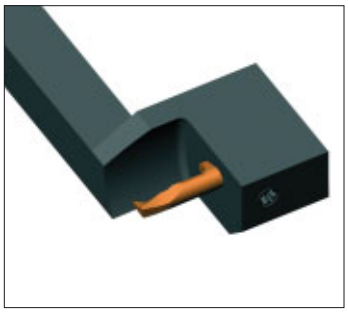
The often complex workpieces usually require a very large number of different cutting tools to produce them. The consequence of this is that a large number of tool spaces have to be accommodated in the working area, meaning that there is only extremely limited space available. The limited space, coupled with the process-related method of working on an automatic longitudinal lathe, presents the designers of cutting tools with a special problem.

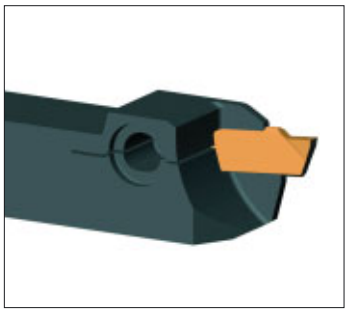
Tools with know-how

The tooling programme from HORN, which has already been tried and tested over many years, provides a solid basis on which to put together a standard programme for longitudinal lathes. For example, Type 105 cutting tool inserts for drilling holes of 0.3 mm diameter or more or the known edgewise, throw-away cutting-tool tip 312, with a cutting width of 0.5 mm or more, form the basis of innovative tool development.

In collaboration of some of the "old hands" already mentioned above, Paul Horn GmbH has developed a family of tools, which attempts to satisfy all requirements. The existing programme certainly does not mean the end of family planning.







Each day we grow and mature with
our problems.

Matthias Oettle R&D
Hartmetall-Werkzeugfabrik
Paul HORN GmbH
Postfach 1720
D-72007 Tübingen
E-mail: info@phorn.de
Internet: www.phorn.de

Winning pair

Solutions based on know-how are frequently deployed to optimise production.
One example will be explained by Mr. Werner Strobel of Walter AG.

A pertinent analysis

Let us see how a detailed analysis, associated with a finely adapted product range, can lead to success. Werner Strobel is in the production shop in front of the lathe. He is providing an interested party with a detailed demonstration of how to increase productivity by using a specific tool or throwaway insert. A test is performed on a production part and the outcome is completely satisfactory.

This is no miracle, because Werner Strobel, a turning consultant at Walter AG in Tübingen, knows his job backwards. He has been working in the field of turning and precision turning for 26 years.

Major savings potential

The basic idea is quite simple: save production time by rationalisation. "When executing small series runs, a tool change every five or ten minutes makes all the difference. What is more, profitability is also much improved".

A complete process

Before starting any project, it is important to analyse the actual situation with the client. What types of parts need to be machined? What are the cycle times? What is the extent of disturbance caused by swarf…? Provided this analysis is correct, it is actually quite often possible to optimise the situation and develop a specific solution with the client. "Basically, it is useful to question everything again after analysing the actual situation. This can sometimes result in adopting completely new solutions," the precision turning consultant explained.

