

# DECO MAGAZINE

3  
97



NUMERIC MULTI-SPINDLE – LATEST VERSION

E



**SOMMAIRE**  
**INHALT**  
**CONTENTS**

**EDITORIAL**

Etre plus proches de nos clients **3**

**ASTUCES**

Simplifions nous la vie  
Nous inaugurons par cet article un nouveau style de rubrique. Nous ne vous proposons pas uniquement un article informatif purement théorique, mais également du concret, utilisable de suite **4**



**INTERVIEW**

Usinages plus complexes et convivialité accrue  
Rencontre avec le dirigeant d'une entreprise française de décolletage **6**

**FORUM**

Au service des clients  
Entretien avec le responsable du service après vente **9**

**ACTUEL**

Expositions 98  
Vitrine de l'entreprise **12**

**TECHNIQUE**

Multibroche numérique, du nouveau  
Une nouvelle version MULTIDECO voit le jour **14**

**BRÈVES**

**16**

**EDITORIAL**

Deco steht für neue Drehteilefertigung **17**

**TRICKS UND KNIFFE**

Machen wir uns die Arbeit leichter  
Mit diesem Artikel weihen wir eine neue Rubrik ein. Dabei setzen wir Ihnen nicht nur Informationen und graue Theorie vor, sondern bieten konkrete, sofort anwendungsfähige Tips **18**

**INTERVIEW**

Gespräch mit Herrn Jean-Paul Burnier, Leiter der Firma MGB  
MGB war das erste französische Unternehmen, das ab Juli 1996 auf die DECO 2000 umgerüstet hat **20**

**FORUM**

Im Dienste der Kunden  
Unterredung mit einem Verantwortlichen des Kundendienstes **23**

**AKTUELL**

Ausstellungen 1998  
Tornos-Bechler-Schau fenster **26**



**TECHNIK**

Neuheit: Numerischer Mehrspindler  
Eine neue Version des MULTIDECO erblickt das Tageslicht **28**

**KURZ UND BÜNDIG**

**30**

**EDITORIAL**

The Deco Revolution Continues **31**

**TIPS**

Making life easier  
A new type of heading is introduced. In this article, we are launching a new subsection. We are not only offering you an informative articles but also something concrete which can be used at a later date **32**

**INTERVIEW**

With Mr Jean-Paul Burnier, director of MGB  
MGB works around the clock in the connector sector **34**

**FORUM**

The Customer is in the heart of the company  
Discussion with the head of after-sales. This department also proposes assistance and help in operating the automatic lathes **37**

**NEWS ... IN BRIEF**

**40**

**REVIEW**

Trade fairs 98  
The company's showcase **40**

**TECHNICAL**

The new MULTIDECO version has been introduced **42**

# The Deco Revolution Continues



It was only February 28th 1996 that the DECO 2000 concept was launched. It just seems to have been longer due to the massive effect it has had on the small turned parts market, on TORNOS-BECHLER, Moutier and on the TORNOS Technologies companies around the world.

Since then the DECO family has increased. Initially, it was the 7 mm bar capacity machine which was launched with 5, 7 or 9 axes. That was quickly followed by a 10 mm machine and then in September at EMO, a 20 mm variant was introduced giving 5, 7, 8 or 10 axes capabilities.

If that wasn't enough, the TORNOS-BECHLER DECO facilities of PNC have now been expanded onto the MULTIDECO.

This is a 26 mm 6 spindle machine giving from 13 to 17 PNC axes working in parallel.

This wasn't developed to make the multispindle faster, but to ease the problems of changeover and set-up. Said one user of both TORNOS SAS16.6 and DECO 2000 machines *"life is made very much easier". Engineers have thought about what is required. If a machine operation happens every cycle without alteration, it has been made cam actuation. If you are likely to want to change the stroke, feed, or even direction of movement, it has been made PNC."*

The DECO machine facilities have greatly affected the small parts manufacture. In the words of David Norman of Alphatool, *"The DECO has almost become the industry standard. We bought the first DECO 7mm in the UK. This was followed by a second machine, a 10mm machine and now we have a 20mm on order"*.

