

The DMG MORI
magazine for
customers and
interested readers

ECOLINE – The unique
new *ecoMill* V series
with the new
DMG MORI *SLIMline*®
multi-touch control.

Additive Manufacturing –
Hybrid machining with
laser deposition welding
and 5-axis milling on one
machine.

NLX and CTX –
Success stories in
universal turning
with unrivalled stability
and precision.

CELOS® and DMG MORI
Software Solutions –
Complete networking of
machines within a manu-
facturing organisation.

DMG MORI

JOURNAL

N° 1 – 2016



CELOS® and DMG MORI Software Solutions.

CELOS®, the app-based control and operating system from DMG MORI, is as easy to use as your smartphone and networks all machines within a manufacturing organisation.

Find out more
on page

TRENDS AND INNOVATIONS IN 2016

DMG MORI SLIMline® multi-touch control

ECOLINE – HIGHEST FUNCTIONALITY, BEST PRICE!

ecoMill V

Compact, efficient, dynamic and precise: the new *ecoMill V* range

4–5



ERP PDM PPS/MES CAD/CAM

CELOS® by DMG MORI

CELOS® and DMG MORI Software Solutions

Perfectly organised processes through the networking of machines within a manufacturing organisation

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CNC Scout – Browse all readily available machines online at a glance.

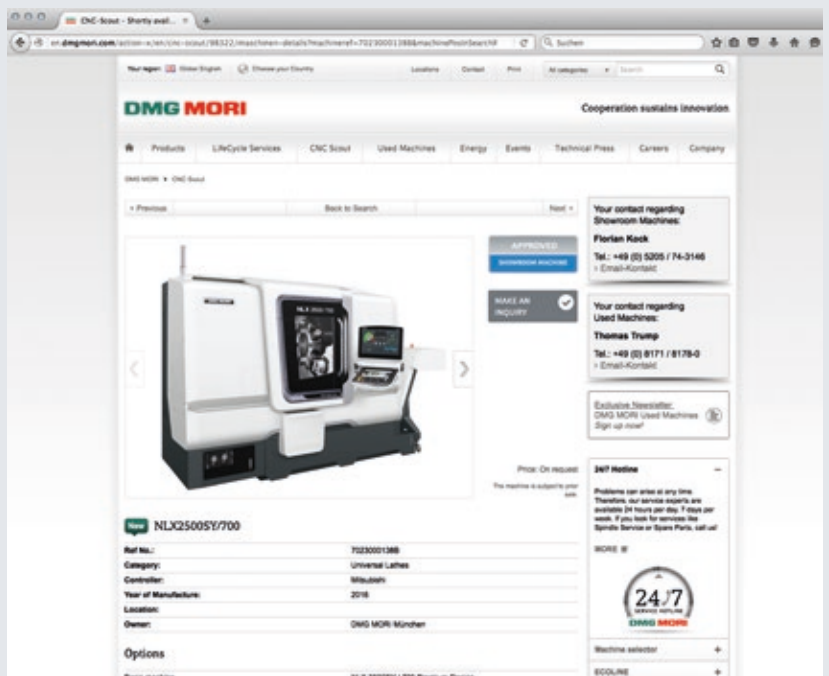
Browse our online list of immediately available machines, updated daily, and find your dream machine with the right configuration at: cnc-scout.dmgmori.com

More than 700 machines available immediately!



View all available products and services:

cnc-scout.dmgmori.com



DMG MORI

Cooperation sustains innovation

Products LifeCycle Services CNC Scout Used Machines Energy Events Technical Press Careers Company

DMG MORI CNC Scout

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Your contact regarding Used Machines: Thomas Trump Tel.: +49 (0) 9171 / 8179-0 Email: t.trump@dmgmori.com

Exclusive Newsletter: DMG MORI Used Machines Sign up now!

24/7 SERVICE

Machine selector

ECOLINE

Ref No.: 7223001386

Category: Universal Lathes

Condition: New

Year of Manufacture: 2016

Location: DMG MORI München

Owner: DMG MORI München

Options

Base machine: NLK 2500S/700 Premium Design

Control: Control M730U with CELOS



Additive Manufacturing

Additive Manufacturing of 3D components
to finished parts quality 6-7

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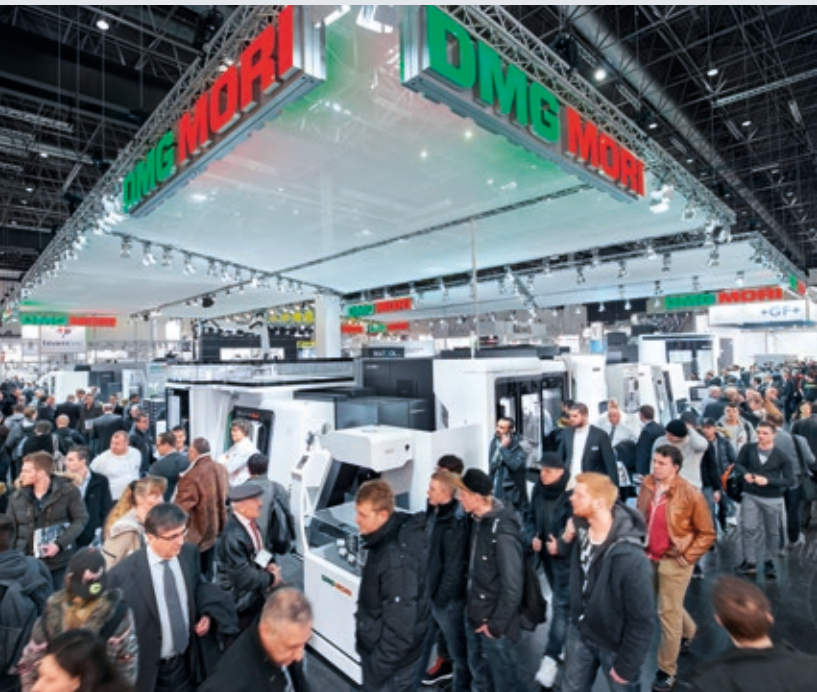
+ DMG MORI Manufacturer Service, DMG MORI Spare Parts 24-25
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Key events –
First half of 2016