Winning pair

An assortment of tools tailor-made to the ultimate size

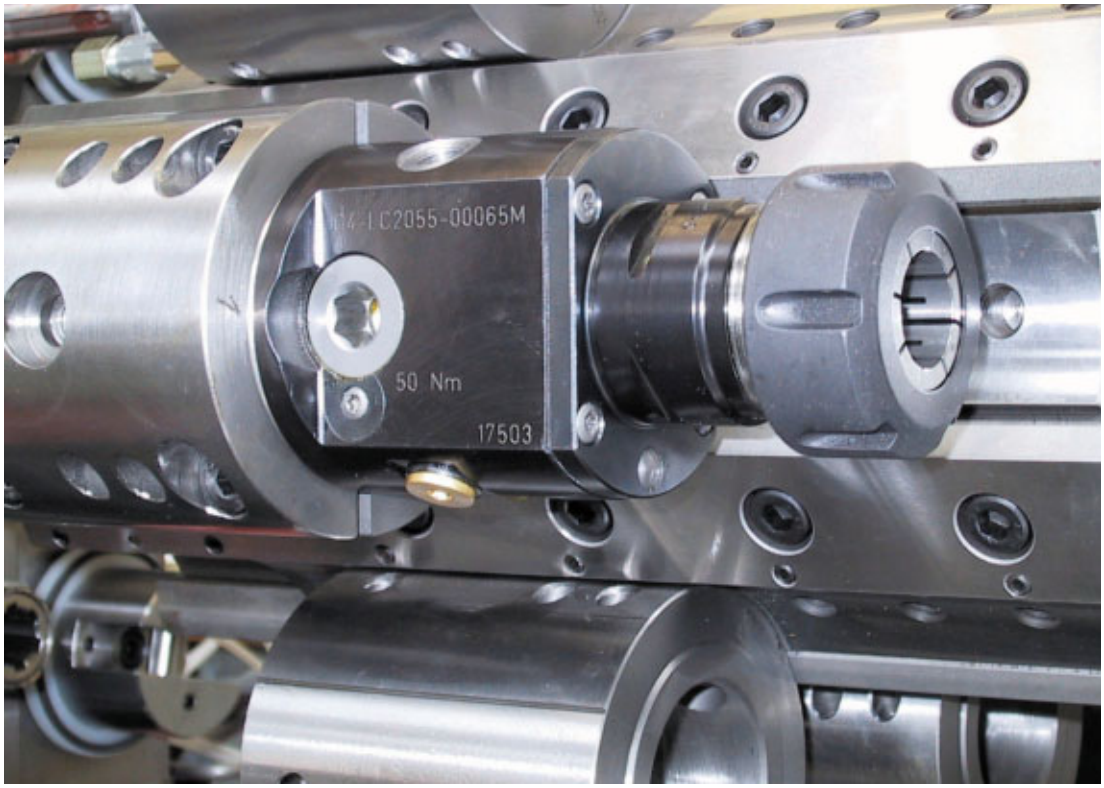
The turning consultant is a specialist who works very closely with the company's field services. For those clients currently being looked after by Walter field services, the need for optimisation and/or consultancy is recorded, for example a client specialising in small part runs and one-offs.

With regard to the small series runs, one is generally faced with highly complex parts that generate a lot of swarf and demand considerable precision – hence, small quantities, coupled with complex machining and relatively long set-up times.

A recent example

Having taken account of all manufacturing conditions, Werner Strobel conducted a feasibility study and suggested re-fitting the client's lathes with the Novex Capto rapid tool change system. Clear financial advantages over the VDI clamping system previously used were identified.

In order to limit carefully the number of tools and keep the investment to an acceptable level, Mr. Strobel produced an assortment of tools specifically adapted to the customer's requirements, namely the Capto tooling, its clamping systems and adapters. Although more expensive to purchase than the same tools for the VDI clamping systems, the Novex Capto tools are the better option in the medium term. The fact that they are easier to handle, resulting in a saving of two minutes and one minute per tool during setting up and pre-setting respectively, led to a realistic saving of 352 hours in one year. In this specific example, the conversion work completely paid for itself at the end of the second year. What, in this case, is impossible to indicate in monetary terms is the high degree of precision of re-



producibility of the tools: ± 2µm. Their re-introduction to another station involves no risk. Even following a tool change, the first part will be executed within the prescribed tolerances. With the Novex Capto, you will not only save time, but also money.

Novex Capto – saves time and money!

If you would like further information about the Capto solutions or advice on turning, please do not hesitate to contact

Walter AG.

http://www.walter-ag.com/

PUB
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The After-Sales Services: common aim

In our columns we very often present innovations, machines or technologies. However, this is not all that contributes to the success of a company. Once the machine is sold, it has to be installed and the customer operators need to be trained. After-sales services must be provided to the clients in the form of advice, assistance and many other such activities.

To find out a little more on this subject and to understand how a machine tool manufacturer overcomes these problems, we arranged a meeting with Mr. Sandor Sipos, manager of the After-Sales Services at TORNOS since the end of 2004.

DM: Mr. Sipos, seen as a whole, what does the After-Sales Services do?

SSi: The After-Sales Services at TORNOS is broken down into five sectors, namely After-Sales single-spindle engineers, After-Sales multi-spindle engineers, Spares, Customer Training (in operation and maintenance) and lastly Service Instructions (documents on operation, maintenance, machine repairs and spare parts identification). We have centralised all activities in one division so that a client, having taken delivery of a new TORNOS machine, can avail himself of these facilities.

DM: Why did you group these activities together in one single division?

SSi: We firmly believe that the "client is a long-term partner" and whilst the 1st machine is sold to the client by the salesman, any subsequent machines will – at least partially – be sold by the After-Sales department.

DM: Could you explain your idea in more detail?

