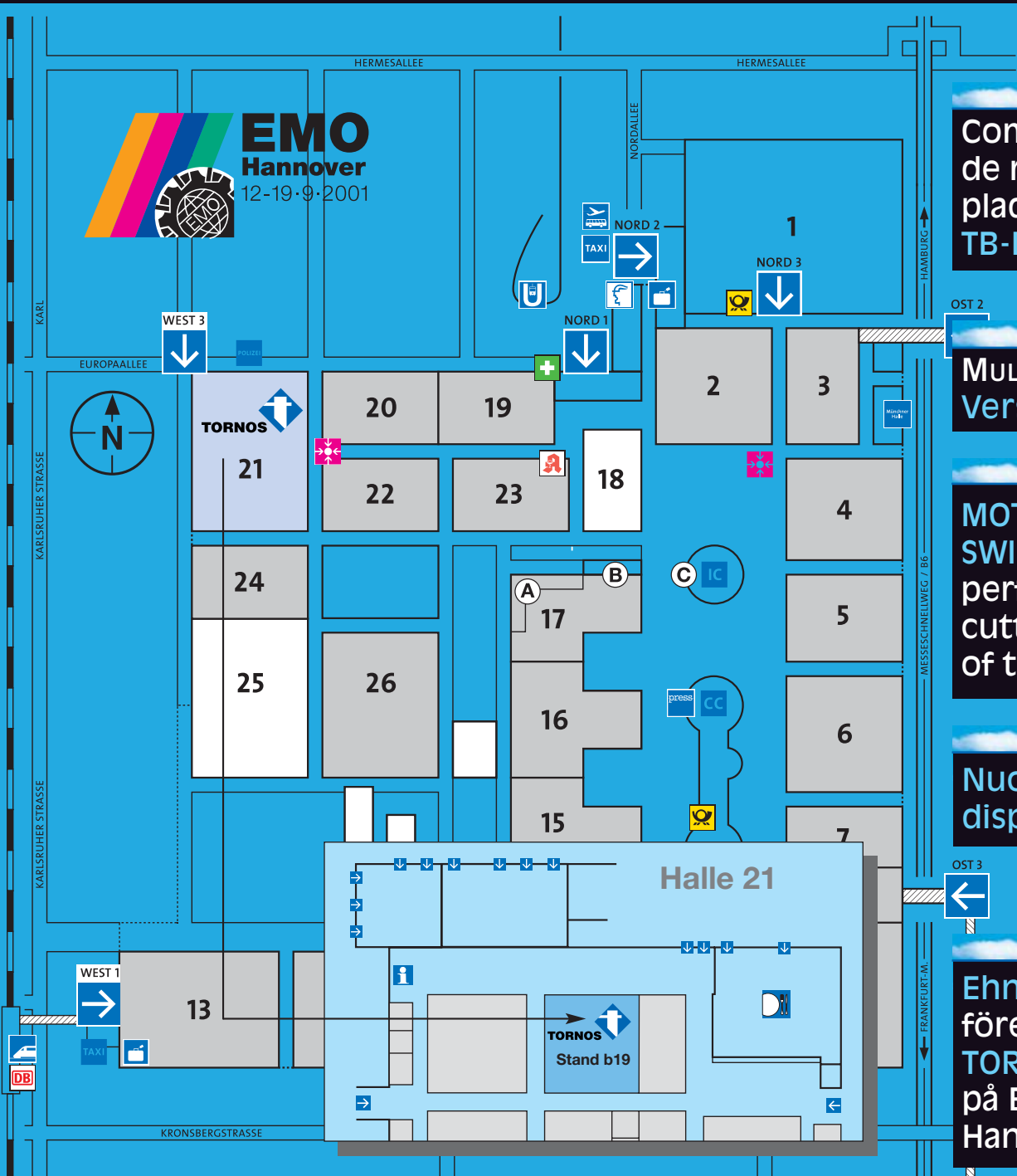


DECO MAGAZINE

18

3/01

SEPTEMBER



Compensation
de rayon de
plaquette dans
TB-DECO

MULTIDECO 20/8
Version 2X4

MOTOREX
SWISSCUT High-
performance
cutting oils
of the future

Nuovi
dispositivi...

Ehn & Land
förevisar
TORNOS-NYHETER
på EMO i
Hannover



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IMPRESSUM DECO-MAGAZINE 18 3/01

Industrial magazine dedicated
to turned parts:

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Welcome to the EMO in Hanover!

Welcome to TORNOS!



EMO
Hannover
12-19.9.2001

This important platform provides Tornos with the opportunity to demonstrate once again, its technological progress through its revolutionary DECO concept. Since it was first launched in 1996, this new turning technology for series-produced parts has always gone from strength to strength.

At present, three product ranges are running using to the DECO concept.

Following application of the DECO concept to single-spindle sliding head lathes and multispindle lathes, a third product range has now been appropriately fitted out. The first representative is the DECO 42f headstock machine. From now onwards, there are three different types of lathes operating running using the DECO principle.

This represents major potential for our clients involved in different small parts turning operations and considerably enhances programming, the incorporation of products of different technologies (single spindle sliding head, fixed head and multispindle) and service.

For those involved in the machine tool industry throughout the world, the EMO at Hanover is, without doubt, one of the events of the year 2001.

DECO 42f

High productivity, mainly provided by the facility of working with four tools on two spindles simultaneously.

