

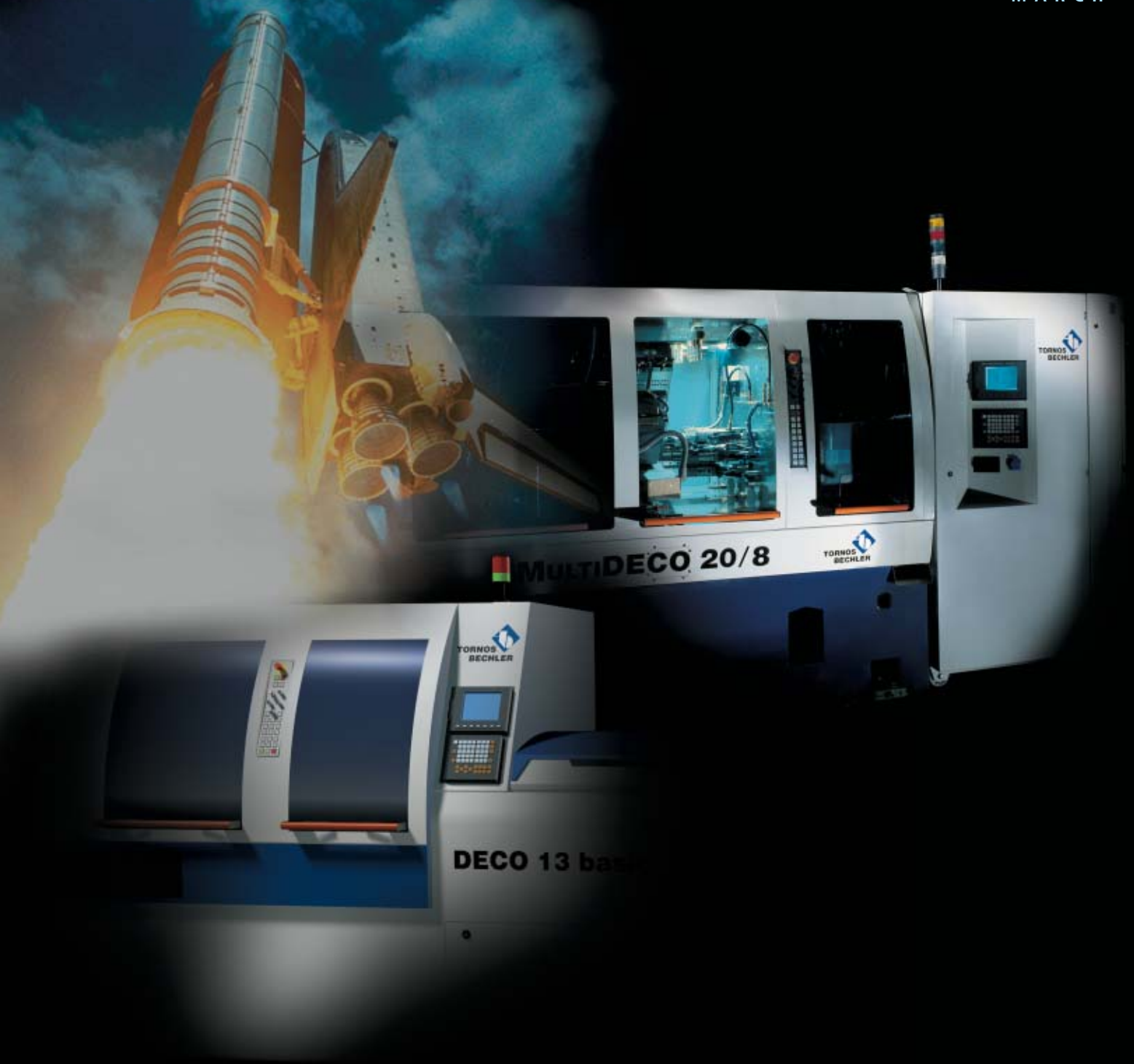
# DECO

# MAGAZINE

# 12

1/00

MARCH



**MULTIDECO : OPTIMUM SETTING UP AND WORKING**




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<b>F</b> Editorial – Anton Menth	3
MOTOREX – une parfaite combinaison de haute technologie et de tradition	4
Nouvelle fonctionnalité de G913: Ebavurage de la chute par interpolation des axes Z et X	6
Position d'extraction sur MULTIDECO	7
Options: Palette de plus en plus vaste!	8
MULTIDECO: Mise en train et travail optimisés	10
DECO 13 basic i: Diversification de la famille DECO 2000!	13
Le système DECO 2000 au service du médical	14
DECO 2000: Une réelle alternative aux machines à cames!	16
MULTIDECO 20/8: Et de trois MULTIDECO!	21

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<b>D</b> Editorial – Anton Menth	23
MOTOREX – ein gesunder Mix aus High-Tech und Tradition	24
Neue Funktion des G 913: Stangenende-Entgratung durch Zwischenschaltung der Achsen Z und X	26
Auswurf-Position auf der MULTIDECO	27
Optionen: Die Auswahl wird immer grösser!	28
MULTIDECO: Inbetriebnahme und Zerspanung optimiert	30
MULTIDECO 20/8: Und noch eine MULTIDECO!	32
DECO 2000: Eine reelle Alternative zu den Kurven-Automaten!	34
DECO 13 basic i: Erweiterung der Serie DECO 2000!	37
Das System DECO 2000 im Dienste der Medizin	38

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<b>E</b> Editorial – Anton Menth	41
MOTOREX – the perfect combination of high technology and tradition	42
Options: An ever expanding range!	44
New functionality of the G913: Chip deburring by interpolating axes Z and X	46
Extraction position on the MULTIDECO	47
DECO 13 basic i: Diversification of the DECO 2000 family!	49
MULTIDECO: Optimum setting up and working	50
The DECO 2000 system serving the medical industry	53
DECO 2000: A real alternative to cam-operated machines?	56
MULTIDECO 20/8: And three MULTIDECO machines!	59

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<b>I</b> Editoriale – Anton Menth	61
Il sistema DECO 2000 al servizio del medicale	62
Opzioni: una gamma sempre più vasta!	64
Nuova funzionalità del G913: Sbavatura dello spezzone per interpolazione degli assi Z e X	66
Posizione d'estrazione sul MULTIDECO	67
MOTOREX – una perfetta combinazione dell'alta tecnologia e della tradizione	68
MULTIDECO: Messa a punto e lavoro ottimizzati	70
MULTIDECO 20/8: E le MULTIDECO sono tre!	72
DECO 13 basic i: Diversificazione della famiglia DECO 2000!	73
DECO 2000: Una realtà alternativa alle macchine a camme!	74

### IMPRESSUM DECO-MAGAZINE 1/00

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to turned parts:

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## Dear readers,



Looking back, 1999 would have been a good and eventful year for the TORNOS-BECHLER Group. TORNOS-BECHLER succeeded in increasing its share of a highly competitive but constantly reducing market, thanks to the DECO 2000 concept. The consolidated turnover increased from 7 % to CHF 286 millions, and the cash flow situation also showed a considerable improvement.

Another event, which merits mention, is the successful introduction of SAP at our headquarters in Moutier. We have been working with this fully integrated computer system at all levels of the company since the beginning of October. Whether dealing with purchases of raw materials, equipment management, parts construction, assembly, sales or even after-sales, SAP manages all the processes. We would like to introduce SAP in all our subsidiaries during the course of this year.