+ MMTS, Montreal / CAN	16 May – 18 May 2016
+ Innovation Days, Chicago / USA	17 May – 20 May 2016
+ MECANICA, São Paulo / BRA	17 May – 21 May 2016
+ METALLOBRABOTKA, Moscow / RU	23 May – 27 May 2016
+ Grand opening, Moscow / RU	23 May 2016
+ BIEMH, Bilbao / ES	30 May – 4 June 2016
+ MACH-TOOL, Poznań / PL	7 June – 10 June 2016
+ Innovation Days, Iga / JP	7 June – 11 June 2016
+ Open house, Bielefeld / DE	14 June – 17 June 2016
+ CIMES, Beijing / PRC	22 June – 26 June 2016
+ Opening, Stipshausen / DE	29 June – 1 July 2016



Experience
DMG MORI live:
events.dmgmori.com



MAN INDUSTRY
CO. LTD.



'With the 6 µm positioning accuracy of the ecoMill V, all workpieces meet our high quality standards.'



President Jodai Takanori speaking about his ecoMill V with positioning accuracy of 6 µm.

President Jodai Takanori describes his vision: **'To minimise throughput times with as few machines as possible.** We have a wide range of parts required in low quantities, yet also **short lead times.** Our objective is the just-in-time Toyota production system.' The company mainly machines valve seats, components for shock absorbers and gears for the **automotive industry**, high-precision sintered components for sliding contacts in **train pantographs** and **heavy machineable materials such as carbon.** The key factor in improving productivity is set-up. 'A huge advantage of the **ecoMill V** is its **excellent accessibility**, which makes it easy for us to exchange the workholding fixtures. Additionally, the **large working area** allows us to use multiple clamps for **up to 30 workpieces.** The machine's **outstanding positioning accuracy** of under **6 µm** is a crucial factor in the **quality** of our products. So far we have **not had to reject a single part.** The spindle load display also helps with precision as we now know exactly when a tool has to be changed. The **high-speed spindle** rated at **up to 12,000 rpm** served by the magazine for **30 tools** allows us to reach **high machining speeds** and quickly respond to orders with **short delivery times**; this greatly improves the **competitiveness** of the company. Another advantage of the **ecoMill V** is its beautiful **design**', says the president: 'When customers visit our factory, they are very impressed by the machine and they justifiably get a good feeling about its **quality.** The **chip removal** is also **optimal** and the working area is very easy to keep clean.'



MAN INDUSTRY CO., LTD.
288-1 Bessho, Maizuru City, JP-Kyoto 624-0805



View the
ecoMill V video



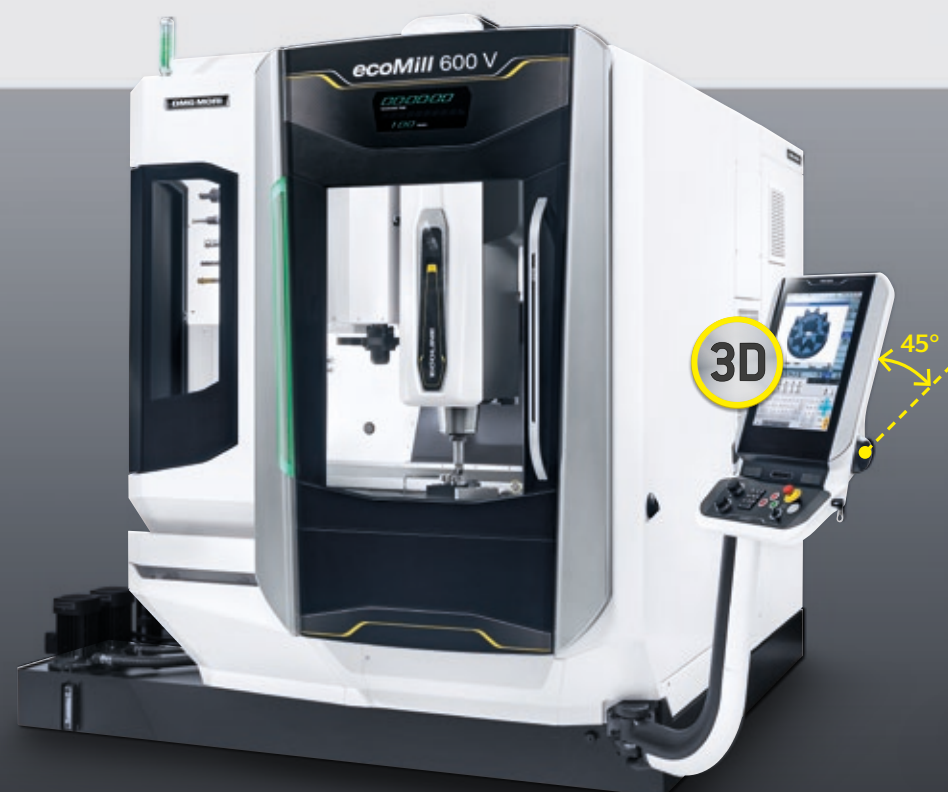
Find out more about
the ECOLINE range at:
ecoline.dmgmori.com



**18-month standard
warranty for
ECOLINE machines**
for components and service

ecoMill V – Maximum precision at an unbeatable price!