The new DECO 42f is a lathe that has been designed to produce small to large batch parts, for diameters up to 42 mm and lengths up to 100 mm. It has two identical spindles, on which two tools can machine simultaneous operations (for example, rough-machining and finishing on both sides of the part). This automatic lathe has also demonstrated its flexibility in producing complex parts, since it is fitted with 12 linear CNC axes and 15 tool holders per spindle. 16 of the 30 tool holders can be fitted with rotating tools. The two spindles are fitted with a C axis. Apart from the speed, flexibility and productivity of the new DECO 42f, precision is also a feature, which must be highlighted.

Extending the DECO family

A second innovation to be presented at this exhibition relates to the PNC multispindle lathes. Up to now, this product range comprised the two automatic, 6 spindle 20/6 and 26/6 lathes and the 8 spindle 20/8 lathe. From now onwards, this series will be increased to the 32-mm capacity machine. The new MultiDECO 32/6 i with its incorporated bar feeder is a consequential development of the MultiDECO 26/6. Its design is based on the static and dynamic conditions of an automatic 32 mm lathe.

The spindles, drives, motors, controls and slide structures have been dimensioned in such a way as to allow the MultiDECO 32/6 i to be perfectly adapted to all operating requirements within these diameter ranges.

The main objective of the designers of this machine was to produce a machine that is a truly integrated and fully autonomous turning unit, with very high output coupled with reliability and precision.

Are you interested? Come and see us at our 500 m² stand in Hall 21, Stand b19. It will be a pleasure for us to show you our latest products. A refreshing drink will also be offered.



Michael Czudaj
Director of
TORNOS TECHNOLOGIES
Deutschland GmbH

HSK 32 tools for the **DECO 42f:**

A proven clamping technique...

Mapal has evolved a tooling concept that has now become a high-tech solution. A strong international presence, continuous innovation, customer-related services, qualified staff and a complete range form the bases of the highly successful MAPAL Group.



Absolute precision

Apart from its in-depth knowledge of drilling and milling tools, MAPAL is also providing innovative solutions with respect to clamping. The product range includes all types of tools, ranging from the standard to the most highly complex and specialist tooling.

Absolute precision forms the basis of MAPAL tools. This in turn leads to reliable tooling concepts, meaning that production is carried out according to a tried and tested procedure. The different MAPAL precision tool systems guarantee ultimate precision machining. The results are excellent surface finishes, good concentricity and straight turning, coupled with optimum production times.

Complete services

Apart from a large assortment of tools, MAPAL is also offering new services, such as the Tool Expert Team (TET) and Tool Management Services (TMS). TET is involved in the complete application of tooling so-

lutions for the part being produced, ranging from design to the composition of the tools, before the procedure is ultimately launched. TMS provides the Full Service with respect to production. This allows the client to concentrate on his own skills and on the precision of his top-quality products.

machining problems encountered by its customers. Subsidiaries in Germany, the USA, the United Kingdom, France, Italy, Japan, Brazil, Hungary, India, Taiwan, Korea and Switzerland provide a fast, local service. Their universal knowledge is completed by experts distributed throughout the world working in 35 service and consultancy offices.

A tried and tested clamping technique

MAPAL has been involved in developing the technique of modular tooling as far back as the late 80s. The standard cone (HSK) proved to be highly beneficial to the user both on account of its efficiency and its qualities of strength and precision. It is used tens of thousands of times throughout the



Throughout the world

MAPAL's main concerns are quality, close contact with clients and responding to the first signs of market trends and demands. Each day, more than 1,900 employees of the MAPAL Group develop new solutions, which can be applied to the

world together with MAPAL precision tools. Now it has become a standard.

In the early 90s, with the standard HSK now widely in use, MAPAL set about developing a complete clamping system.

The MAPAL clamping tool range comprises a large range of different adapters, rotating chucks and the "KS-clamping cartridge". This clamping cartridge forms the basis of HSK MAPAL clamping tools, which have already been tried and tested for many years now. This cartridge is fitted directly to the spindle or to a flanged adapter.

HSK on an automatic lathe

HSK clamps and tools are also perfectly adapted for use in automatic lathes.

MAPAL has specially created a series of adapters for this area of use and for the DECO 42f. Apart from the vast clamping power and transmission of the appropriate turning and bending moments, the exact positioning for automatic lathes represents a unique characteristic of MAPAL clamping units.

has been specially developed for the series of turning adapters.

In this way, the tool is positioned automatically and always faces the same side during assembly.

The special benefits of the cone/surface interface are also exploited when used with turning tools.



KS MAPAL clamping cartridge

Whilst the cone/surface interface provides maximum strength and accuracy, the bending and twisting capacity is determined by the clamping system. The large clamping stresses not only provide excellent cutting conditions, but also good static and dynamic stability for the finishing operations, even for very long tools.

This is how it is possible to achieve exceptional quality at highly competitive cost. The clamping cartridge is fitted by way of a bayonet connection and locked in position by a strong clamping bolt.

During clamping, two clamping jaws are directed outwards in a radial manner by way of a left-right screw. To do this, the clamping jaws adopt a 30° angle on the cone clamping shoulder thereby creating axial and radial clamping forces. During unclamping, an ejector pin ejects the tool from the pre-stressed connection.

The vast clamping power is the result of the specific and direct action of the clamping jaws during clamping. For a torque of 6 Nm, the MAPAL KS-clamping cartridge achieves a clamping power of 11 kN. This is 6.5 kN higher than the standard, which specifies 4kN – with a torsional moment of approx. 170 Nm. These values guarantee safe use.

The exact position is guaranteed by the "torsion rod principle", which

The standard HSK has already proved itself for turning tools and turning centers, not to mention the special machines and lathes.