The year 2000 bug which was announced everywhere, didn't affect us at all, since we changed our entire computer system. At TORNOS-BECHLER time does not stand still – we are continually and tirelessly working towards evolving the company.

At the start of the year, TORNOS-BECHLER resumed some of the activities of Schaublin S.A., namely CCN lathes and CNC turning

and milling centres. This company, located at Bévillard, employs 120 staff. As part of the process of restructuring our organisation into business units, this new commercial venture, referred to as TORNOS-SCHAUBLIN, will find its place alongside the single and multispindle work. We firmly believe that this clear definition of work and the direction of the Group towards product types, will considerably improve the company's productivity.

In keeping with the saying «whoever does not progress, goes backwards», TORNOS-BECHLER will again continue to be an innovative, customer-orientated company. This will be through the introduction of new products, based on DECO technology. At the SIMODEC trade fair, held in the middle of March 2000, we present the new MULTIDECO 20/8, together with

the characteristics of another DECO 13. This model, referred to as the DECO 13 basic i, represents the new standard for the market segment of simple to medium complex parts. You will find more detailed information on this subject in this edition of the *DECO Magazine*.

TORNOS-BECHLER has set itself very demanding targets for the year 2000.

In order to face up to market demands, we shall do everything to demonstrate how our products perfectly meet your requirements and provide the best possible service to our clients: TORNOS-BECHLER wants to provide the ultimate service.

Anton Menth  
C.E.O.

*MOTOREX – the perfect combination  
of high technology and tradition.*

## *A brief look back*



**This family-run firm started its activities by producing leather and floor maintenance products under the name of REX. During the course of years, and with the growing development of motorisation, the company's activities underwent a gradual change. In 1947, REX became MOTOREX.**

**Nowadays, MOTOREX is the largest Swiss oil refining company, specialising in the research, development and production of cutting and lubricating fluids, as well as maintenance products for industry and the machine industry.**

### **Langenthal: the production site of a company with plenty of ideas**

**There is a permanent atmosphere of innovation at the head office in Langenthal. It is here where complex formulae are researched and developed and where new products are designed, produced and distributed. By virtue of this structure, MOTOREX was awar-**



**ded the Marketing Prize of the GFM Institute (a well known Swiss marketing company) in 1998.**

**MOTOREX clearly demonstrated its skills through the continuous development and design of very high quality lubrication products. A considerable volume of other, similar products, such as detergents, care and maintenance products, sprays and additives, complete the range of products on offer.**

**Special attention is paid to the environment at Langenthal, with the result that bio-degradable products have been in use for several years now. Coupled with**



*To save the environment, basic oils are conveyed by rail to the largest cutting fluid store in Switzerland, having a capacity of 7,6 million litres.*

the use of inexhaustable raw materials, they represent an optimum complement.

### Segmented product lines

The complete MOTOREX range currently includes more than 1'500 references. These are clearly defined by product lines, based on their utility. Nowadays, the BUCHER A.G. MOTOREX company offers more than 13 complete lines for all areas of industry and mobility, ranging from product series for snow vehicles to lorries. Today, a large number of the MOTOREX product lines can be found in more than 50 countries and the export trend is growing.

However, MOTOREX has long been involved in the particular characteristics governing the industrial use of cutting oils, cooling emulsions, cleaning agents and so on. The result of this is MOTOREX SWISSLINE – a complete product line reflecting the considerable know-how of MOTOREX in the machine industry.

### Fairly large, but not a multinational

Already established as a partner for many years in highly acclaimed companies in all sectors of industry, MOTOREX is now of a good size to meet the challenges posed by some of its demanding clients. Based on the specifications and limitations associated with the solutions to be provided, development is carried out in consultation with the customers, such as watch makers, small-parts turning companies and so on.

This research is frequently the starting point for a new product line and a long-term partnership. MOTOREX is fully aware of the fact that these values are somewhat overlooked by the large multinationals, meaning that it can provide an even better service to its customers.

MOTOREX employs 185 people. Whether these are technicians, chemists, engineers, highly qualified specialists, administrative or technical staff – all strive towards one common goal, namely customer satisfaction.



*MOTOREX is conducting research and development work in new products in its own laboratories and works with specialists throughout the world in order to exchange experience.*

### Quality at all levels

The quality provided by MOTOREX is seen at all processing levels of the company, and corresponds to ISO standard 9001. The personal commitment of all members of staff to this philosophy, coupled with their conscientious awareness of environmental interests, have created a certain degree of synergy, thus providing an additional guarantee of quality.

*In a future article, we shall be presenting the professional advice of MOTOREX concerning cooling emulsions and their care.*

### MOTOREX – Oil of Switzerland



*The final product in the green-silver MOTOREX drum, representing the ultimate requirements of the modern machine industry.*

E

# Options: An ever expanding range!

The range of possibilities for all DECO 2000 and MULTIDECO models is steadily growing. The DECO 2000 system is still more user friendly, offers greater possibilities and safety, etc.

This edition highlights 2 new features for the DECO 2000, 13 mm capacity and, for the first time in *DECO Magazine*, a new option for the MULTIDECO.

## Option 5255

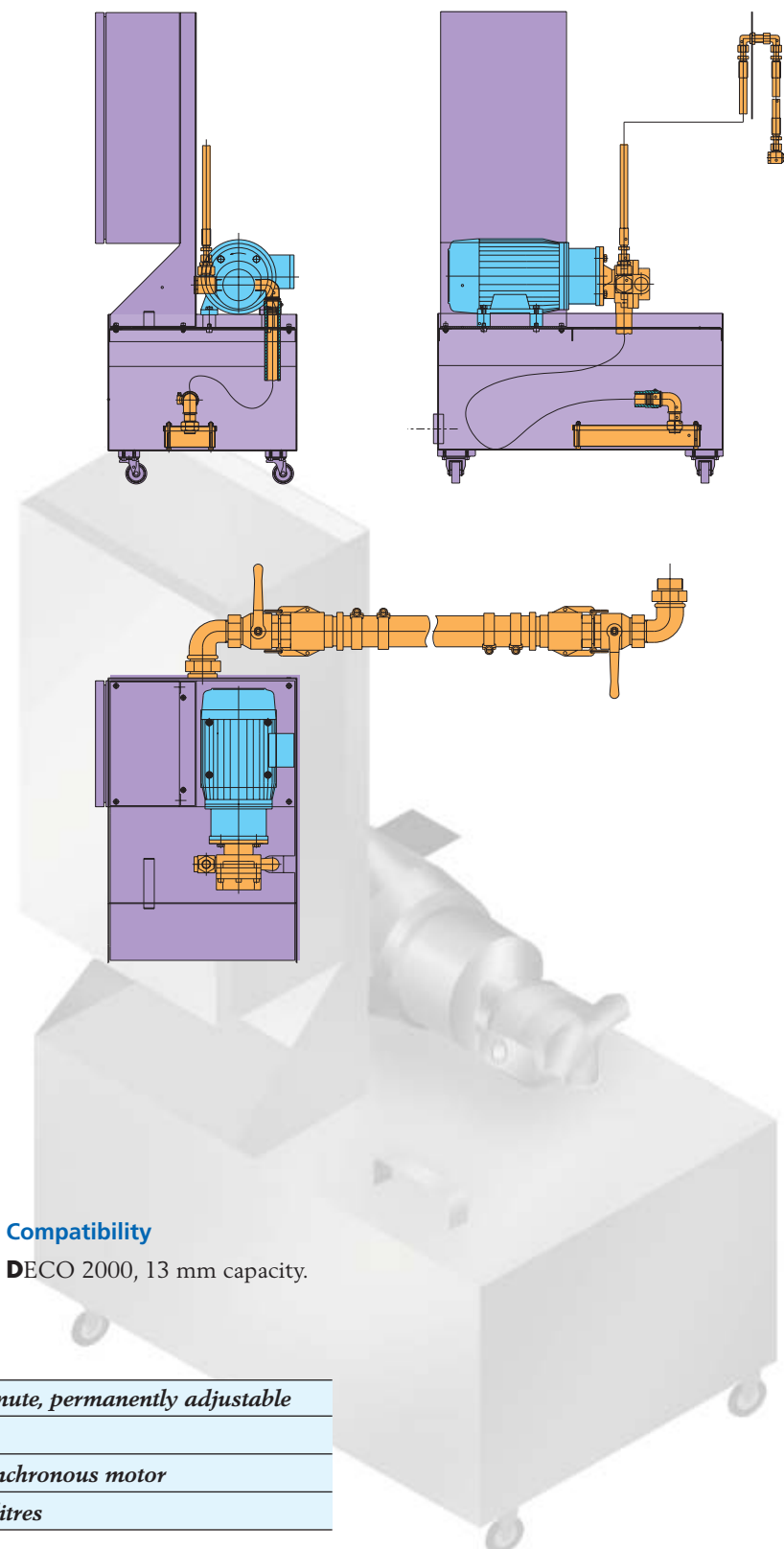
**Tool lubrication pump, 20 bars with additional tank.**