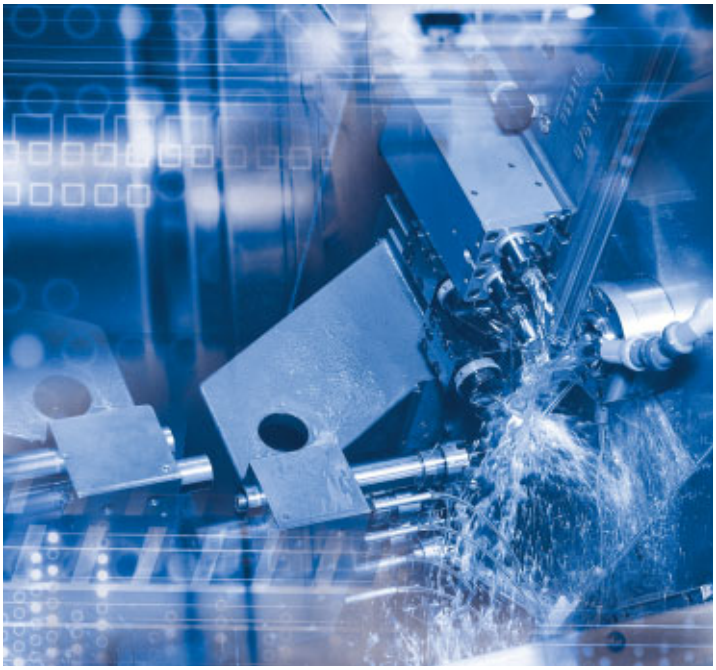
SSi: It is obvious a client that is satisfied with the services provided by After-Sales, will most likely purchase other machines from the same manufacturer. A dissatisfied client will most probably turn to another manufacturer for future machine purchases.

The five sectors mentioned above work together to provide complete customer satisfaction. The activities of the engineers in the field (installation, repair, maintenance) are strongly influenced by the level of training that both clients and engineers have been given. The efficiency of training strongly depends on the quality of the service instructions, which in turn depends on the feedback provided by the engineers. The spares department and the work of the engineers are inseparable. To help both with their work, the service instructions supply part identification tools. As you can see, all this forms a cohesive and inter-dependent whole. To combine these activities into one single organisation was logical to increase our efficiency vis-à-vis our clients.

DM: You are talking of increasing efficiency. What major changes have you undertaken over the last 18 months?

SSi: Right from the outset, I was and still am impressed by the knowledge and skill of our staff. We first carried out an in-depth analysis of the activities of these sectors in order to ascertain the strong and weak points and produce a list of subjects that could prove essential to ensure perfect operation. We discovered that, as a result of the inter-dependency of these five sectors, there was a strong dependency on an irreproachable quality of work vis-à-vis the rest of the company.

We then grouped together the corrective actions into two categories, i.e. the improvements within After-Sales and what we wanted to obtain from the rest of the TORNOS group as an improvement in supporting our activities.



The After-Sales Services: common aim

[S-line]

DM: What were the results of these corrective actions?

SSi: With respect to services, we increased the number of our hotline team (telephone assistance); we increased the engineering workforce and improved their level of training. This meant that we could intervene more quickly and efficiently with the clients.

In the spares sector, we redefined and adapted our stock in relation to consumption; we strengthened the commercial team so that we could respond to customer requirements more quickly and we consolidated our own purchasing group (which is independent of TORNOS Purchasing). In addition to this, we introduced an efficient system to measure our delivery performance. Because of this, all our services are very strictly monitored. The lead-time for our spares has been divided by four over the past 18 months, meaning that we are now four times faster. However, we are quite aware that we can and must still do better.

DM: And what about the other sectors?

SSi: With respect to customer training, we also strengthened our team so that we can respond to customer requirements quicker. This is very important, because well-trained clients clearly work more efficiently and are more likely to be satisfied with our machines.

Finally, with regard to service instructions, we are currently working on several projects with the specific aim of meeting customer requirements in terms of identifying the parts on the machine for ordering spares. This project will be completed at the end of June 2006. We will then be in a position to supply a catalogue of dedicated machine parts for each machine. This will feature drawings to allow the clients to identify the part on the machine, together with its proper reference number. The purpose of this is to allow customers to order the correct part as quickly as possible.

DM: How do you see the future in the TORNOS After-Sales Services?

SSi: These will be very interesting. Many new TORNOS products are now appearing on the market and this trend will continue. This is excellent news, which will have several spin-offs for the division. We will have to train our own staff as well as those of our clients,

The After-Sales Services: common aim

provide service instructions in 25 languages and be ready with the spares for the innovations, whilst continuing to improve our performance in all those sectors, where products are already up and running.

Thanks to the knowledge, skill and willingness of our staff to succeed, I am convinced that we will be able to overcome all these challenges along the way to achieving total customer satisfaction.

DM: To come back to the title of our interview, you refer to a common objective – is this what you mean by customer satisfaction?

SSi: Absolutely, but also more! Namely the vision of integrating all our services towards achieving customer satisfaction. I would also invite our customers not to hesitate to tell us of their experiences – whether good or bad – as this will help us continuously to improve our services.

Sandor Sipos

Sipos.s@tornos.com