Apart from technical advantages, the financial arguments are also decisive, seeing that we are dealing with a standard, open system. This standard allows for a large range of applications on lathes and turning / milling centers in a very beneficial way. This is undeniably the key to the company's success.



In a future issue, we shall discuss the tool programs of the various manufacturers that have adapted to the DECO 42f.

Announcing a new MULTIDECO...

Following the successful introduction of numeric control on an 8-spindle MULTIDECO 20/8 lathe, early in 2002, TORNOS will be introducing an innovation, which will be of particular interest to all those users wanting to increase their productivity.

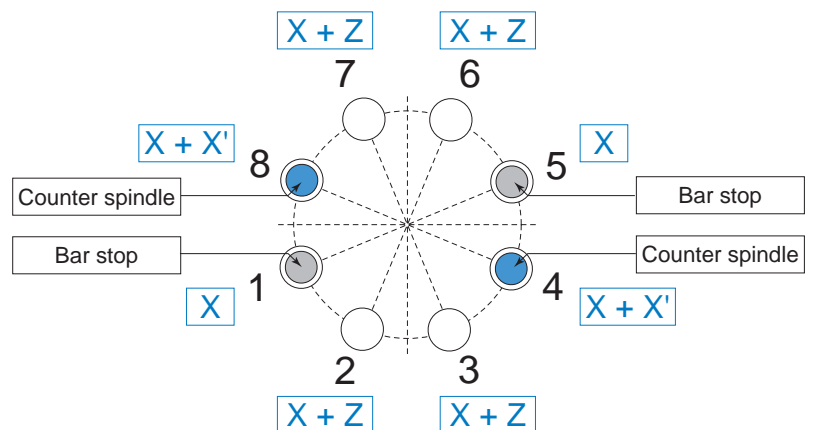
You will be given the opportunity of executing parts that only require a few machining operations in an authentic configuration using 2 parts per cycle, thanks to the MULTIDECO 20/8 [2x4]!

This new machine, which will be discussed in greater detail in a subsequent edition, will first be launched in Moutier in May 2002, before making its appearance at the various important trade fairs in 2002 (Metav, Amb and Bimu...).

The first deliveries of this real solution [2x4], incorporating specific peripherals (such as the bar feeder in particular), will start at the beginning of autumn 2002.

MULTIDECO 20/8 version 2X4

Perfect kinematic symmetry for this MULTIDECO [2x4] 20 mm capacity.



in the TB-DECO

A major function offered by the TB-DECO is the use of plate radius compensation in turning operations. The main advantage is being able to use standard tools commercially available on the market, especially from certain machining diameters upwards. However, some basic concepts are essential to understand the principle of use. This article serves to help you (re)discover this functionality.

1. The plate radius (R)

Let us consider the contour of part A-B for external turning:

- P1-P6:** points programmed in the ISO TB-DECO code (figs. 1 and 2)
- red dash:** form error (fig. 1)
- blue point:** theoretical tip of the tool (figs. 1 and 2)
- red points:** tangent points at segments (fig. 2)
- blue dashes:** path from the center of the plate radius (fig. 2)

In Fig. 1, the tool is positioned according to the points (P1 to P6) defined in the program, without any compensation. It can be seen that a form error (in red) appears at the P2-P3 path. In Fig. 2, the positioning of the tool no longer takes place at the theoretical tip but the system compensates the position by taking account of the plate radius. It places this last tangent at the path segments. In fact, the TB-DECO always takes account of the next segment in order to position the tool correctly at the time of active correction. Outside the compensated path, the software only considers the theoretical tool tip (point P1 and P6).

1a. The radius R must be input in the tool catalogue under the R field.

Fig. 1 Without compensation

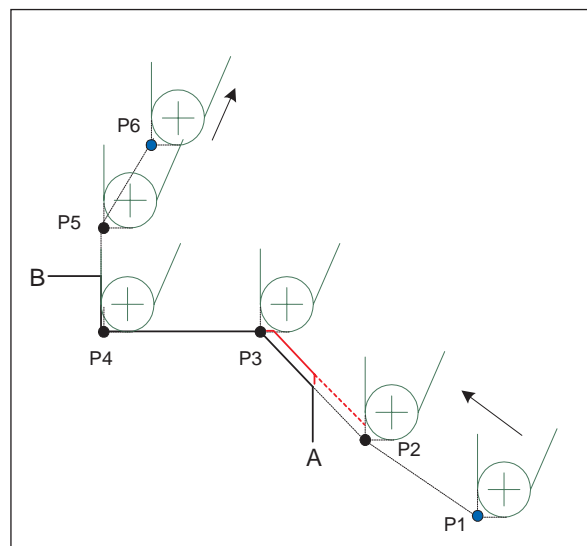
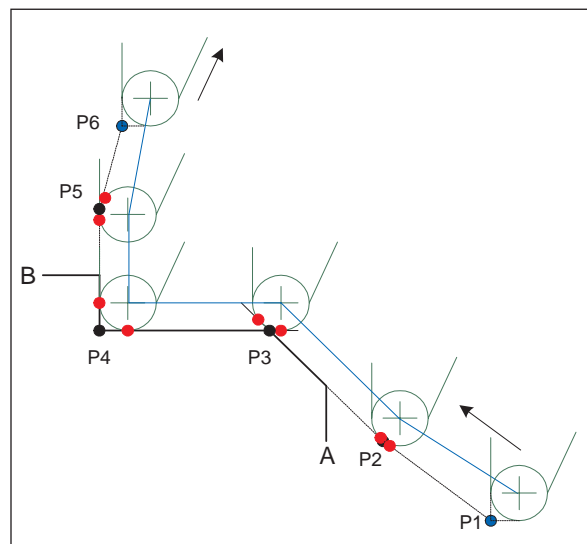