TORNOS-BECHLER has changed considerably because the DECO sales are increasing which means that production efficiency also needs to be increased. This has been assisted by a full revision of

ordering and batch assembly techniques. The modular design has meant that assembly instructions can be made late in the build programme, offering even more flexibility.

TORNOS Technologies operations around the world have also had to adapt to the DECO concept. This is largely due to increased numbers of machines which has necessitated more programme and operator training courses.

The DECO 7 mm/10 mm machines revolutionised the connector and related industries; the DECO 20 has already made great inroads into the subcontract market. The MULTIDECO from being launched at EMO has already received rapturous praise and the first orders have been received.

*What is next in the DECO revolution?*

*David Wilcock*

David Wilcock

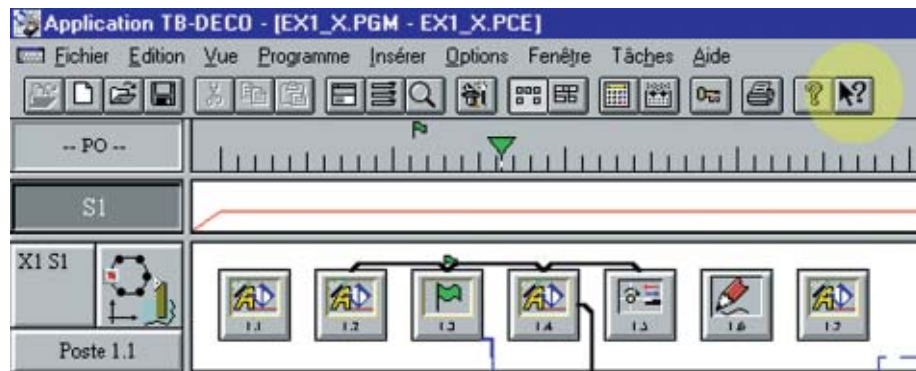
*A new type of heading is introduced*

## *Making life easier*

**By way of this article, we are launching a new subsection. We are not only offering you an informative articles but also something concrete which can be used at a later date.**

**T**his highly pragmatic information and the tips we shall be unfolding here and in our future issues will enable all DECO 2000 users to make better use of their investment. This will take the form of increased productivity and simplified programs, as well as other methods.

**The TB-DECO software** developed for the family of DECO 2000 lathes offers a multitude of unequalled functions and operations, which tends to grow with each new series. The specialist engineers at Moutier who are entrusted with development and industry application, refine processes, resolve minor complications and vie with ingenuity with one single aim in mind – that of success, especially that associated with the execution and machining of highly complex shaped parts. Parts, which could never have been executed on conventional numerically controlled machines. What would be more logical than sharing their discoveries and experience with all the users? This is why we are launching this new heading under the banner of “*Tips*”.



**We** met Stéphane Carozza. This specialist engineer, who is in charge of testing the DECO 2000, 20 mm, is the ideal person to

divulge his first two tips. The first of these explains the steps to be taken to get out of a sticky situation.

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**First tip:**  
*Using the integrated assistance*

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**Less** than a decade ago, every machine tool was accompanied by a mass of catalogues, methods of use, operating instructions and so on... Nowadays, this back-up is incorporated into the software. What is more, its volume has been reduced considerably because the mechanical part of the machine has been reduced to its very basics.

Concepts such as ‘electronics’ and ‘programming’ have gained in importance. Consequently, the need for assistance has dropped quite considerably since a large part of the electronic and computerised functions comprise tests and fail-safe devices which have been designed by the design engineer and prevent collision, for example.



## Second tip: Quicker programming

On-line screen help with TB-DECO software is divided up into four different sections:

- ◆ help with handling the TB-DECO
- ◆ help with basic programming
- ◆ help with programming for a specific machine
- ◆ help with errors generated by the TB-DECO.

As with all software working in Windows, help can either be called up directly by pressing the special function key [F1] or by way of the icon which can be selected and placed at the point where help is required.

The aim of on-line TB-Deco assistance is to provide a rapid response to the problem encountered in the programming or use of the TB-Deco, without having to delve into the printed operating instructions manual.