### Application

This option comprises an additional tank fitted with a pump, which is controlled by a frequency converter. This device considerably increases tool lubrication whilst drilling with oil holes drills or when high volumes of chips evacuation. The unit is connected to a tool or even a tool system of the lathe. The cutting fluid circuit can be adapted to any station thus making it possible to improve lubrication and chip evacuation in a precise way.

### Comments

If the lathe is fitted with a Sermeto chip conveyor (option 5420), then option 5255 is replaced by option 5250. This is because of the motor-pump assembly of option 5255 on the oil tank of the chip conveyor, option 5420.



### Compatibility

DECO 2000, 13 mm capacity.

### Technical characteristics

Flow rate :	1 to 25 l/minute, permanently adjustable
Max. pressure :	20 bars
Nominal power :	1,5 kW, asynchronous motor
Tank capacity :	approx. 60 litres

### Option 4900

Device for extracting, evacuating and recovering long parts.

#### Application

A pneumatic actuator with long rod extracts the parts via the counter-spindle to the rear of the lathe onto a recovery trough. This mobile trough then travels back to release the parts away from the lathe. A second actuator tilts the parts onto a sloping recovery section.

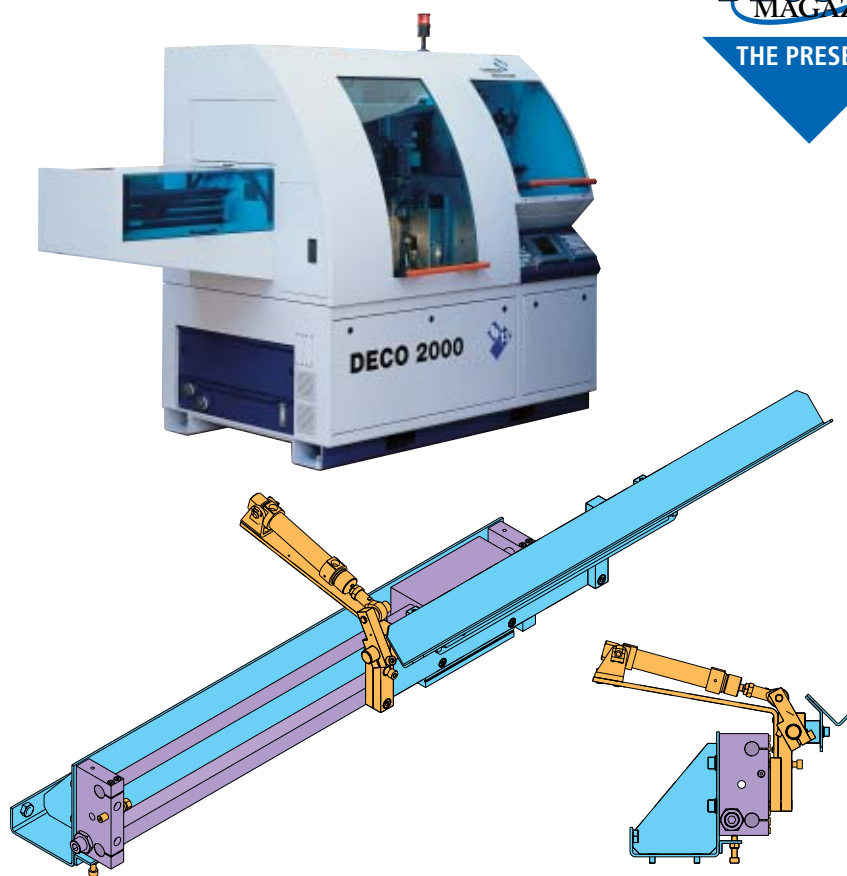
An integral protection hood is located above the recovery unit.

Using this device it is possible to produce long parts rationally, without this entailing a considerable increase in the space required.

Assembly is compatible with the swan-neck type, scraper conveyor (presented in *DECO Magazine* 11).

#### Compatibility

DECO 2000, 13 mm capacity.

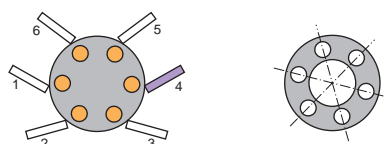


#### Technical characteristics

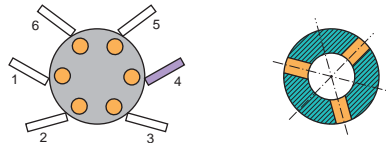
Diameter of parts being extracted:	4 - 16 mm
Max. length of parts.:	565 mm
Max. length beyond counter-spindle:	100 mm

### Options 2420, 2430, 2440 and 2450

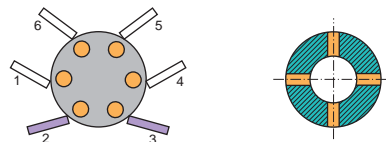
Cross drill for the MULTIDECO 26/6.



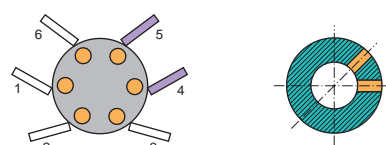
Execution of six 60° off-center drillings



Execution of three 120° cross drillings



Execution of two 90° cross drillings

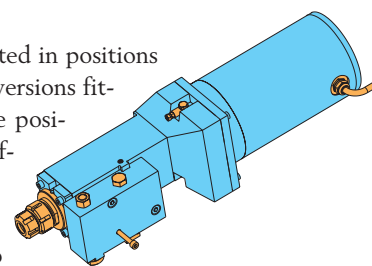


Execution of two 60° cross drillings

#### Application

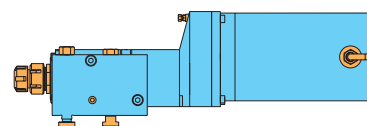
These standard drills are designed to be mounted in positions 2, 3, 4 and 5, and can be used on all machine versions fitted with spindle stop. However, it is with the positioned stop versions (pos. 4) that this option offers the full extent of its potential.