Fig. 2 With compensation



2. The dial (Q)

The system also needs to know the dial number, in other words, the plate sector(s) that will come into contact with the material. In order to define this dial correctly, the ISO drawing (Fig. 3) must be used as a reference. The origin of the right part and tool fitted to the positive dials with the tip at the bottom:

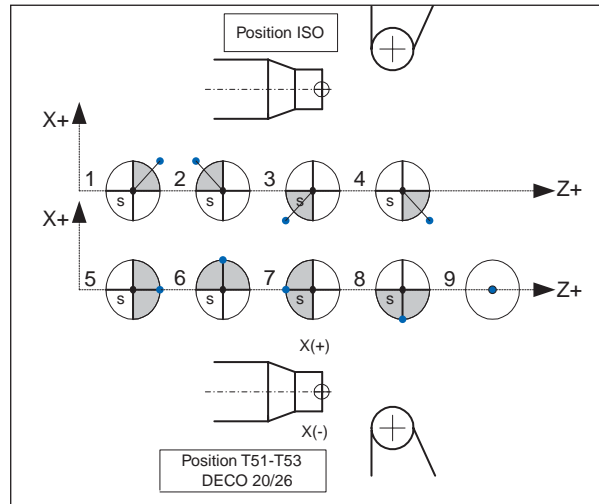


fig. 3

If we take, as an example, the above, external turning situation (Fig. 2) the defined dial is 3 (Q=3).

For counter-operations (DECO 20, T51-T53) the tool position and position of the part are the other way round – and this is the exception to the rule.

2a. The dial must be input in the tool catalogue under field Q.

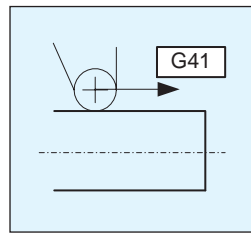


fig. 4

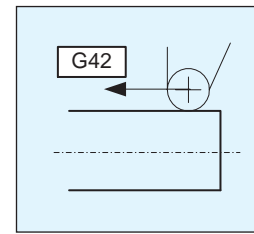


fig. 5

3. Point of approach / release

A very important concept is the point of approach and point of release of the correction. Generally speaking, these two points are outside the part path. Let us use Fig. 2 as the reference:

3a. Fixing the correction when moving to point P2.

3b. Releasing the correction when moving to point P6.

If points P2 or P6 are too close or in contact with the part, then activation of the correction will lead to a wrong contour. What is more, in order to guarantee accurate correction, the moving distance to point P2 or to point P6 must be greater than or equal to two times the plate radius.

G41/G42: fixing the correction
G40: releasing the correction

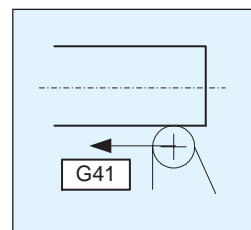


fig. 4a

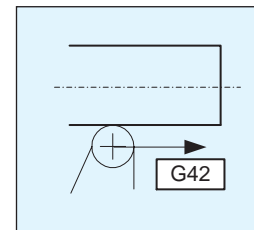


fig. 5a

4. G41/G42 direction of compensation

The direction of compensation is also defined by taking account of the ISO drawing (Fig. 3). The rule is as follows: if, when moving in the tool direction, one is to the right of the contour, then this would be G42. If one is to the left, then this would be G41.

General case

G41: compensation to the left of the contour (fig. 4)

G42: compensation to the right (fig. 5)

Case T51-T52 DECO 20/26

G41: compensation to the left of the contour (fig. 4a)

G42: compensation to the right (fig. 5a)

Compensating the plate radius in the TB-DECO

5. Extension (G81/G82)

There are 2 types of extension at the intersection between the two segments when compensation (G41/G42) is activated.

G81 : linear extension (fig. 6)

G82 : circular extension (fig. 7)

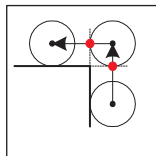


fig. 6

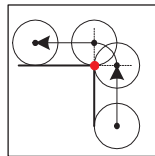


fig. 7

Linear extension is depicted by sharp angles on the part whilst circular extension links us to the segments by way of rounded angles.

5a. G82 is the active compensation by default.

6. Rules to be applied to compensation

Here are some basic rules to obtain correct compensation:

6a. The approach and release points must be away from the part and at a certain distance from it, so as to prevent any marks caused by applying/releasing the correction.

6b. The direction for applying the correction must be along the path, at the start of machining, if possible.

6c. The moving distance for applying or releasing the correction must be at least twice the radius.

6d. The programmed contour segments must never be smaller than the plate radius.

6e. Avoid reversals in direction whilst compensation is active.

6f. Release the active correction if the support has to be changed by another tool or if there is to be a change in direction or on completion of the operation programmed in the TB-DECO.