- + **MAXIMUM PERFORMANCE AND EFFICIENCY**
with 12,000 rpm milling spindle (standard)
- + **MAXIMUM PRECISION**
with directly coupled ball screws
- + **RAPID TOOL MAGAZINE**
with 30 tools (standard)
- + **PERFECT ERGONOMICS**
for efficient loading and unloading
- + **VISIBILITY AND ACCESSIBILITY**
with the large working area and 850 mm table height
- + **MAXIMUM RELIABILITY**
wear and scratch-resistant surfaces



Sandvik Coromant Tool Kit for the ecoMill V range

Purchase an ECOLINE machine and get a Tool Kit from our technology partner Sandvik Coromant at a special price. The Tool Kit contains tools, tool carriers and inserts so you can get your production under way as quickly as possible. Thanks to our technology partnership with Sandvik Coromant, you can take advantage of tool packages optimally suited to ECOLINE and personalised advice.

19" DMG MORI SLIMline® multi-touch control – intuitive interface for quick and easy operation.

MAXIMUM RELIABILITY

- + 3D control technology
- + Better view with the 19" multi-touch monitor
- + Improved control and overview of the machine status
- + Panel features a 45° swivel range for more convenient operation
- + DMG MORI SMARTkey®

MORE EFFECTIVE OPERATION

- + Quick and easy access to parameters and user data
- + Management and documentation of job and process data
- + Efficient data management with DXF Import (optional)

MORE OPERATING COMFORT

- + Simplified process for reliable touch control with full ASCII keyboard
- + The latest version of ShopMill
- + Elements optimised for the touchscreen
- + 3D simulation with touch-based functions



15" DMG MORI SLIMline® with MAPPS IV on FANUC control system.

- + MAPPS IV user system with control console and front-end Windows PC
- + 3D machining simulation for easy contour verification
- + CNC operation through use of the external and user storage area
- + Import and release of programs using external PCs
- + File display and note function for accessing operating instructions, drawings and texts

ø 80 × 98 mm
Milling head // Toolmaking
Material: Stainless steel (grade 1.4305)
Machining time: 40 min.



150 × 150 × 70 mm
Demo part // Mechanical engineering
Material: Steel (grade 45)
Machining time: 2 min.



ø 180 × 15 mm
Adjusting ring // Mechanical engineering
Material: Aluminium
Machining time: 19 min. 13 sec.



15" DMG MORI SLIMline® with MAPPS IV on FANUC

19" DMG MORI SLIMline® multi-touch control with Operate on SIEMENS



ADDITIVE MANUFACTURING

PTOOLING



'With Additive Manufacturing we can produce a part that is 30 % lighter and 50 % stronger, produce it faster, and material costs will be lower.'



Marv Fiebig, president of PTooling, manufactures components up to ø 500 mm for the energy industry, aerospace and injection moulding on his new LASERTEC 65 3D.

Marv Fiebig, president of his certified, six-member family business PTooling in the Canadian town of Amherstburg, has over 35 years of hands-on **manufacturing engineering** experience spanning industries such as oil and gas equipment, gas compression, aerospace and injection moulding: 'Our machine tools are new, well maintained, robust and durable. We have invested in the **most innovative technology** available on the market today and we gladly welcome competitive challenges to prove we are the best of the best. We are proud to be using the first **LASERTEC 65 3D** hybrid laser deposition machine from DMG MORI available for service provider work in North America. This machine not only enables **laser deposition**, but also provides full **5-axis vertical machining capability** for the manufacture of challenging components up to ø 500 mm. The **flexible interchange** between **laser deposition welding** and **5-axis milling** not only translates into huge **material cost savings** for our customers, but also opens the door to previously impossible design geometries.'



PTooling
200 St. Arnaud Street, Amherstburg,
ON N9V 3X9 Canada
marv@ptooling.ca, www.ptooling.ca

(All rights reserved by CIM-Canadian Industrial Machinery)



Laser deposition welding + 5-axis milling
= ADDITIVE MANUFACTURING



Additive Manufacturing of 3D components to finished parts quality.

LASERTEC 65 3D –
Laser deposition welding and 5-axis
milling intelligently combined.

ADDITIVE MANUFACTURING

- + **Best-in-class finishes** and component precision
- + Laser deposition welding with powder nozzle: **10 x faster** than the powder bed method
- + **Complete machining to finished parts quality** with fully automatic switching between milling, turning and laser operations
- + Cross-process software module
- + Build-up welding even of various **material combinations** including **stainless steel, Inconel 625/718, non-ferrous metal alloys and Stellite**