Using this drill, it is possible to execute the following, for example: two cross 90° bores, two 60° bores or three 120° bores (with the stop version positioned in position 4 on the MULTIDECO 26/6).



#### Compatibility

MULTIDECO 26/6.



#### Technical characteristics

Motor power:	0,75 kW
Drill speed:	by electronic variable speed drive unit, 1000-6000 rpm
Spindle body:	E25 (swing diameters 0,5-16 mm)
Reduction sleeve:	E25/E20 (swing diameters 0,5-13 mm)

The latest ideas for the DECO 2000 and MULTIDECO to make life easier.

# New series of tips!

## New functionality of the G913: Chip deburring by interpolating axes Z and X.

With the increased power of the TB-DECO and at the request of our customers, the deburring process has undergone modification. Since the launch of the TB-DECO 5.01, the G913 macro can effect deburring of the dropped part in two ways:

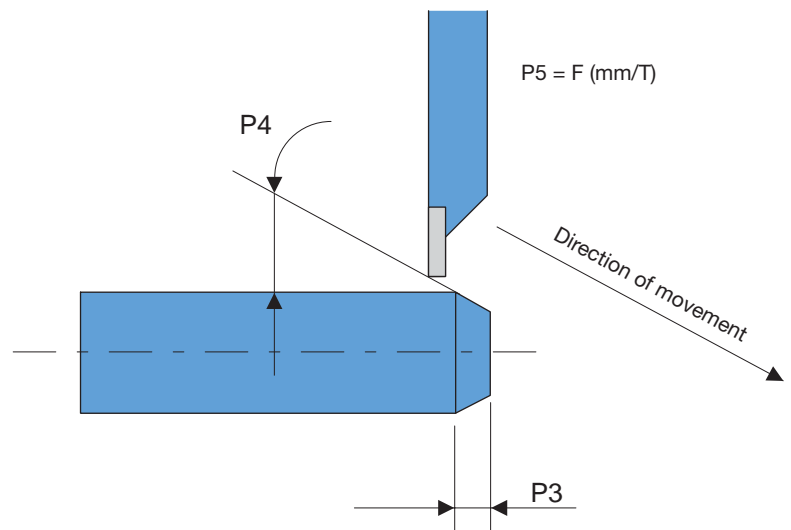
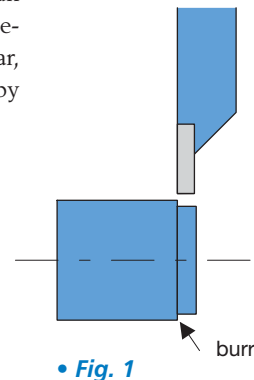
1. In the conventional way, by mere hobbing of the cutting tool in X (standard case used to date).
2. Or by interpolating axes Z and X (turning), so as to obtain a chamfer, the angular length and value of which can be parameterized.

This second option is of great interest, for example, when using a cutting tool with a straight insert.

The reason is as follows: standard deburring of the dropped part by hobbing (see above) eliminates any burrs at the end of the bar but could lead to creation of another burr (Fig. 1).

This second burr is brought about because there is no angle on the cutting chisel. When using the

second option (interpolating X Z), no burrs will be found at the end of the dropped part. You can now be assured that when the device returns to load the new bar, this will not be jeopardised by burring.



**Programming:** 3 parameters can be programmed following G913 to define the length and angle of chamfer to be executed.

P3 = length of chamfer

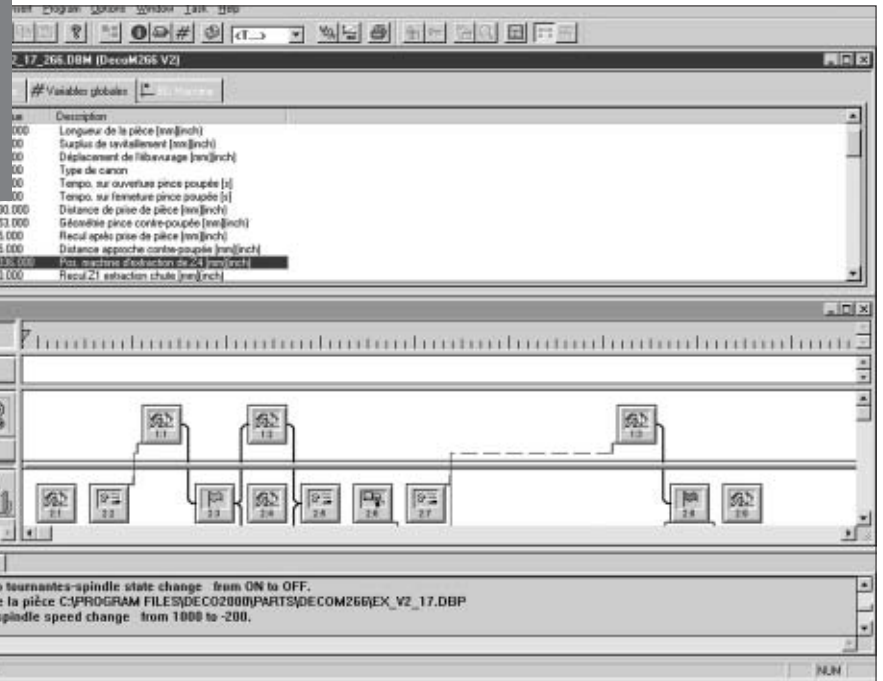
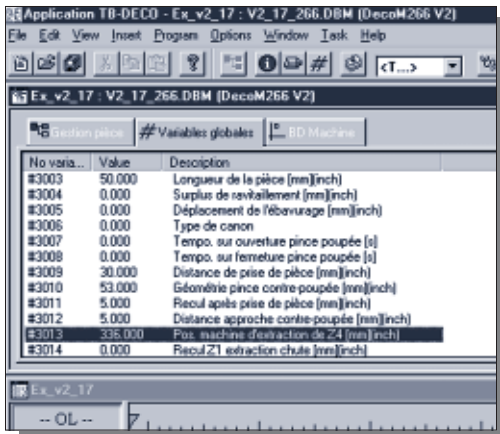
P4 = value of chamfer (default = 30°)

P5 = feed during chamfering (default = #3002)

Only parameter P3 is compulsory. Parameters P4 and P5 can be omitted. In such cases, the default values will be taken into account.



# Extraction position on the MULTI-DECO



With the latest TB-DECO version, the extraction position (variable #3013) is no longer limited to the machine reference position.

As a reminder, the extraction position of axis Z26 is between 335 mm and 337 mm for the MULTI-DECO 26/6 and between 299 mm and 301 mm for the MULTI-DECO 20/6. This extraction restriction can have a negative effect on production time if the counter-operation period is longer.

Adjustment of the part ejection device is by way of the counter-spindle in the reference position, by admitting 1 mm play between the actuator and ejection device. This position has been adopted so as to avoid any collision between the ejection device and the part located in the counter-spindle, with the axis reference at Z26.