7. External turning

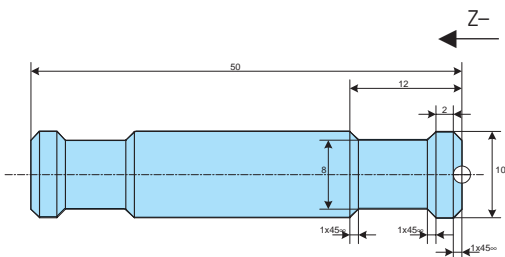


fig. 8

We shall now consider an example of external turning (fig. 8) using an external turning tool ($Q=8$ $R=0.2$) on tool platen 1. The following ISO code has been defined, taking account of the negative direction of work in Z1 :

```
G1 Z1=1 G100 T12
G1 X1=5 G100 G42 G81          (point before compensation X1, Z1
G1 Z1=0.5 X1=7 G100 G42 G81   (approach point with compensation and
                                (linear extension
G1 Z1=-1.2 X1=10.4 F0.01      (1st segment machining
G1 Z1=2.9 G100
G1 Z1=-4 X1=8 F0.01
G1 Z1=-11 F0.02
G1 Z1=-11.5 X1=11 F0.01      (end of machining
G1 X1=30 G100 G40             (cancellation of compensation
```

The following ISO code takes account of the positive direction of work with Z1. In this case, chamfering takes place in front of the part and facing work with exterior turning tools ($Q=4$ and $R=0.2$):

```
G1 Z1= -2 X1=30 G100          (point before compensation X1, Z1
G1 Z1=-1.5 X1=11 G100 G41 G82 (approach point with compensation and
                                (circular extension
G1 Z1=0 X1=8 F0.01            (Chamfering before
G1 X1=-0.1 F0.02              (facing work
G1 Z1=0.5 F0.1
G1 X1=30 Z1=1 G100 G40        (cancellation of compensation
```

7.1 Counter-operation work

When executing counter-operation work on a symmetrical part, refer to the Table (fig. 11) which defines the symbols (+/-) and direction of compensation. The ISO code is the same.

8. Internal turning

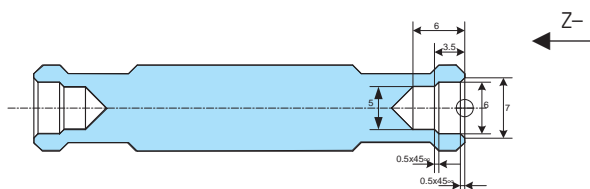


Fig. 9

In the following example, an internal turning operation is being carried out (Q=2 and R=0.2) using a tool on tool platen 1. The direction of work is negative in Z1 :

G1 Z1=1 G100 T12	
G1 X1=10 G100	(point before compensation X1, Z1
G1 Z1=0.5 X1=8 G100 G81 G41	(point of approach with compensation and linear extension
G1 Z1=-0.5 X1=6 F0.01	(1st segment machining
G1 Z1=-3 F0.02	(point P1
G1 Z1=-3.6 X1=4.8 F0.01	(point P2, internal angle point 0.5x45°
G1 X1=4.2 F0.01	(point P3
G1 Z1=1 X1=5.0 G40 G100	(point P4, straight tool exit in Z1
G1 X1=30	

Display of tool path:

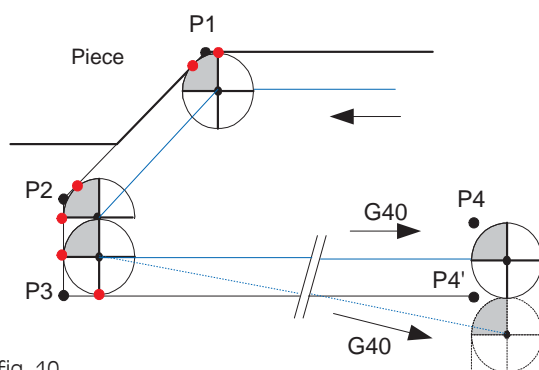


fig. 10

The tool exit is shown on path P3-P4. If point P4' is programmed, the exit is along a slant and the tool will approach the opposite face since compensation has been cancelled. If, on the other hand, point P4 (2x the largest plate diameter in X) is programmed, the exit path will be a straight line.

In addition, the path P2-P3 must be sufficiently long to prevent the tool from causing any material movement, since it is positioned at a tangent to the exit segment (P3-P4).

8.1 Counter-operation work

When executing counter-operation work on a symmetrical part, refer to the Table (fig. 11) which defines the symbols (+/-) and direction of compensation.