### First example

Requesting help when writing a G or M code immediately after the operation.

Proceed as follows:

1. key in the code in question (e.g. G84)
2. press [F1]
3. help text relating to the code keyed in is displayed; in this case, the programming aid describing the G84 function.

### Second example

An error message appears during interpretation of a program. Since this message is not detailed enough, you require more information.

Proceed as follows:

1. press [F1]
2. the error aid is displayed and provides a full explanation of the problem.

**Other option:** from the Exit window, use the mouse to get onto the line containing the error and then press [F1].

This particular programming will save you time by anticipating the reactions of the slow elements such as actuators.

You will surely have noticed that the "M" type functions programmed with an axis movement are executed at the time of axes translation. To illustrate this case, let us take as an example the advance of a manipulator arm (function M160).

The programming line is written as:

```
G1 G100 X1=3 Z1 = -10 F0.03
M160
```

Here, function M160 will take place whilst axes X1 and Z1 are moving and in certain instances, could jeopardise production.



In order to gain in productivity, it is possible to take account of the slow reaction of an item, in this case a pneumatic piston controlled by the M160 function.

Here is the solution to this problem: A parameter "D" followed by the digital code of the M function should be added to the end of the M code so as to specify an anticipation time in [ms].

In our example, the modified programming line is written as follows:

```
G1 G100 X1=3 Z1 = -10 F0.03
M160 D 160 = 1000
```

The same ISO code adopted above takes account of the reaction time of the element controlled by M160 as being 1000 ms, i.e. 1 second. In this case, the part manipulator will be in position as soon as the axes X1 and Z1 start to move.

The list of functions which can be controlled by anticipation is located in the programming aid, under the heading "Machine functions (M code)", Ant. column.

### Let us share our joint knowledge

The editing team sincerely hopes that this heading will help you to optimise your production runs. If you wish, we can deal with one of your specific problems. Do not hesitate to contact us ... there is bound to be a solution and it is possible that our experts have already come across it....

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What we  
can look  
forward to  
next

In the next issue of DECO Magazine, we shall deal with the subject of positioning the tool correctors for turning several ranges using the same tool.

# *More complex machining operations and increased user's friendly system*

MGB, which is located in Marnaz (Haute-Savoie) at the heart of the small parts turning valley, employs 75 staff and achieves a turnover of 70 million French francs, of which 80 % is for export – mainly to the USA.



**U**nder the direction of M. Jean-Paul Burnier, MGB works around the clock in the connector sector. The plant produces high-value complex parts having a diameter of less than 10 mm, made from brass, copper, bronze or stainless steel with average batch runs ranging from 500 to 50,000 parts. 70% of this production capacity is used for coaxial connectors and 20% for optical fibres. MGB was also the first French company to purchase the 7 mm Deco 2000 for its plant in July 1996.

*Deco Mag: What made you decide to equip your plant with the DECO 2000?*

**Jean-Paul Burnier:** In the telecommunications market one must react quickly and be flexible. Our policy to invest in the DECO 2000 shows that we are implementing this strategy.

**I**n fact, even with our entire TORNOS MS7 fleet of machines, we find that we still do not have the production capacity to enable us to manufacture all the contacts in a single operation. With the new DECO 2000 we can now quickly supply highly machined parts without additional finishing work.

*Deco Mag: What benefits would you gain from such investments?*

**Jean-Paul Burnier:** With the DECO 2000 it is easier to combine quoting, delivery and production.

What is more, the DECO 2000 makes production changes easier. It has opened up new markets and we can now offer new types of connectors with exceptionally small diameters and provide our clients with a new service.

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**Interview  
with  
Jean-Paul  
Burnier,  
MGB**

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*Deco Mag: Did the DECO 2000 match your expectations at production level?*

**Jean-Paul Burnier:** The design of these machines means that a large number of tools (i.e. 17) can be used, which allowed us to develop our own tooling and proceed towards machining more and more complex parts.

In this respect, one can say that the DECO 2000 range really meets the users' requirements. Besides which, the user-friendly computer interface is also an essential and positive aspect.