**The purpose of the tip proposed here is to:**

1. Position the counter-spindle for part extraction, so that there is minimum travel following counter-operation machining.
2. Reduce the travel of the counter-spindle, whilst programming a part not requiring counter-operation machining.

The essential aim of these two operations is to reduce production time.

## Tip

Assuming that the travel of the ejector actuator and length of part in the counter-spindle (variable #3009) are known, we can calculate the remaining distance, so as to avoid any collision between the ejection device and part, where the axis reference is Z26.

The extraction position in the G910 macro has been modified. The new position is between 257 mm and 337 mm for the MULTI-DECO 26/6 and between 221 mm and 301 mm for the MULTI-DECO 20/6, knowing that the actuator travel in both cases is 80 mm.

The G921 cycle calculates the remaining distance between the part in the counter-spindle and the required extraction position. If the distance is not complied with the user's requested extraction position, an alarm will be triggered.

## Adjustment

Manually position axis Z26 to the required extraction position. Adjust the part recovery device and ejector to the front position! **Check the part recovery device operation for possible catcher-slide collision when machining in post 1 (X1; Z11).** Input the extraction position value in variable #3013.

## Comments

If, following counter-operation, the extraction position is smaller than the machine position, there is a risk of collision with tool T17. The cycle automatically calculates the positions and informs the operator via a message. In such cases, the operator must program the release of tool T17 before proceeding with extraction.

E

# DECO 13 basic i: Diversification of the DECO 2000 family!

The family of single-spindle lathes with counter-spindle, benefiting from the DECO 2000 concept, is being developed towards simplicity itself.

At the SIMODEC, TORNOS-BECHLER unveiled, for the first time in the world, the characteristics of the first of a new series of single-spindle lathes with counter-spindle, based on what has now become the classic (yet still innovative) DECO 2000 concept.

This new machine, called the DECO 13 basic i is intended to offer a rational and financial alternative to the current solutions for machining single parts, and being reasonably complex.

Incorporating a new revolutionary bar-feeder, the design draws on all the experience acquired with the DECO 2000, namely:

- ◆ rationalisation of components
- ◆ standardisation of elements
- ◆ adapted quality (avoiding «excess quality»)
- ◆ incorporation of the PNC-DECO
- ◆ simultaneous management of all axes
- ◆ etc.

This new lathe is also designed to accommodate the vast range of options and peripherals already available on the Deco 2000, 13 mm capacity lathe.

With these elements it is now possible for TORNOS-BECHLER to offer a PNC lathe with 6 axes, with its own pre-set tooling system and running on TB-DECO software, at a highly competitive price.

## General characteristics

- ◆ 5-position tool system (die chaser type) for rotating and turning tools.
- ◆ End unit on 3 axes (facility to centre the tool on the bar, on

3 axes) thus considerably reducing setting times.

- ◆ Integrated counter-spindle combined with end working attachment.
- ◆ Turning in several passes and bar threading without the counter-spindle travelling back into the bush (headstock style).
- ◆ Machine geared towards simplicity.
- ◆ Reduced overall space requirements with integrated bar feed, 3 to 16 mm capacity.
- ◆ Rapid ejection of the part away from the machining area.
- ◆ Large cutting fluid tank.
- ◆ Optimum chip removal.

## Range

With this new machine, TORNOS-BECHLER is offering an alternative to the DECO 2000, 13 (16) mm capacity, for all parts requiring up to 6 axes on 4 tool systems.

The DECO 13 basic i is also a new «turn-key» solution. The basic i machine is perfectly equipped to deal with the usual industrial constraints. It is no longer necessary to associate it with a vast number of options for its application, thus providing a high-performance production tool responding to all requirements.

Come and discover this latest innovation at SIAMS 2000.

Available from August 2000.



## Technical characteristics

Bar passage:	13 (16) mm
Length of part in chuck:	160 mm
Max. spindle speed:	12'000 rpm
Max. spindle power:	3,7 kW
Max. number of tools at bush:	8
Max. number of tools on end unit:	3
Number of counter-operation tools:	3
Max. number of tools:	14
Max. counter-spindle speed:	12'000 rpm
Max. number of axes:	6 (8/C axes)

# MULTIDECO: *Optimum setting up and working*

The hybrid concept of the TORNOS-BECHLER automatic multispindle lathes, coupled with the power of the DECO 2000 concept, resulted in significant benefits both with respect to time and working methods. The design functionalities clearly simplified the operations to be carried out at all stages of the production process, thus leading to financial savings and reductions in time for the operators of this type of machine.



In this article, we will attempt to break down the entire design and manufacturing process for a new part and then analyse the strengths of the MULTIDECO system.

## Working method

On receipt of an offer, the machine operator must analyse his availability and facilities for executing the part required by his client, or even contemplate a capital investment. He must also estimate or calculate the time per part, as well as any downtimes, to arrive at the final price and hence, the profitability of the operation.

With the TB-DECO, it is quite simple to program in the part and work out the actual machining time. Determining productivity is therefore accurate and no longer esti-

mated. This substantially avoids estimation errors, which are likely to lead to a considerable reduction in profitability. Since this operation may be carried out right from this moment onwards, programming is in masked time!

Once the deal has been concluded, the project must now be physically implemented. The concept of using standard tooling with inserts. The vast benefits provided by the slides now make it possible to machine even longer parts and proceed with numeric corrections of tapered diameters.

Not only does it dispense with specially formed tools, the MULTIDECO also improves performance. Once the settings have been input for the standard and pre-adjustable tool holders, all that

remains is to implement and transfer the program.

From this point onwards, the machine is stopped for purposes of executing this work. Let us start on the assumption that the part in question is new and requires completely new settings. The pre-adjustable tools and widespread standardisation considerably improve setting work, which, it must be admitted always takes far too long. Using the tool pre-settings and TB Deco, the actual setting time on the MULTIDECO is kept as short as possible, but what is more, the first part machined will practically be good to within 0.05 mm.

Machining can now start, but what is important here, is to optimise the process prior to production.

What remains is to centre the tolerances using the offsets. The facility of activating or deactivating the various stations \* means that all tools can be mounted on the machine at the start of setting work, and these need only be activated at the time required. This too is a benefit when investigating a problem during the optimisation process, since the tool can be freely deactivated without having to be dismantled. The fine-adjustment parameters are modified directly at the machine control, without even having to stop the machine.

**Production can now start!** Correction is inevitable, as the tools start to wear. Work to optimise the dimensions of one end by a micron can be carried out quite safely using the offsets without having to stop the machine (as opposed to using a vernier) and you can be sure that the requirements are still met. The «tool life management» option will warn the operator once a pre-defined number of parts has been executed by a specific tool,

settings. What are the benefits of the MULTIDECO in this respect?