Compensating the plate radius in the TB-DECO

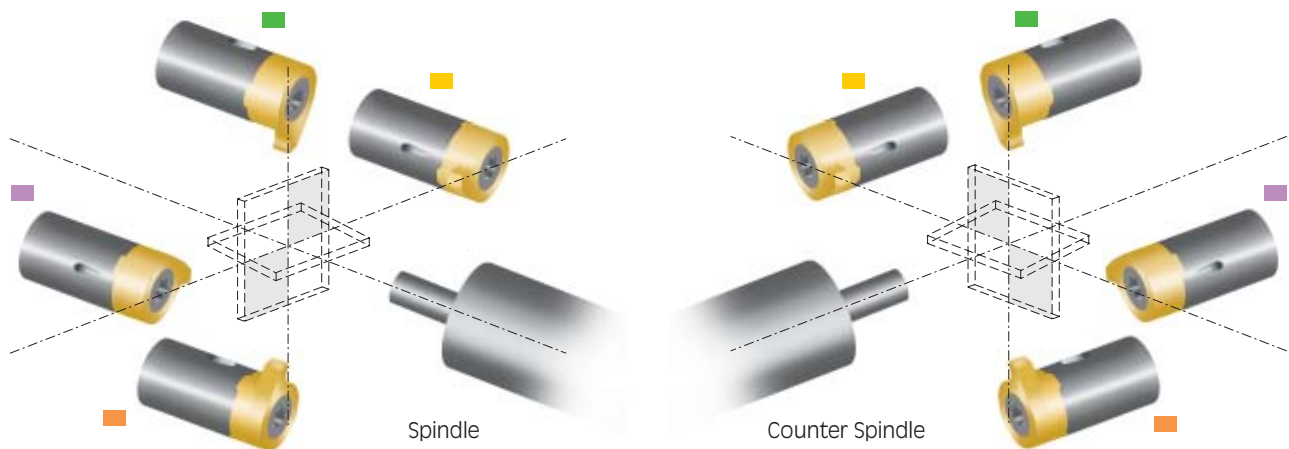


fig. 11

Position of the tool				3					
Support number									
2	T11-T14	T11-T15	T11-T15	T11-T15	Outside	G42	(+)	8(3)(4)	convent.
	T21-T24	T21-24	T21-T23	T21-T25	Inside	G41	(+)	6(1)(2)	convent.
		T51-T53			Inside	G42	(-)	8(3)(4)	convent.
	T31-T33	T31-T34	T31-T33	T31-T34	Outside	G42	(+)	8(3)(4)	(+)
					Inside	G42	(-)	8(3)(4)	(+)
					Outside	G41	(-)	6(1)(2)	(-)
					Inside	G41	(+)	6(1)(2)	(-)
	T41-T44			T41-T44	Outside	G41	(-)	6(1)(2)	(-)
					Inside	G41	(+)	6(1)(2)	(-)
					Outside	G42	(+)	8(3)(4)	(+)
					Inside	G42	(-)	8(3)(4)	(+)
				T51-T53	Outside	G41	(-)	6(1)(2)	convent.
					Inside	G42	(-)	8(3)(4)	convent.
					Inside	G41	(+)	6(1)(2)	convent.
		T41-T43			Outside	G41	(-)	6(1)(2)	(+)
					Inside	G41	(+)	6(1)(2)	(+)
					Outside	G42	(+)	8(3)(4)	(-)
					Inside	G42	(-)	8(3)(4)	(-)
			T41-T43		Outside	G42	(+)	8(3)(4)	(+)
					Inside	G42	(-)	8(3)(4)	(+)
					Outside	G41	(-)	6(1)(2)	(-)
					Inside	G41	(+)	6(1)(2)	(-)
DECO 10	DECO 13	DECO 13bi	DECO 20/26	Kind of turning + tool sense	Compensation [G41/G42]	Dia. à programmer en X [+/-]	Quadrant [0-9]	Tool geometry en X [+/-]	
1									

Fig. 11. Determination of programming values for the plate radius compensation.

Convention:

The table is built for various possibilities in outside and inside turning.

The working direction [Z] is considered for negative. Invert the compensation if the working sense [Z] is positive.

The turning on the diameter is always done on the X axis.

Using principle

1. Choose the kind of machine
2. Choose the tool support on the machine
3. Kind of turning [outside/inside] and sense of the tool (see colours)

Values to extract for the compensation

1. Compensation [G41/G42]
2. To programme diameter in X [+/-]
3. Quadrant [0-9]
4. Tool geometry en X [+/-]

Feel like a trip in september?

There are at least four good reasons for you to go to North Germany!

Are you hoping to come to Hanover and discover the developments in our field and the new offers which could/should give you an advantage over the competition?

Do not forget to visit the TORNOS stand (Hall 21, stand b19) – we are exhibiting our latest innovations and customized solutions...

Four new Tornos solutions will be exhibited

- ◆ For the first time, the DECO concept has been extended to the fixed headstock (42 mm capacity) and the result is astonishing... **DECO 42f**.
- ◆ A MultiDECO – the “integrated turning unit” is offered as a complete solution (machine + bar feeder + swarf conveyer and filtration systems). TORNOS is pushing this logic to the limit with its **MultiDECO 32/6 i**!
- ◆ An integrated bar loader for MultiDECO 20/8, improves your automation: **ROBOBAR MSF 522/8**.
- ◆ New **DECO 20a**, an improved version based on thousands of user's experience...

Once again, the company is using the EMO as a platform to present

new solutions, thereby enabling its customers to be even more competitive...

Do not miss this opportunity to discover these added-value developments...



For those of you who cannot come to Hanover, the new DECO 42 f and DECO 20a machines will subsequently be on show at various in-house exhibitions at our subsidiary companies, in line with the following schedule:

• 12-19. 09. 2001	EMO Hanover
• 26-29. 09. 2001	TORNOS Technologies Italy
• 03-06. 10. 2001	TORNOS Technologies France
• 15-19. 10. 2001	TORNOS Technologies Spain
• 30.10 - 01.11. 2001	TORNOS Technologies UK
• 14-17. 11. 2001	TORNOS Moutier Switzerland

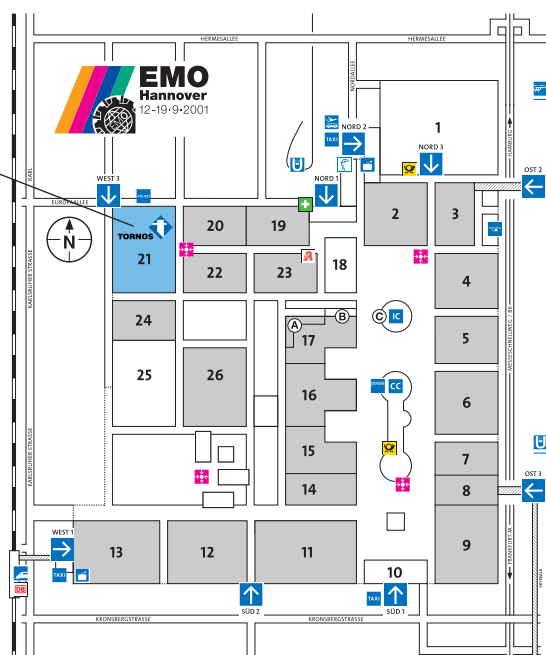
Subject to modification

See you soon...