*Deco Mag: How did you manage the introduction of the DECO 2000 into your factory?*

**Jean-Paul Burnier:** Here at MGB, we first tried to optimise the cycle times before the setting times. We opted for this solution because we work on part families. This approach has proved ideal in optimising our production ranges. To achieve this, we reinforced our Applications Department and a production engineer has been specifically assigned to this task.

*Deco Mag: What training policy have you set up to go hand-in-hand with the commissioning of the DECO 2000?*

**Jean-Paul Burnier:** We sent some staff to Moutier for training. These included a small parts turning setter and a small parts turning operator working on the MS 7 cam machines, both already experienced in computerised cam calculation and in numerical control on the Top 100, ENC 74, ENC 164 and 264 machines.

These staff combined cam experience on the one hand with a technical qualification package on the other. This combination achieved in perfect teams and the results were successful.

We are currently training a new group of 4 people with the emphasis on training the setters. Some of this training is conducted in-house.

*Deco Mag: What is your final analysis of the DECO 2000?*

**Jean-Paul Burnier:** We now have very good experience with the 7 mm DECO 2000. However, the development of our activities towards highly complex parts has now resulted in our ordering 8 further DECO 2000 machines for the beginning of 1998, with 4 of these being 10 axes, 20 mm machines. Obviously, we cannot compare the periods of depreciation of an MS7 with a DECO 2000 but we can only view using the DECO machine for the future.

« **The future of high precision turning can hardly be considered without DECO 2000** »



# The Customer is in the head of the company

Many companies would like to dispense with the After Sales Department because it frequently has a negative connotation. However, this is hardly the case at Tornos-Bechler. This department not only has the task of looking after its clients, but also proposes assistance and help in operating the automatic lathes.

*Discussion with the head of after-sales*

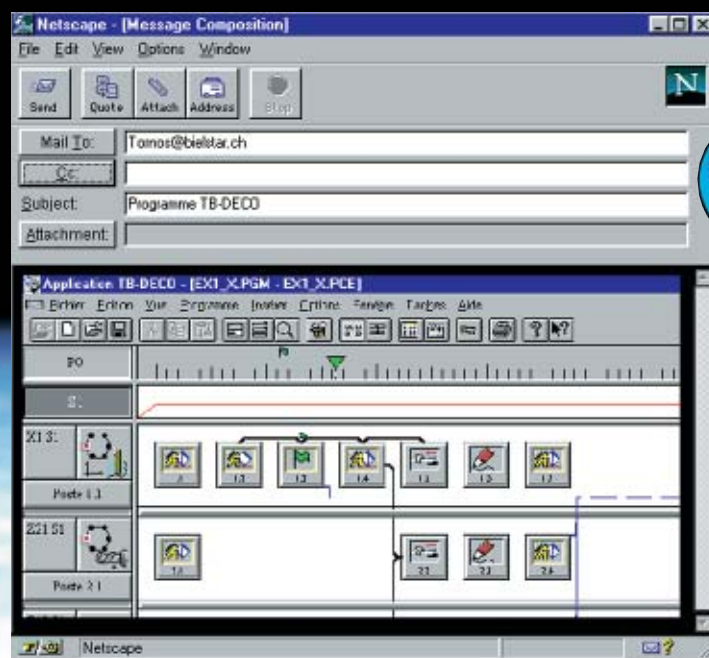
From February 1996 to December 1997 – i.e. for almost two years – the DECO 2000 has been reigning supreme in combining flexibility with productivity. This is a sufficiently long time for us now to look at the After Sales Department. We arranged a meeting with Monsieur De Maeyer, head of World After Sales at Tornos-Bechler. Following a warm welcome, we very quickly got down to the heart of the matter.

*Deco Mag: Mr. de Maeyer, what do you think of the negatives arguments of some competitors concerning the design using on the DECO 2000 – for all capacities?*

*M. de Maeyer:* The DECO 2000 is a revolutionary product based on a new concept, new software on tried and tested equipment. Regarding the equipment, we opted for the well known Fanuc control. However, the internal operation of this control is different for the DECO family. We have chosen

this make because of its complete reliability. What is more, Fanuc is widely distributed in the world of machine tools. As regards the mechanical side, we have adopted and upgraded the mechanics from previous machines.