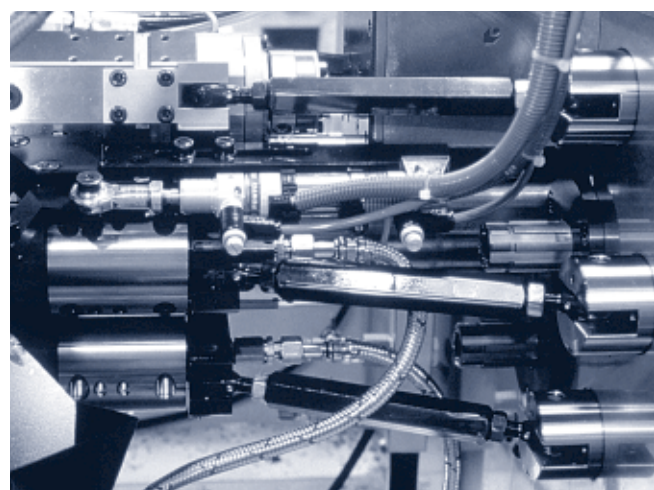
**The** long slide path (80 or 100 mm) offers the advantage that tools with standard inserts can be mounted at the same spot and that different parts can be machined without having to change or move the tools. The pre-set and standard tools dispense with tool grinding (thus saving time). The tooling system provides less tool change from one part to the other (for part changes, only the drills and specific tools for the part have to be changed, since the machining differences are executed by the program. At the time of setting, all tools can be released and the barrel indexed. This operation will allow semi-machined parts to be cut, without having to dismantle the tools.

**Where** part families require machining (parts having the same diameter), then this can be done by merely changing the program and length of the bar feeder, if necessary. In other words, the changeover from one part to another takes place within a couple of minutes. Machine capacity is increased by the use of the integral bar feeder (from 26 to 32 and from 20 to 22 mm). Feed collets have been dispensed with. Considerable savings in time are achieved when changing bar diameter. This auxiliary device also completely eradicates the problems associated with feed collets, (wear, cost, short parts). The facility to change mounting chucks very quickly (Hainbuch, Unilock) to reduce the setting change time

even further, says a lot for the MULTIDECO technique.

### A new production run can now start!

In our previous edition of *DECO Magazine*, we presented the MULTIDECO with respect to its precision. In this edition, we shall talk about setting changes. These two aspects are, of course, ex-



tremely important, but when coupled with the productivity of a lathe, all these factors contribute to the only really important, tangible factor, namely that the number of parts produced matches customer requirements on completion of the period in question!

**The** use of the MULTIDECO, coupled with all the benefits (see box), quite simply means that more parts are machined!

**This**, therefore, increases the profitability of MULTIDECO users and their competitiveness!



and whether it needs changing or adjusting. If nothing happens, the machine will shut down by another counter, which is likewise programmable. This option can also be used for programming chuck cleaning, for example, or for any other periodic maintenance purpose. The use of tool holders with incorporated coolant pipes, simplifies and guarantees coolant at the exact location required, thus increasing tool life.

### Change in settings

Once production of the first part is complete, we must now change

<i>Programming in masked time</i>
<i>Pre-adjustment and standard tools</i>
<i>Numeric control (no need to assemble or produce machining cams)</i>
<i>Standardised lathe setting</i>
<i>Rapid correction and optimisation</i>
<i>High level of production and precision</i>
<i>Tool life management</i>
<i>Quick setting changes</i>
<i>Lower investments for setting-up (cams, gears, form tools).</i>

# The DECO 2000 system serving the medical industry

The COULOT company, a longstanding partnership

Located in central western France, in the town of Châtellerault, away from the traditional small-parts turning centre, the COULOT company forged a solid reputation in the field of medical parts.

At Châtellerault, at the heart of a residential quarter, 500 metres away from the town centre, Mr. COULOT opened the doors to his company. The COULOT company is the brainchild and passion of Gabriel COULOT.

Mr Gabriel COULOT, 44 years, runs the company with his wife. As a holder of a CAP in general mechanical engineering, Mr. COULOT started this job 17 years ago and quickly climbed the ladder to run his own company at the age of 30. The COULOT company was established in 1985 through the purchase of a small company on a lease management basis. In 1987, Mr. COULOT purchased the business; at that time the company only employed one person. Mr. COULOT, who received a salary in the form of a regional PME, provided the necessary impetus to his company as well as continuing with his work.

In 1988, Mr. COULOT left his job and devoted his entire time to the company. His first NC machine was purchased in 1989. It was an ENC-16 with a six to eight month lead-time, which was put into service at Moutier. The application was precision micromechanics. At



that time, Mr. COULOT had no knowledge of small parts turning whatsoever. He purchased this machine because it had an automatic bar feeder, and there was no need to stand at the foot of the machine each time a bar was completed. Mr. COULOT's company employed three people: Mr. and Mrs. COULOT and one labourer.

Nowadays, the company is still managed by Gabriel COULOT who also deals with the commercial side. His wife Christiane is in charge of administration and finance. Their assistant is Gérard ANTOINE, who is entrusted with the technical management and in

charge of the workshop and, since 1998, they have employed a head of quality control. The company is undergoing the final stages of certification to ISO 9000.

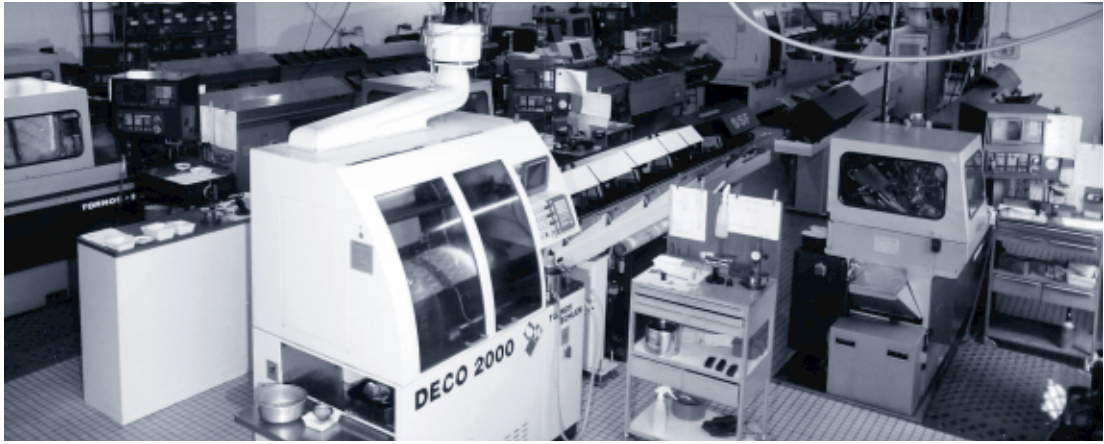
## Fleet of machinery installed

Nowadays, the COULOT company is a «pure small parts turning company», as is witnessed by its fleet of machines:

- ◆ 1990: purchase of an ENC-164 and a second ENC-162
- ◆ 1991: purchase of an ENC-164
- ◆ 1994: purchase of an ENC-162
- ◆ 1997: purchase of a DECO-10
- ◆ 1998: purchase of a DECO-10
- ◆ 1999: purchase of a DECO-20, purchase of a DECO-13.

In addition to the TORNOS-BECHLER fleet, the COULOT company also has a lathe with couter headstock, with 7 mm bar capacity, a high-precision reworking lathe with axis C, a three-dimensional contactless, measuring machine with video, and an assortment of small machines.





### Production

The company has a surface area of 700m<sup>2</sup>. To date it employs 21 people and achieves a turnover of 12 million francs. Its activities are divided up as follows: 50 to 60% of activities for the medical sector, 25% for aerospace, 10 to 15% for the connector industry and various high-precision parts.