CELOS®
by DMG MORI

ULTRASONIC

THE 3 MAIN APPLICATIONS

Manufacturing



Multiple materials
e.g. copper on Inconel



Built-in cooling channels

Repair



Blade tip repair

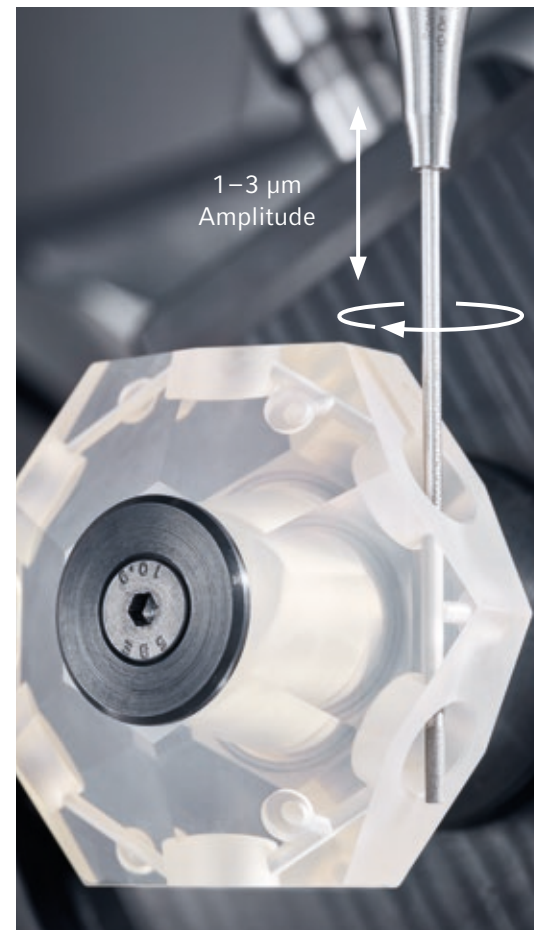


Bucket for a Pelton turbine

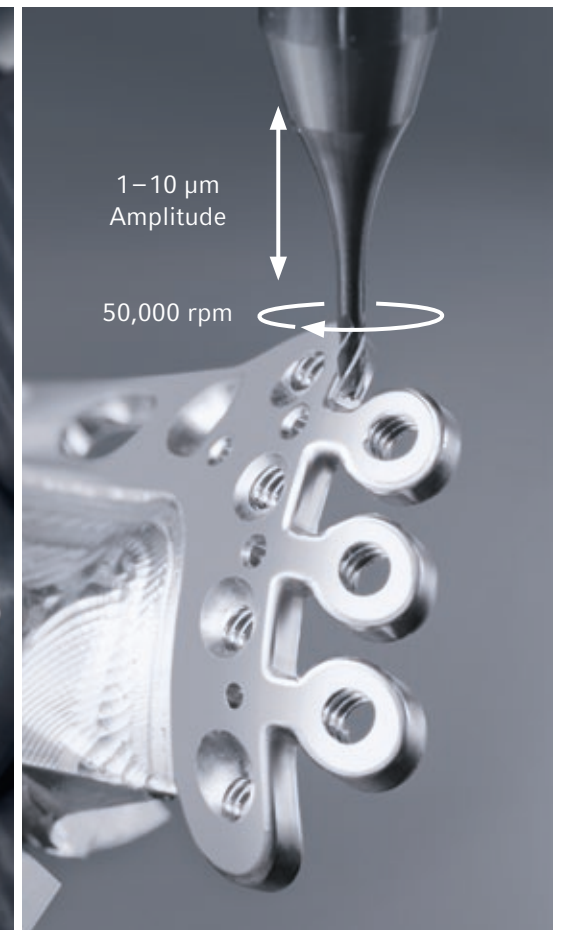
Coating



3D coating of a drill bit



ULTRASONIC 1st generation
For grinding materials including glass,
high-performance ceramics,
sapphire and carbide



NEW: ULTRASONIC milling
of heavy-duty metal alloys
and composites

2nd generation ULTRASONIC – Grinding / drilling / milling

World première:
ULTRASONIC 20 *linear* – HSC milling
at up to 60,000 rpm as well as ULTRASONIC
grinding and milling at up to 50,000 rpm
and with a CELOS® app.

- + HSC milling at up to 60,000 rpm*
- + ULTRASONIC external / internal cylindrical grinding with turn-mill table rated at up to 1,500 rpm*
- + CELOS® with built-in ULTRASONIC app for automatic frequency and amplitude detection and tracking*

* Optional

The new **ULTRASONIC 20 *linear*** makes ULTRASONIC grinding, drilling and milling as well as HSC milling possible on one machine.

Save the date:
Opening
Stipshausen
29 June – 1 July 2016



CELOS®
by DMG MORI



View the
LASERTEC 65 3D
video



Find out more
about the
LASERTEC range at:

lasertec.
dmgmori.com



Hybrid CAD / CAM
for Additive Manufacturing and material removal.