We particularly listen to our customers and follow up all possible suggestions for improvement. All justified comments are immediately processed, examined and analysed and, if expedient, a correction is made.



E



Our success – in other words the 250 machines delivered to our customers – has forced us to react very swiftly and incorporate production solutions almost instantaneously!

*Deco Mag: And the machines already supplied, is there any form of service control?*

**M. de Maeyer:** A preventive maintenance programme, is provided to our customers.

In the event of a problem which could entail a risk of production shut-down, the TORNOS-BECHLER After-Sales Department will propose a preventive solution. Hence we have never had to shut down production of the DECO 2000 for more than 24 hours.

*Deco Mag: You are talking about problems, Does that mean that DECO is not good enough yet?*

**M. de Maeyer:** Not at all basically speaking, these are not product defects but rather problems linked with a shortcoming in training, incorrect use of the software or even a non-standard application requested by the clients.

Updating the operating software takes place systematically and as regards trouble-shooting for our clients, we are always very quick off the mark. Where we have to visit our clients, we update the software packages as a matter of course.

*Deco Mag: Therefore, as a client, I run the risk of having replacements or changes made without being made aware of these?*

**M. de Maeyer:** New developments are not incorporated into the machines without the customer's approval and his explicit request.

*Deco Mag: What happens if the client doesn't want any preventive modifications or improvements relating to the new software possibilities?*

**M. de Maeyer:** the customer may, of course, refuse this update at any time and his DECO 2000 machine will still be 100% operational. However, the After-Sales Department has never yet come across such a case! The clients always wish to have the latest improvements.

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**The  
DECO 2000  
is a  
remarkable  
improvement  
on the  
ENC**

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To help with programming the TB-DECO, we appointed M. Ozuna who acts as a consultant to our clients. He is responsible for sorting out and improving customer communications, especially via the Internet. He can speak five languages perfectly and is always available to the users.

*Deco Mag: What are the current problems experienced by the TORNOS-BECHLER After-Sales Department?*

**M. de Maeyer:** There are very few. We have a vast number of improvement projects corresponding to customer requirements for tomorrow's workpieces, new technological discoveries and even working groups studying the best possible services provided by the DECO 2000.

The After-Sales Department is also investigating the feasibility of improving customer assistance, assistance with programming and training and, of course, improving the machines by applying preventive solutions.

*Deco Mag: What is the After-Sales Department doing to meet these "future" requirements?*

**M. de Maeyer:** In view of the large scale of deliveries, we have employed a large number of extra engineers, both at the parent company and the subsidiaries, to deal with the mechanical and software aspects and hence to monitor the follow-up of the TB DECO machines.

*Deco Mag: Do you come across a lot of problems with the TB-DECO?*

**M. de Maeyer:** No, but we have to acknowledge that our clients do not have a lot of experience with PCs. It is quite possible that minor problems may occur when installing or using the machine. The lack of knowledge in data processing amongst some of our clients has led to numerous questions concerning the TB-DECO. We noticed that because of the TB-DECO, the complexity of parts which can be executed has risen dramatically, including synchronisation, fixed cycles, anticipation of certain functions and so on... such widespread demands require in-depth knowledge.

M. Ozuna is available to help the clients gain the maximum benefit from their machine. His training as an electronics engineer enabled him to co-ordinate the work of the different subsidiaries of the group so as to optimise client interfaces at information level, which will soon be standardised at worldwide level.

The requests for information will be centralised at Moutier and then regularly transmitted by country and client and by problem. This centralisation policy enabled us to pin-point identical problems for a given country, meaning that we can sort these out far more quickly.

*Deco Mag: Are there any intervention statistics, especially when comparing ENC machines?*

**M. de Maeyer:** The technical situation is well under control and even better mastered than for the

ENC families. The future lies with the DECO 2000 and one cannot leave technical problems unresolved. It goes without saying that the company is putting all its weight behind the DECO 2000. To date, the reliability of the DECO 2000 is better than of the ENCs, and the running improvements made to the former will far outstrip this rate of reliability

A number of clients felt rather concerned about the DECO 2000 and the improvements and solutions to the initial minor teething troubles were worked out with the co-operation of the customers. A lot of data and information exchange took place; the feedback was extraordinary. I would like to use this opportunity to thank those clients who have made a real contribution to the future of the DECO 2000 and who submitted themselves to the possible problems they were likely to encounter.