Its strong points are quality and delivery time, which have been reinforced by the delivery periods for the DECO-2000, which are considerably shorter than was the case for the old generation lathes. This meant that the COULOT company was quickly able to adjust its fleet of machines based on orders. Being a leader in its own market and operating very short delivery periods, its fleet of machines and high-performance organisation enabled this company to meet the demands of its clients almost as «soon as the letter had been read». In this case, customer satisfaction regarding delivery time and quality is rule number 1 for the COULOT company.

The COULOT company specialises particularly in difficult materials: TA6V titanium, 316L stainless steel etc. To this end, the company employs qualified professionals, the majority of whom were trained in-house, since Mr. COULOT could not find the proper qualified staff in the labour market.

With its ENC-16 range, TORNOS-BECHLER enabled the COULOT company to operate with a considerable degree of versatility for small series runs, whilst maintaining precision in the quality of parts. All parts are less than 5/100ths. With an average of three series changes per day, this means that Mr. COULOT occupies an important place in the medical turning sector.

### Why the DECO-2000?

At the outset, the DECO-2000 was essentially purchased for machining connectors. In fact, it transpired that the competitiveness of parts produced on conventional NC machines was very limited. With its increase in production time from 30 to 50%, the DECO-2000 made it possible to become competitive again in this market.

With respect to the increase in the medical market for the company, Mr. COULOT shifted some of the production of parts to the DECO-2000. This meant that he could achieve a 50% reduction in production time, whilst attaining an improvement in quality and producing ever more complex parts.

Mr. ANTOINE, technical manager, discovered a precious tool in the TB-DECO. In fact, programming on a PC running in Windows led

to simplification at programming level, whilst the graphic environment and ease of synchronising operations, make it very convenient to use. The system, with its collision tests, ensures optimum work preparation, whilst considerably reducing machine downtimes when changing series. This system can work on databases (tool files, test programs etc.) and also stores the knowledge gained by the company.

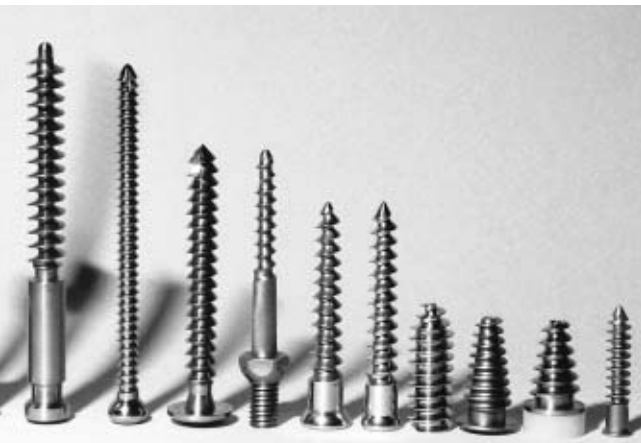
### Conclusion

The COULOT company will soon benefit from delivery of the DECO/2000-13 mm capacity, which it ordered, together with the TB-DECO version 5, which will further improve programming, and operating convenience compared with the current version installed.

As can be seen, TORNOS-BECHLER is an important partner. In fact, Mr. COULOT chose TORNOS-BECHLER at the outset because of its excellent reputation and because the TORNOS-BECHLER name has brought in new clients. What is more, in TORNOS-BECHLER he found an available partner, providing him with technical solutions and adapted machines, which were developed according to the latest requirements.

The partnership with TORNOS TECHNOLOGIES FRANCE is proving to be increasingly productive and Mr. COULOT appreciates the efficiency, quality and availability of TORNOS after-sales service.

*Raymond Paget  
Head of Sales TTF*



# DECO 2000: *A real alternative to cam-operated machines?*



**Three years ago we launched a catalogue « dedicated to owners who believed that their cam-operated machines were irreplaceable ». The aim of this document was to show our commitment in actually replacing cam-operated lathes with DECO 2000 technology.**

**A** replacement charter, outlining all those aspects we feel important, such as precision, productivity, overall space requirement, flexibility, reliability and even prices, was drawn up. The power of the DECO 2000 concept was then added to these points.

**But** were we right? Is it really possible to proceed with a complete change of production by replacing cam-operated lathes with the DECO?

**Mr.** Alain Tappaz, director of Tornos-Technologies France, recently told us that one of his clients had indeed taken the step and replaced his entire fleet of AR 10s with the DECO 2000, 7 mm ca-

capacity. A godsend like this was something our journalist could not ignore. A meeting was immediately arranged with the Hugard Company in Magland to discover the effects of this changeover.

**It** was on the 7th January last that our reporter travelled to Tornos-Technologies France, and then on to the small town of Magland, roughly fifty kilometres from Geneva, to meet Messrs. Robert and Maurice Hugard, CEO and general manager of the Hugard company.

**The** scene is set as soon as you arrive at the company, with its certificates of excellence and quality displayed on the walls, and

a feeling of high technology. We arrived at a company that was at the forefront of progress...

**After** a warm welcome, Mr. Robert Hugard showed us the company on a minuscule portable computer of the latest generation. The company has been in existence since 1971 and is actively involved in high precision small parts turning. What does the company specialise in? The production of components for coaxial connectors. The parts are complex, have small dimensions and multiple slits or folds. In most cases, they also undergo partial or complete heat treatment. This French company exports more than 99% of its production, of which 87% is to the USA.

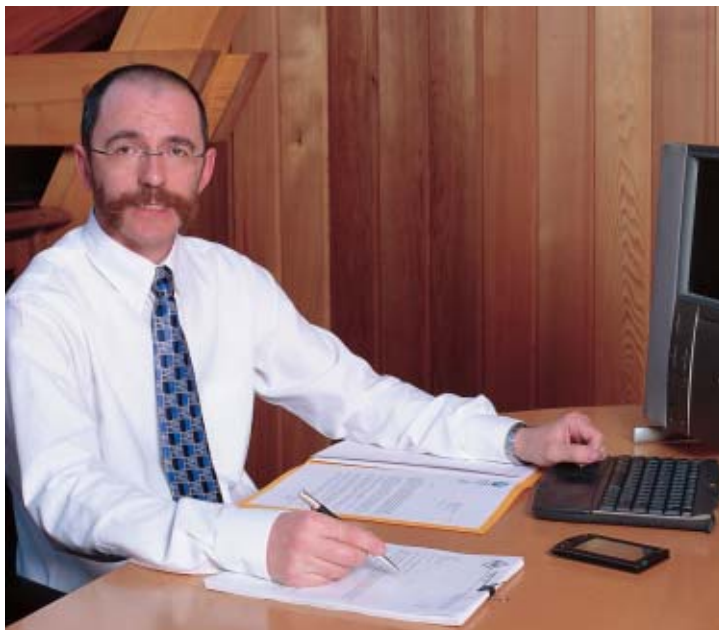
**In** 1992, the company had 17 AR 10s and achieved a turnover of 11 Million French francs. It now uses 17 DECO 2000s and achieves a turnover of 40 million FF!

**These** figures alone justify the complete replacement of the fleet of machines.

**Not** sure what you mean?

**A** visit to the shop floor, where 27 people were involved in production and no less than 7 in quality, is equally edifying. All the machine setters have their own portable PCs, which are linked in to the central PC in which the database for calculations are stored. At the inspection stage, each operator has an iBook, which is also connected to the central computer without cables.

**The** DECO 2000 concept was put at the forefront in this company, which is totally geared towards the future. All personnel were involved in the replacement of the cam-operated machines right at the outset of the project. The com-



Robert Hugard

pany's training and culture are so deeply-rooted that operators still working on the cam-operated machines wanted to speed up the change so that they too, could work with the new method.