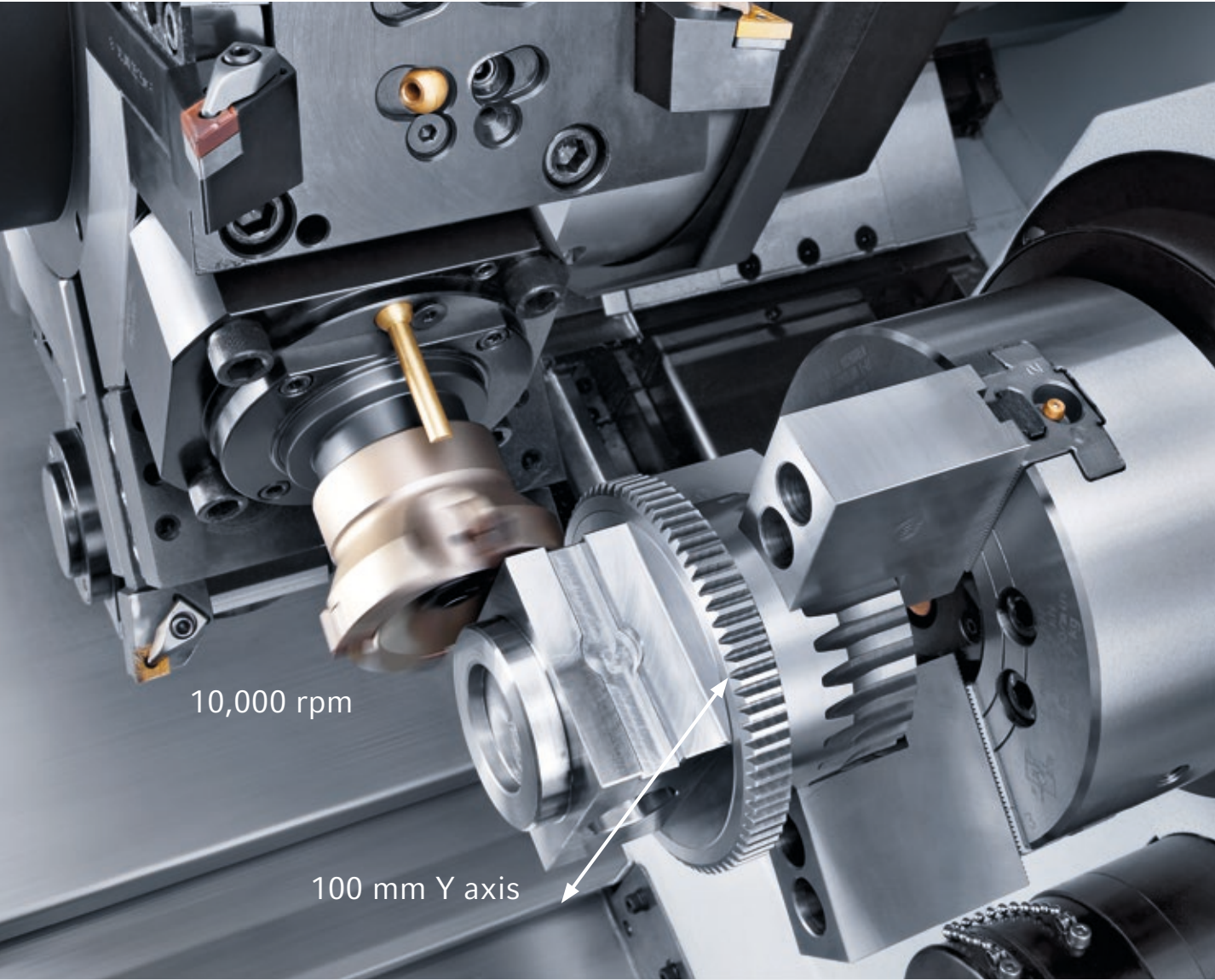


Adaptive process control
Automatic adjustment of laser output.

LASERTEC 4300 *3D* –
Laser deposition welding with built-in 6-sided
turn & mill complete machining of workpieces
up to 660 × 1,500 mm and 1,500 kg.

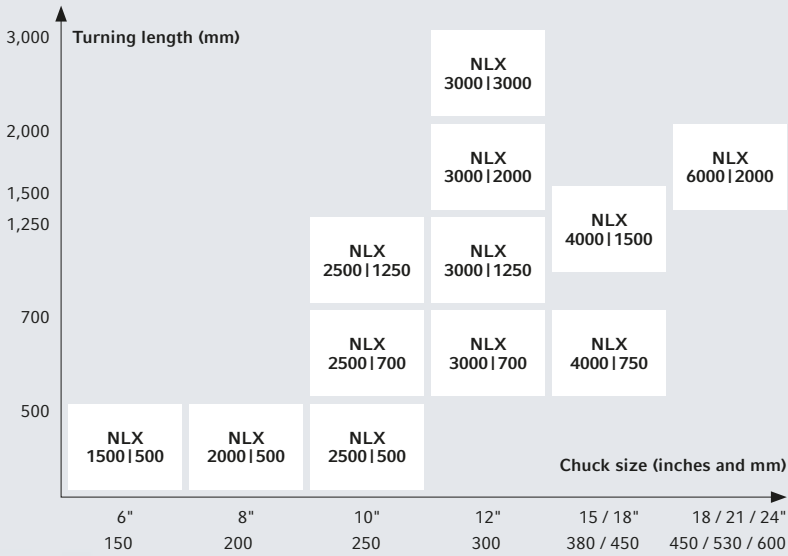


CELOS®
by DMG MORI



Box ways in all axes and the turret with BMT® technology make it deal for heavy machining.

➤ The right solution for every application – the NLX range with 12 machines.



NLX 2500SY|700
The success story with counter spindle and Y axis.

CELOS®
by DMG MORI

➤ NLX 2500SY|700 – 6-sided machining with main and counter spindles and a turret with a 100 mm Y traverse.

From a 2-axis turning machine to complete machining in 6 degrees of freedom with a counter spindle and Y axis, the NLX range has something for every application.