**Deco Mag:** *Is it possible to put a figure on the reliability of the machines?*

**M. de Maeyer:** Those DECO-2000 machines currently leaving the works with updates or improvements, have a reliability level somewhere between the ENC and SAS-16.6.

This is improving all the time and the criterion on which we are making this claim is the rate of machine availability which is fully automatically monitored by the computer and hence free from all kinds of misrepresentation.

The average rate of availability of the DECO 2000 in April 97 was 96.6% whilst today, this figure has risen to 98.13% because of significant improvements.

**Deco Mag:** *At maintenance level, what is the difference in cost between an ENC and a DECO 2000?*

**M. de Maeyer:** It goes without saying that the DECO 2000 is clearly less expensive than an ENC! Even if this were purely due to technological developments making it possible to reduce the cost

## The potential of the DECO 2000 range is huge

of numerical control units by 30%.

What is more, maintenance is simplified, the hydraulics system dispensed with, thus preventing oil pollution during cutting, and also the introduction of a simplified procedure for changing filters and maintenance tools (i.e. the battery) for control purposes, means that access is now easier.

**Deco Mag:** *We know that the DECO 2000 with its TB DECO and PNC Deco concept may disconcert some users. At After-Sales Service level, are there any statistics showing whether the old cam machine operators are less at ease than the users of conventional CNC machines?*

**M. de Maeyer:** No, not really. Quick familiarisation is highly effective both for the conventional users of cam machines and for CNC operators. We do not provide more assistance for one particular type of client than for another... which proves the conviviality of the machine and programming system. What is more, a DECO 2000 is far more easy to handle than an ENC 75, for example. It is not more difficult. It is different but also offers much more.

**Deco Mag:** *What methods of customer follow-up are used?*

**M. de Maeyer:** At After Sales level, customer follow-up takes place in different ways. The life of the machine can be traced back 100% – in other words, all intervention work, telephone assistance from

Switzerland, technical or software updates and so on are recorded accurately. We also operate a policy of personal client follow-up which enables us to personalise our assistance and updating work. Modern data processing systems allow us to contact the client again to see that the machine is running properly. Our department places great value on keeping the customer happy, even following intervention work. What we must absolutely avoid is leaving our customers dissatisfied without being aware of this.

## A closing anecdote

M. de Maeyer now told us of an anecdote which is quite revealing for the DECO 2000 and TORNOS-BECHLER which, because of their highly prestigious historical background, are held in high regard amongst small part turners:

*"An engineer who was recently taken on by the After Sales Department and who used to work for other machine builders, expressed his surprise at the fact that when carrying out service work on the DECO 2000, he was admitted by the front door of the companies and no longer had to enter via the back door".*

*We were very happy to hear this and are proud that our clients treat the DECO 2000 and TORNOS-BECHLER in this way.*

*To conclude, M. de Maeyer told us that he was pleased to be involved in the DECO 2000 adventure because this product is highly innovative, in more than one respect. The potential of this range is enormous and in future, the After-Sales Department will become the second sales force of TORNOS-BECHLER.*

**WELL COMMITTED PROCESS**

**C**ertification to the quality standard ISO 9000 is getting closer for TORNOS-BECHLER. At present, more than 50 % of the work has already been carried out... the certification audit is scheduled for next year.

**CORRECTION**

*Unfortunately an error has occurred on page 31 of our preceding edition:*

**T**he legend of the maximum kinematics of DECO 2000, 20 mm was indicated as 20 axes.

**A** bad insertion at the translation is responsible for this error. It should have read 10 axes.

**We** apologize for this mistake.

*The company's*



**1998 will be a year without... without what, are you saying? Without EMO of course!**

**Never mind, TORNOS-BECHLER is not going to wait patiently for the next EMO to display its latest innovations.**

**I**n fact, TORNOS-BECHLER and its subsidiaries are not resting on their laurels because the round of fairs will be starting at the dawn of the new year. The aim of these specialist fairs is to attract the maximum audience within the minimum amount of time. Some of these are regional and sectorial whilst the others are more general and world-wide - international trade fairs reach out to all industrialised countries.