Nowadays, each machine is fitted with a suction unit for oil mist and the air-conditioned shop floors have soundproof insulated ceilings. Work comfort and the individual value of colleagues have been greatly enhanced.

In addition to the pressure exerted by some of the staff wanting to change, Messrs. Hugard outlined the main reasons for proceeding with such a change in their production:

- ◆ 100% programming in masked time by the «calculation» module.
- ◆ Machine which can execute highly complicated parts more easily.
- ◆ Very fast setting times on the DECO 2000.
- ◆ Standardisation and universality of the machines, guaranteeing total flexibility in the workshop.
- ◆ High degree of reliability allowing for actual, just-in-time logistics.
- ◆ Production is as good as, if not better, than with the best cam-operated machines.

- ◆ Suitable interface and maximum working comfort.
- ◆ Capital tied up in cams and specific spares is reduced.
- ◆ Compliant with European CE/CEM safety standards.
- ◆ Workforce motivation through new technology.



Mr. Robert Hugard also raised the point of the vast simplification of material logistics (storage and cam follow-through) and information logistics, with all the necessary machining and customer data being compiled in programs.

Over the last three years, approximately 600 programs were

created by the company's specialists. These are stored on hard discs and obviously saved on an external medium, with very limited volumes... unlike the 1200 litres (6 full drums) of cams evacuated with the last cam-operated machine...

Since the scale of series machining already starts with 1000 parts, we were interested to find out about the profitability aspect for the Hugard Company. So that small quantities would be profitable, Hugard has a vast number of tools, which are pre-set and pre-adjusted in masked time. The machine is only stopped for the time needed to insert the new tools and to load the new program, to the point where, on average, the DECO-2000 machines at Hugard are running for approximately 8000 hours per annum! When the interview was carried out, the first DECO – introduced November 1996 – already displayed 24675 hours on its counter.

Apart from the optimisation and maximum utilisation of the DECO 2000 concept, Hugard adopted

the means to meet all the challenges of its markets, in supplying a complete machining solution under one roof, i.e. reworking, such as polishing, chucking, heat treatment, 90% of production undergoes hardening and part softening. Inspection, which is essentially carried out using Nikon





binoculars, is directly entered in the notebooks, which supply the company management system in real time.

The entire production process is followed through in real time, without any wiring, thus giving the company a particularly futuristic look. It is quite conceivable that in future, it will be possible to proceed with remote production follow-through, so that the customer can see exactly how things stand with the series parts: service in real time – a dream for all those in marketing!

The main essence of the Hugar Company is time and clearly everything has been done to achieve the maximum possible savings.

When asked about their vision for the future, the Hugar brothers firmly believe that real-time information and the ability to communicate information are the vital criteria of success.

Regarding the development of the DECO 2000, our journalists were surprised not to have to listen to grievances of a mechanical nature, but rather have it suggested that

there should be some computer-technology changes, such as «extracting statistical information from the machines», possibility to run TB-DECO under other platforms (Mac, Linux...), an even more user-friendly interface, machine communication ability, etc.

Reviewing all the aspects of our charter for replacing the cam-operated machines (shown in the frame below), we find that our argument was completely pertinent and reasonable. Three years ago we would never have dared to discuss the feasibility of a complete changeover from a cam-operated machine workshop, with an oil-laden atmosphere and deafening noise, to a soundproof and very clean workshop, with each operator having a portable PC connected to a central computer, without wires and cabling, and where the machines were fully enclosed and running with very little noise...

To conclude, we would like to thank Messrs. Hugar for their warm welcome and their frankness, and to wish them all the success in their future developments.

*Together, let us face the challenges of the future!*

#### **Charter for replacing cam-operated machines**

1. *TORNOS-BECHLER is working to replace the cam-operated machines that are coming to the end of their useful life, by offering a solution, which is just as efficient, if not better.*
2. *The rates of production calculated are similar and frequently even better than those achieved with cam-operated lathes.*
3. *The precision of the new solution is at least equal to that of the cam-operated lathes.*
4. *The new solutions provide a degree of flexibility unknown in the world of cam-operated machines and are in line with the general trend to reducing series runs.*
5. *The prices are worked out almost exactly, so as to enable the largest number of users to benefit from the new solutions.*
6. *The overall dimensions of the machine are identical*
7. *The reliability of the new alternatives means that groups of machines can run for 24 hours without any drawbacks*
8. *The use and programming were designed, based on the experience gained with cam-operated machines.*
9. *All the resources of modern technology are used to guarantee the durability of the solutions proposed.*
10. *Faithful to its company role, TORNOS-BECHLER proposes solutions likely to stimulate increased interest in the small parts turning profession amongst the young.*

# MULTIDECO 20/8: And three MULTIDECO machines!

The TORNOS-BECHLER product range is always being developed in order to meet customer requirements in the most targeted ways. Today, the company is proud to present its 8-spindle lathe incorporating the DECO 2000 concept.



The DECO 2000 concept applied to an 8-spindle lathe: the ease of programming coupled with the absolute power of an 8-station multispindle unit, now opens up all production options, ranging from the highly complex to the most demanding in terms of quality and precision.

Eight spindles provide more positions, more operations and the facility to complete all types of parts in a good quality finish. This ultimately means that TORNOS-BECHLER can now offer a lathe capable of executing parts which could not be machined with such versatility.

### Technical characteristics

Bar size:	20 mm
Part length without counter-spindle:	100 mm
Part length with counter-spindle:	80 mm
Max. spindle speed:	5000 rpm
Number of numeric axes:	23
Spindle stop:	yes
Number of cross slides:	3
Max. cross slides:	5
Counter-operation slides:	1
End units:	7
Number of counter-spindles:	1
Control management:	PNC Deco
Locking mechanism:	Hirth teeth

The mechanical part of the lathe, based on elements that have already been tried and tested on the MULTIDECO 20/6 & 26/6 (Hirth teeth, three roller bearings and base made from mineral cast iron) coupled with the vast experience in conventional multispindle lathes (SAS and BS), has been ideally completed by the hybrid concept of the MULTIDECO 20/6 & 26/6, namely: a camshaft to guarantee the minimum of downtimes, as well as the power of the PNC-DECO.

Compared with a MULTIDECO 20/6, the MULTIDECO 20/8 has two additional stations, thus allowing for the machining of

highly complex parts (transverse operations on additional stations, for example) and the highest levels of finish (roughing work and finishing on 2 stations).

This new multispindle addition to the DECO 2000 concept is officially presented at the SIMODEC 2000 in La Roche sur Foron (14th-18th March) and then, so that you can discover the machine's potential, we shall be presenting it in England (MACH), Germany (METAV, AMB), Italy (BIMU), Spain (MAQUITEC) and in the United States (IMTS).

This new machine is obviously controlled by the TB-Deco, a single software system to program the entire DECO 2000 and MULTIDECO fleet of machinery, which is your guarantee of a solution which can easily be mastered by your operators whilst providing total integration.

The MULTIDECO 20/8 is an excellent and profitable production tool, given its ability to increase the number of parts that can be machined, both in terms of quality and high degree of complexity, given its unrivalled changes in setting compared with conventional technologies and given its entirely forward-looking concept.

Come and discover the MULTIDECO 20/8 wherever you are in the world.