NLX RANGE

- + **Box ways with a width of up to 180 mm in all axes** with optimal damping characteristics and dynamic stiffness
- + **Temperature control solution**, built-in coolant circulation in the machine bed for improved thermal stability
- + **BMT® turret** (built-in motor turret) at up to **10,000 rpm or 117 Nm** for milling performance comparable to that of a machining centre
- + **Various automated components** available, including bar loader and portal loader



Find out more about the NLX range at:

nlx.dmgmori.com



Download the brochure for the NLX range:

download.dmgmori.com



NLX 2500|700

- + **Chuck components up to ø 460 mm** or 366 mm with Y axis, maximum chuck size ø 300 mm (12")
- + **Bar machining up to ø 80 mm**
- + 100 mm Y axis (Y and SY configuration) for eccentric machining
- + **BMT® turret** (built-in motor turret) rated at 10,000 rpm **for milling performance similar to that of machining centres** and up to 20 tool positions
- + **BMT60 interface**, optionally with VDI-TRIFIX® (12 positions)
- + **CELOS®** with MAPPS on MITSUBISHI



NEW: Besides the NLX 2500SY|700, the NLX 2500Y|700 is now also being built by GILDEMEISTER Italiana S.p.A. in Brembate di Sopra, Bergamo, Italy.

ø 81 × 147 mm
Tensioner // Automotive
Material: S45C
Machining time: 17 min. 43 sec

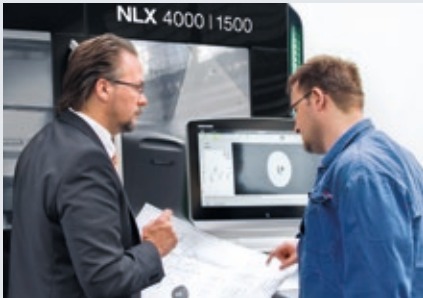


ø 153 × 170 mm
Pulley // Mechanical engineering
Material: SCM435
Machining time: 19 min. 10 sec



SIEFER
TRIGONAL®

60 % shorter throughput times with turning and milling at up to 100 Nm in one set-up.



Gerd Birkenkamp (left), Managing Director of Siefer Trigonal®, speaking about his NLX 4000 | 1500.

Under the Trigonal® brand, **Wilhelm Siefer GmbH & Co. KG** produces mixing and grinding machines for working with low to high-viscosity products in the form of liquid mixtures or solids in liquids. Since early 2015, an **NLX 4000 | 1500** with a **BMT® turret for driven tools** rated at up to 100 Nm has strengthened the firm's production capability. 'We work exclusively with stainless steels and therefore rely on powerful manufacturing technology', says Managing Director Gerd Birkenkamp. The **stability** of the NLX machine is important as the basis of **excellent, long-term precision on the µm scale**. In the same context, he also praises the **coolant circulation** built into the machine bed and the resulting **high thermal stability**. Additionally, the decisive productivity factor is the option to carry out **turning and milling in one set-up with the Y and C axes**, as quantified by Birkenkamp: 'Complete machining has **cut throughput times by at least 60 % in some cases**.'

SIEFER
Trigonal® - Maschinen

Wilhelm Siefer GmbH & Co. KG
Bahnhofstr. 114, D-42551 Velbert
info@siefer-trigonal.de, www.siefer-trigonal.de

CTX Universal turning machines

50 % higher precision and speed with the high-precision turret and active cooling.

- + Chuck components up to \varnothing 410 mm, chuck up to \varnothing 400 mm (16") and bar machining up to \varnothing 102 mm
- + 6-sided complete machining with the optional counter spindle rated at up to 360 Nm
- + < 10 µm tolerance on diameter
- + < 10 µm thermal stability with active cooling
- + 80 bar coolant pressure at every tool position
- + 50 % higher driven tool speed, continuous operation 100 % DC with 6,000 rpm
- + 12-position VDI40 disc-type turret with 10 / 10 kW, 36 / 28 Nm (40 / 100 % DC)
- + Linear drive in the X axis with 1 g acceleration, maximum precision and a 5-year warranty
- + CELOS® with Operate on SIEMENS



NEW: 50 % higher speed at 6,000 rpm during continuous operation.

CTX beta 500 *linear* and CTX beta 800 *linear* – 50 % higher precision and speed.

< 10 µm thermal stability through active cooling of the turret disc and the tool drive.



Delivery times starting at just four weeks!*

* Delivered ex works from Bielefeld.

CTX beta 800 *linear*
Minimal chip-to-chip time with the linear drive with 1 g acceleration.