*A world-wide show case*

**W**ith the aim of presenting the new DECO 2000 concept to as large a number of potential clients as possible, TB will be investing 80 % of its marketing budget in this vehicle of communication. At least 39 fairs will be presenting the DECO 2000 model and its new philosophy. From Europe to the USA, via the Asian continent and Australia, all the major international trade fairs will see these machines, which are easily recognisable by the famous blue diamond logo.

**T**he table clearly shows that no region will be neglected, which will be thanks to the company's promotional efforts. You will also see

*Deco-Magazine – in brief...*

**INTERNET**

**F**or some time now, in addition to its own site (tornos.ch), TORNOS-BECHLER now features in the Swisstechnology list

(<http://www.swisstechnology.ch>).

**T**his server, which is designed to list all those professionals involved in technological solutions, is an excellent showcase for Swiss know-how.

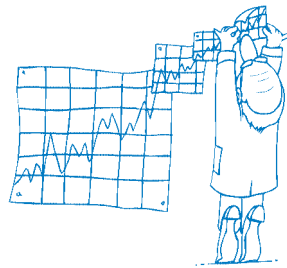


**BUILDING WORK CONTINUES**

**I**n June 1997 when the DECO 2000, 20 mm capacity was being launched, our visitors were given the opportunity to see the new company production shop. This shop has now been in operation for several months. Yet despite this, building work is still going on... a second building will soon be completely emptied and renovated. Having a surface area of 2000 m<sup>2</sup>, it will complete the new shop.

**SPLENDID SEPTEMBER**

**V**ery impressive results for the company. During the EMO fair at Hanover, more than 35 machines were sold on the stand – of which 90 % are benefiting from the DECO 2000 concept!



**ALMOST HOLLYWOOD**

**T**he video film of the DECO 2000, 20 mm capacity has now been released. With its surprising scenario in the world of machine tools, it explains the main benefits of the 20 mm DECO 2000.

**I**t is available in 5 languages in VHS, Pal, Secam, NTSC formats and can be obtained from your normal TORNOS-BECHLER contact.



showcase

DECO FAIRS 1998

that the entire year is well catered for. The details of these trade fairs are based on the information available at the time of publication. Depending on calendar and production requirements, it is quite possible that some changes will be made.

*A rich offer*

The types of machines presented at these exhibitions will, of course, be largely based on the DECO 2000 concept. Despite this emphasis, the innovations made to the SA 16.6 range will also be featured at some trade fairs.

Also next year, TORNOS-BECHLER will be concentrating more on the users and operators of automatic lathes and will seek them out in international markets.