EMO 2001: TORNOS at a glance...

Date	12-19 th september 2001
Place	Hanover
Hall	21
Stand	b19
Surface area	494 m²
Innovations exhibited	MultiDECO 32/6i DECO 42f ROBOBAR MSF 522/8 DECO 20a
Other products exhibited	DECO 13a DECO 13b i MultiDECO 20/8
Products virtually launched	SBF 532 bar feeder (for single spindles)



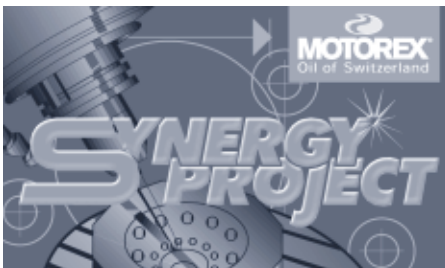
MOTOREX-Focus:

MOTOREX SWISSCUT

High-performance cutting oils of the future

In this section we recently reported on the practical test with the performance-enhancing cutting oil MOTOREX SWISSCUT ORTHO 400. The complete new SWISSCUT generation is now ready for launching on the market. A clearly structured range comprising only four products in different viscosities, it gives results that convince even under the most demanding conditions.

You can learn more about it below...



- **SWISSCUT TWIN** = High-performance multi-purpose cutting oils.
- **SWISSCUT SPEED** = High-performance cutting oils for high-speed machining.

With the development of the novel SWISSCUT cutting oil range, MOTOREX has made a major contribution to performance-oriented production. This is due not only to the work of the development specialists and engineers, but also in particular to its close cooperation with makers and users of machine tools in the MOTOREX Synergy Project. As a result of MOTOREX's know-how in the field of lubrication technology and the intensive exchange of experience between all concerned, the four main pillars of the MOTOREX SWISSCUT programme have been evolved:

- **SWISSCUT ORTHO** = High-performance cutting oils for the most demanding applications.
- **SWISSCUT INOX** = High-performance cutting oils for difficult-to-machine materials.

SWISSCUT ORTHO

MOTOREX SWISSCUT ORTHO cutting oils open up new horizons in modern processes for the machining of workpieces from implant steel. Their innovative formulation combines low-aromatic, solvent-refined base oils with a large number of special additives and fully synthetic components to give cutting oils that withstand severe conditions and have enormous wear reserves in an extremely wide tem-



perature range. This results in an optimum surface finish and low tool wear. ORTHO cutting oils are light-coloured, have low evaporation and odour, are well tolerated by the skin and do not tend to foam.



MOTOREX SWISSCUT ORTHO cutting oils have been specially developed to optimise production processes with implant steels, chrome-nickel, chrome-molybdenum, and silicon steels, Inox 18/8, titanium and its alloys. This enables machining operations to be speeded up by as much as 30% and appreciably enhances the productivity of the plant.

SWISSCUT INOX

MOTOREX SWISSCUT INOX cutting oils are particularly suited for machining high-alloy steels on high-performance machines. The high-tech formulations with low-aromatic, solvent-refined base oils, se-

lected additives and polar, fully synthetic active substances give results that really convince, particularly in accelerated series-machining processes. Their excellent lubricating properties result in a substantial improvement in tool life and surface finish.



Cutting oils of the **MOTOREX SWISSCUT INOX** series are suitable for difficult processes such as broaching, thread-cutting, abrading etc. with hard-to-machine materials such as chrome-nickel and free-cutting steel and magnet core iron. When all factors are optimally matched, **MOTOREX SWISSCUT INOX** cutting oils offer valuable synergies and a substantial enhancement of performance.

Type of processing	Material	Alloyed steel, high-alloyed steel, stainless steel	Steel for implants Inox 316L	Titanium and titanium alloys	Gray cast iron Stabilized cast iron Steel casting	Magnetic steel Low-carbon steel	Free-cutting steel	Magnesium	Non-ferrous metal Structural steel	Aluminium Aluminium alloys
Turning/High precision turning until diam. 10 mm		ORTHO 400	ORTHO 200 ORTHO 300	ORTHO 200 ORTHO 300	ORTHO 300	INOX 300	INOX 300	INOX 100	TWIN 200	TWIN 200
Turning/High precision turning for diam. 11-15 mm		ORTHO 400	ORTHO 200 ORTHO 300	ORTHO 200 ORTHO 300	ORTHO 300	INOX 300	INOX 300	INOX 100	TWIN 200	TWIN 200
Turning/High precision turning for diam. 16-20 mm		ORTHO 400	ORTHO 200 ORTHO 300	ORTHO 200 ORTHO 300	ORTHO 400	INOX 400	INOX 400	INOX 100	TWIN 300	TWIN 300
Polygon milling, sawing		ORTHO 400 ORTHO 300	ORTHO 300 ORTHO 200	ORTHO 300 ORTHO 200	ORTHO 300 ORTHO 400	INOX 300 INOX 400	INOX 300 INOX 400	INOX 100	TWIN 200 TWIN 300	TWIN 200 TWIN 300
Drilling, reaming		ORTHO 300 ORTHO 400	ORTHO 300 ORTHO 200	ORTHO 300 ORTHO 200	ORTHO 300 ORTHO 400	INOX 300 INOX 400	INOX 300 INOX 400	INOX 100	TWIN 200 TWIN 300	TWIN 200 TWIN 300
High pressure drilling		ORTHO 300 ORTHO 400 ORTHO 100	ORTHO 300 ORTHO 200	ORTHO 300 ORTHO 200 ORTHO 100	ORTHO 300 ORTHO 400 ORTHO 100	INOX 100 INOX 300 INOX 400	INOX 100 INOX 300 INOX 400	INOX 100	TWIN 200 TWIN 300	TWIN 200 TWIN 300
Threading operations		ORTHO 500 ORTHO 400	ORTHO 500 ORTHO 300/200	ORTHO 500 ORTHO 300/200	ORTHO 500 ORTHO 400 ORTHO 300	INOX 400 INOX 300	INOX 400 INOX 300	INOX 100	TWIN 300 TWIN 200	TWIN 300 TWIN 200
High speed machining		SPEED 200	SPEED 100	SPEED 200	SPEED 200	SPEED 200	SPEED 200	SPEED 100	SPEED 100	SPEED 100