linear *DRIVE*
5-year warranty

CELOS®
by DMG MORI

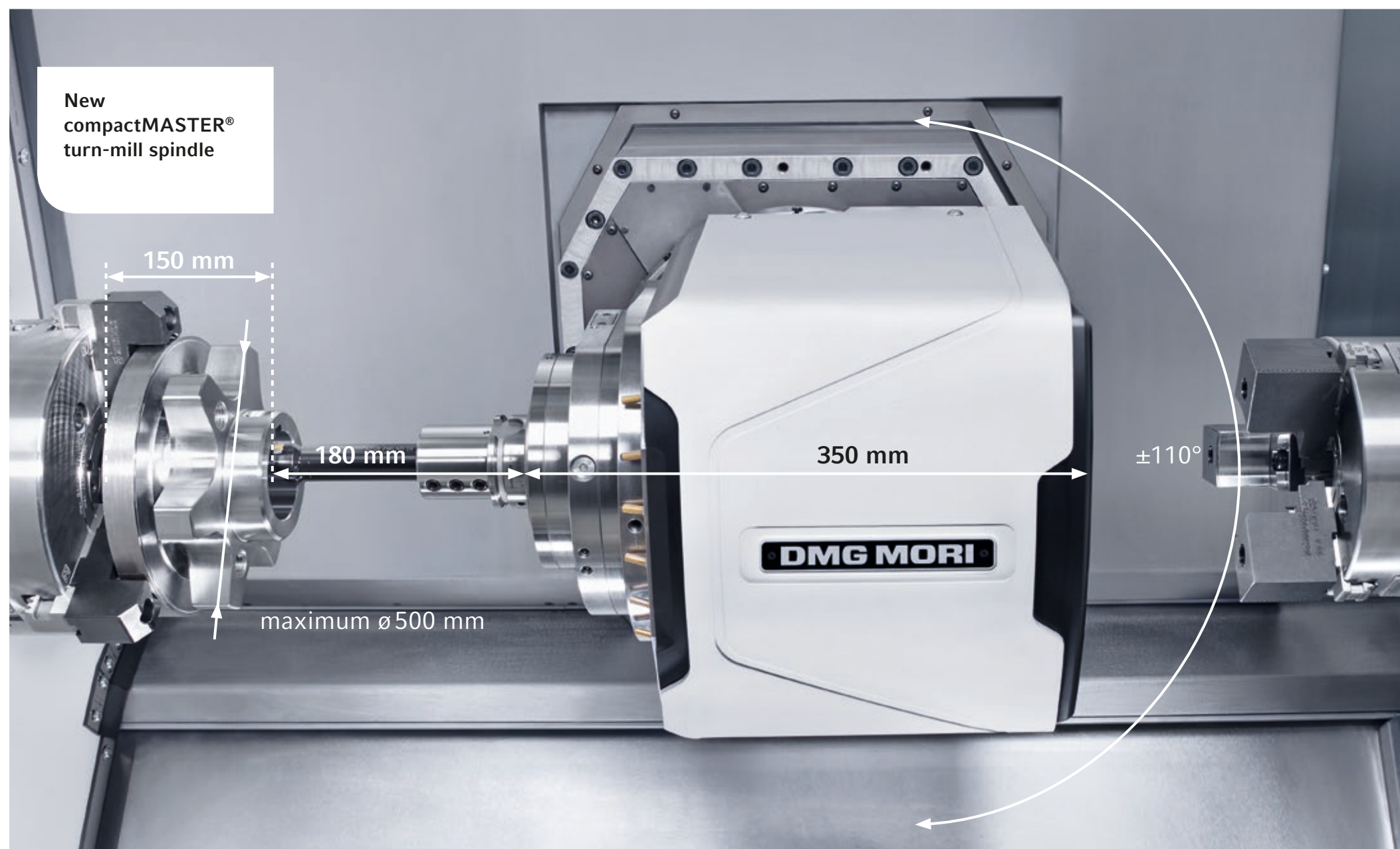


Magnetic absolute length and angle measurement systems are the perfect solution for optimising the performance of machine tools.

With a high response speed of up to 200 m/min, the SR67A/27A linear scales are the perfect solution for highly precise, dynamic machine tools with linear motors. Additionally, their high robustness makes them ideal for heavy machining.

The absolute magnetic concept of the SR67A / 27A series guarantees:

- + 200 m/min response speed for high-speed applications
- + High resistance to vibrations and shock for optimal material removal rates. The SR67A's vibration resistance is 250 m/s² and the shock resistance is 450 m/s²
- + It has the same coefficient of thermal expansion as steel for minimal temperature influence
- + Up to 0.01 µm resolution for highly precise measurements
- + Resistant to moisture, oil mist and dust for high reliability, even in harsh environmental conditions



120 Nm torque, 200 mm Y axis.

CTX beta 800 TC with the compactMASTER® turn-mill spindle – the valuable advantage over every universal turning machine.

\varnothing 230 x 250 mm
Control housing // Engineering
Material: C45
Machining time: 28 min.



- + 100 % universal turning
- + 100 % milling: 120 Nm and 200 mm Y axis
- + 100 % more tools as standard (24 positions), optional chain magazine for up to 80 positions
- + Optimal milling tools with the Direct Drive B axis with $\pm 110^\circ$ swivel range, steplessly indexable
- + Multi-tools – short chip-to-chip times similar to those of a turret machine
- + Optimal accessibility, with a working depth of just 350 mm to the spindle centre
- + CELOS® with Operate on SIEMENS

Up to 60 % shorter programming times with 11 exclusive **DMG MORI** technology cycles with conversational programming.