*We'll see you anywhere in the world – just a few minutes away from you.*

Period	Exhibitions	Venue	Country	Dates
January	Nortec	Hamburg	G	20-24.01.98
February	Unitech	Padova	I	12-16.02.98
	TTD-Hausausstellung	Pforzheim	G	16-20.02.98
March	IHM	Munich	G	7-15.03.98
	Simodec	La Roche-sur-Foron	F	9-14.03.98
	Biemh	Bilbao	SP	9-14.03.98
	Techni-Show	Utrecht	NL	23-28.03.98
	Westec	Los Angeles	USA	23-26.03.98
	Linkage Industry Martini	Hong-Kong Brescia	CHINA I	27-30.03.98 28-31.03.98
April	Siber Hegner	Taipei	TAIWAN	April 98
	Simtos	Seoul	KOREA	22-27.04.98
	Mach' 98	Birmingham	UK	27.04-2.05.98
May	Tecnocontrol	Torino	I	4-9.05.98
	Fameta	Nuremberg	G	5-9.05.98
	Eurotech	Brussels	B	12-16.05.98
	Metal 98	Fredericia	DK	12-16.05.98
	Metaltech	Kuala-Lumpur	MALAYSIA	13-17.05.98
	Open House	Milano	I	18-23.05.98
	Agro Komplex	Nitra	CZ	19-22.05.98
	SIAMS AIEE98	Moutier Sydney	CH AUSTRALIA	26-30.05.98 26-29.05.98
June	JMP	Poznan	PL	15-19.06.98
	Metav	Düsseldorf	G	16-20.06.98
	Biam	Zagreb	CROATIA	9-12.06.98
July	Expo Interne	Granollers	SP	2-6.07.98
September	IMTS	Chicago	USA	9-16.09.98
	AMB	Stuttgart	G	15-19.09.98
	Brno	Brno	Czech.	14-19.9.98
October	Bimu	Milan	I	1-6.10.98
	Metal Working	Shanghai	CHINA	5-9.10.98
	Tek Mässa	Stockholm	S	6-10.10.98
	Jimtof	Osaka	JAPAN	28.10/4.11.98
November	Maquitec 98	Barcelona	SP	November 98
	Metalomecanica	Porto	P	November 98
	Indonesia	Djakarta	INDONESIA	18-22.11.98
	MetalAsia	Singapore	SINGAPORE	17-21.11.98
	Fawem	Basel	CH	24-28.11.98



*The new MULTIDECO version has been introduced*

# *Numeric multi-spindle – latest version*

**From the single spindle to multi-spindle – the DECO 2000 concept will soon cover the entire range of automatic lathes.**

**A**ll the professionals in small parts turning will have noticed that TORNOS-BECHLER has penetrated a new market. From now onwards, the DECO 2000 concept will not only be expressed in the singular, but also in the plural! The multi-spindle type DECO 2000 was presented to the public at the last EMO machine tools exhibition. This was the 13 axis MULTIDECO 26/6 lathe.

## *New numeric multi-spindle lathe*

**T**his new machine is intended to take on a prestigious position in the 26 mm capacity multi-spindle market. A new version is currently being prepared with the same aim in mind and will be unveiled at the Simodex 98 trade fair at Roche-sur-Foron in Haute Savoie (France). For readers of the Deco Magazine, we can already divulge that this is a 17 axis version.

*The numerous benefits provided by this lathe are as follows:*

### *Seventeen axes*

**T**he flexibility of using this lathe has been improved by four numeric slides. For example: thread cutting by tools no longer causes problems as is also true of machining complex parts requiring considerable swarf removal following external or internal turning.

### *Dual-speed spindles*

**T**he dual spindle speed is ideal for obtaining the best adapted cutting speed, especially during the long turning and forming operations at the various stations. This new function will also be appreciated by those users wishing to do thread cutting and polygon work.

### *Spindle locking*

**T**his new device offers the possibility of executing new functions during cross machining, such as drilling, boring, tapping etc.



### Counter-operation

With the separate counter-operating cutting slide, it is now possible to machine the rear of the part. The following operations are now possible along this particular surface:

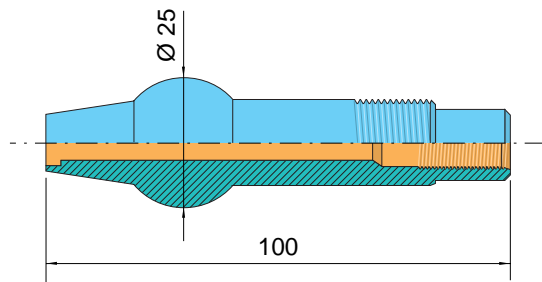
- ◆ *drilling - boring*
- ◆ *drilling - tapping*
- ◆ *drilling - stamping*
- ◆ *drilling - turning*
- ◆ *turning the cutting face*
- ◆ *turning a shape on the rear of the part*

### Peripherals

The bar feed associated with this new 17 axis version has also been upgraded by TB. Referred to as the MSF-826, this 3 m bar feed is placed directly behind the machine instead of the bar guide.

In addition, however, commercially available units are proposed for polygon, thread milling, rolling, stamping and rotary slitting operations, as well as for the high-frequency spindle.

This automatic lathe has an undeniable advantage: it's high versatility. It also allows rapid set ups changes and offers a far wider scope of machining.



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