MOTOREX-FOCUS:

MOTOREX SWISSCUT

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SWISSCUT TWIN

MOTOREX SWISSCUT TWIN are high-performance multi-purpose cutting oils that possess a wide range of outstanding characteristics. They owe these to a sophisticated combination of high-grade base oils and a complex package of additives. SWISSCUT TWIN cutting oils therefore possess outstanding versatility. In general they give an optimum cutting performance and surface finish combined with a long

tool life. Needless to say, these products from the SWISSCUT cutting oil range have gone through a long series of practical tests and has excellent performance references.

The MOTOREX SWISSCUT TWIN series of cutting oils is particularly suited for non-ferrous metals and light alloys and also for simple steels. MOTOREX SWISSCUT TWIN machining fluids are in increasing use in many different branches of industry.

SWISSCUT SPEED

MOTOREX SWISSCUT SPEED cutting oils guarantee turbo power in high-

speed machining. The composition of the low-viscosity base oils conforms to the high SWISSCUT standard, while these oils differ from the other SWISSCUT products in their modified additive package for high-speed machining. Their high lubricating and flushing power makes for an excellent surface finish and a long tool life. Furthermore, the SWISSCUT SPEED cutting oil series has an outstanding resistance to oxidation.

MOTOREX SWISSCUT SPEED cutting oils are particularly suited for the high-speed production of parts from high-alloy steels and also from non-ferrous metals and light alloys. MOTOREX SWISSCUT SPEED has made a name for itself in fields including the aerospace industry, mould-making and turbine construction.

If you have any queries you would like to discuss with the MOTOREX specialists concerning the new generation of SWISSCUT-cutting oils, please contact:

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customer service „SWISSCUT“
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CH-4901 Langenthal
or send an e-mail to:
motorex@motorex.com



New devices...

Providing your production shop with increased safety...

Option 5480

Fire-protection equipment.

Application

During extreme machining operations of flammable materials (titanium, stainless steel...), where there is a high risk of fire and where precautions are strongly recommended.

For all these cases, if the customer needs a DECO and wants maximum security, then Tornos recommends the installation of an INCOM type fire-protection unit.

This unit automatically brings the source of the fire under control.

Detection is assured by a UV flame probe located above the machining area.

The alarm simultaneously actuates:

- shut-down of the fume extractor (where fitted);
- the emergency stop of the machine;
- the alarm siren;
- triggering the valve fitted to the CO2 extinguisher.

The extinguishing agent, in liquid form (carbon dioxide), is released through the hose to the extinguishing nozzle also located above the machining area.

As this agent leaves the nozzle, it changes into gas and, at a pressure of 60 bar, displaces the oxygen from the air and stifles the flames.

In order to limit the action of this unit to those cases where it is really required, actual triggering takes place after a signal lasting for more than 4 seconds.



Comment

This device requires option 5485 – i.e. "Interface for the fire-protection device".

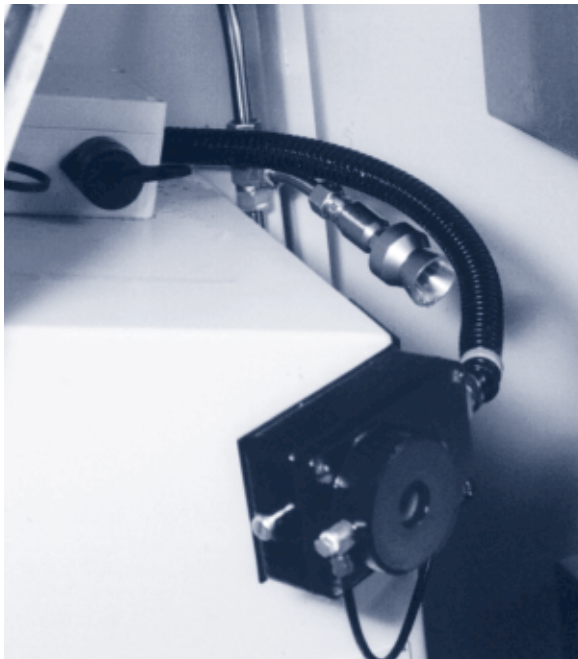
If the machines have integral or central smoke extractors, then these must, as a matter of course, be fitted with a shutdown or sealing system.

This modification will, of course, feature on the FILTERMIST extractors on machines fitted with the fire-protection device, supplied by TORNOS.

The unit will have to undergo annual maintenance by approved personnel.

Compatibility

This unit is compatible with all DECO and MULTIDECO machines.





Technical properties

Types of probe:

1 UV probe

1 temperature probe

Extinguishing liquid:

carbon dioxide (liquid)

Capacity 10 liters (DECO 7a/10a and 13a)

Capacity 30 liters (DECO 20a/26a)

Capacity 40 liters (MULTI-DECO)

Connection:

Supply via the machine