Find out more on page 16



View the
CTX beta 800 TC video



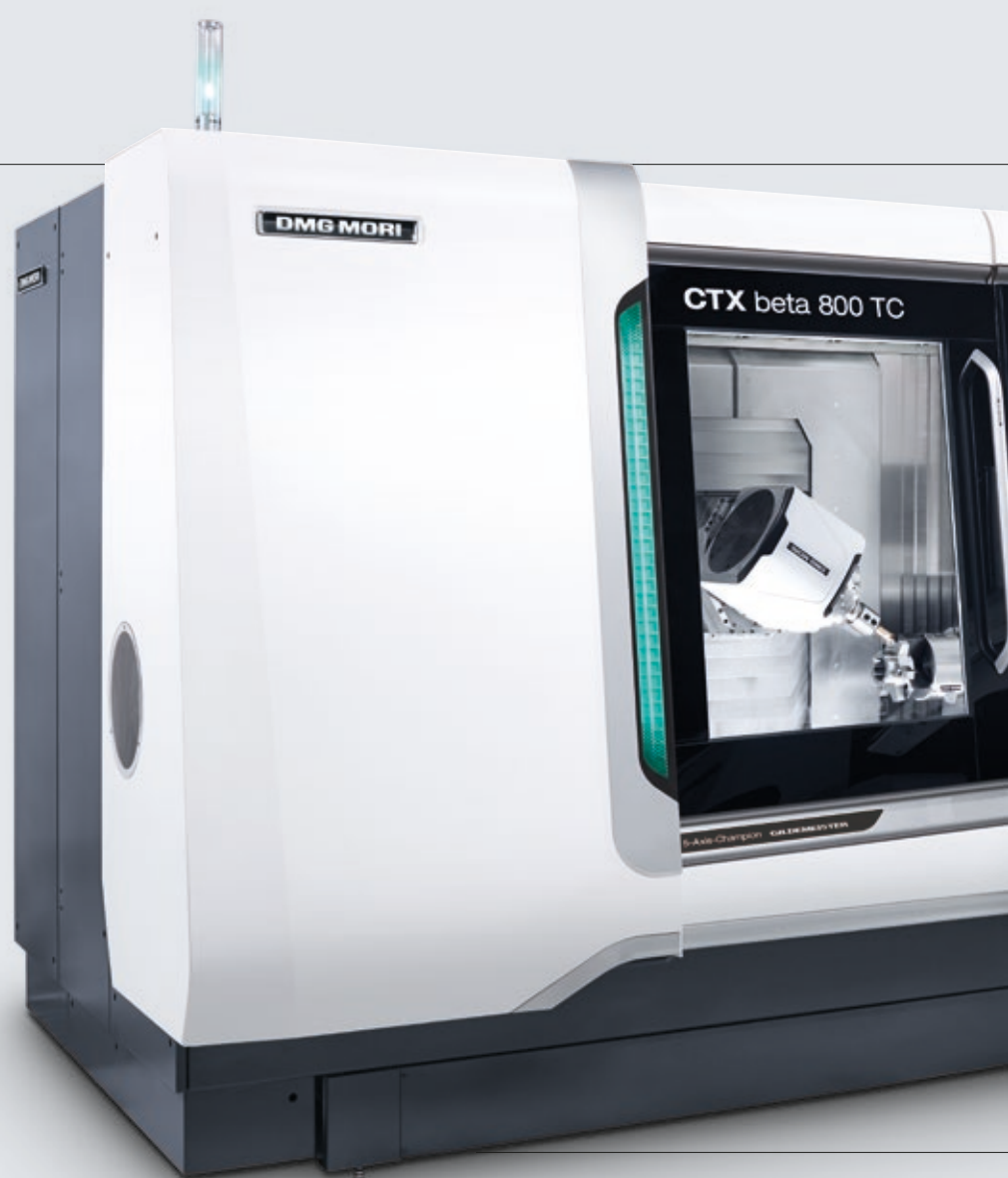
Find out more about
the CTX TC range at:

ctx-tc.dmgmori.com



Download the brochure
for the CTX TC range:

download.dmgmori.com



DMG MORI COMPONENTS

compactMASTER® – Turn-mill spindle with similar milling power to that of a machining centre.

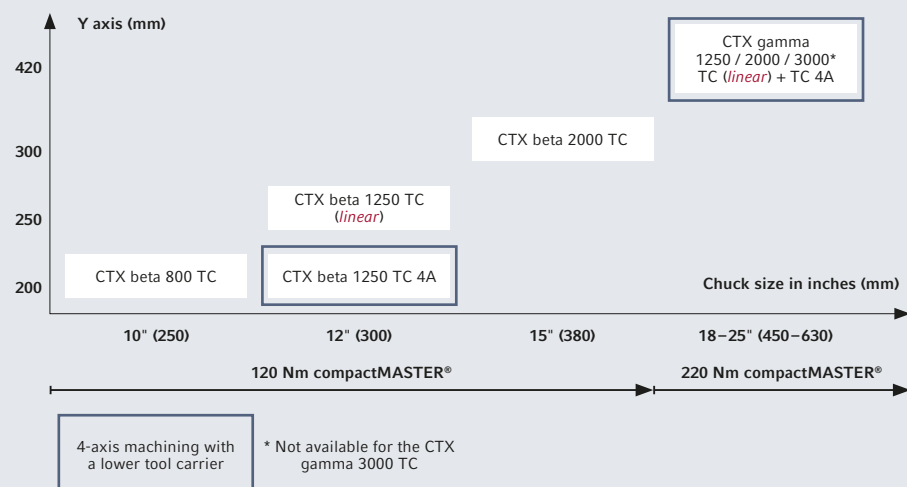
530 cm³/min material removal rate*

- + Face milling head \varnothing 63 mm // $a_e = 30$ mm // $a_p = 10$ mm
- + Spindle speed: 1,768 rpm ($V_c = 350$ m/min)
- M20 threads***
- + Thread size M20 \times 2.5 mm // Spindle speed 606 rpm

* CK 45 // compactMASTER® rated at 120 Nm

Size compactMASTER®	CTX beta TC	CTX gamma TC
Spindle length	350 mm	450 mm
Speed	12,000 / 20,000 rpm	12,000 rpm
Torque	120 Nm	220 Nm

CTX TC – Turn & mill complete machining: From universal machining to production turning with a second tool carrier.



World première: CTX gamma 3000 TC – 800 mm X-axis travel and the new compactMASTER® turn-mill spindle rated at 220 Nm torque.



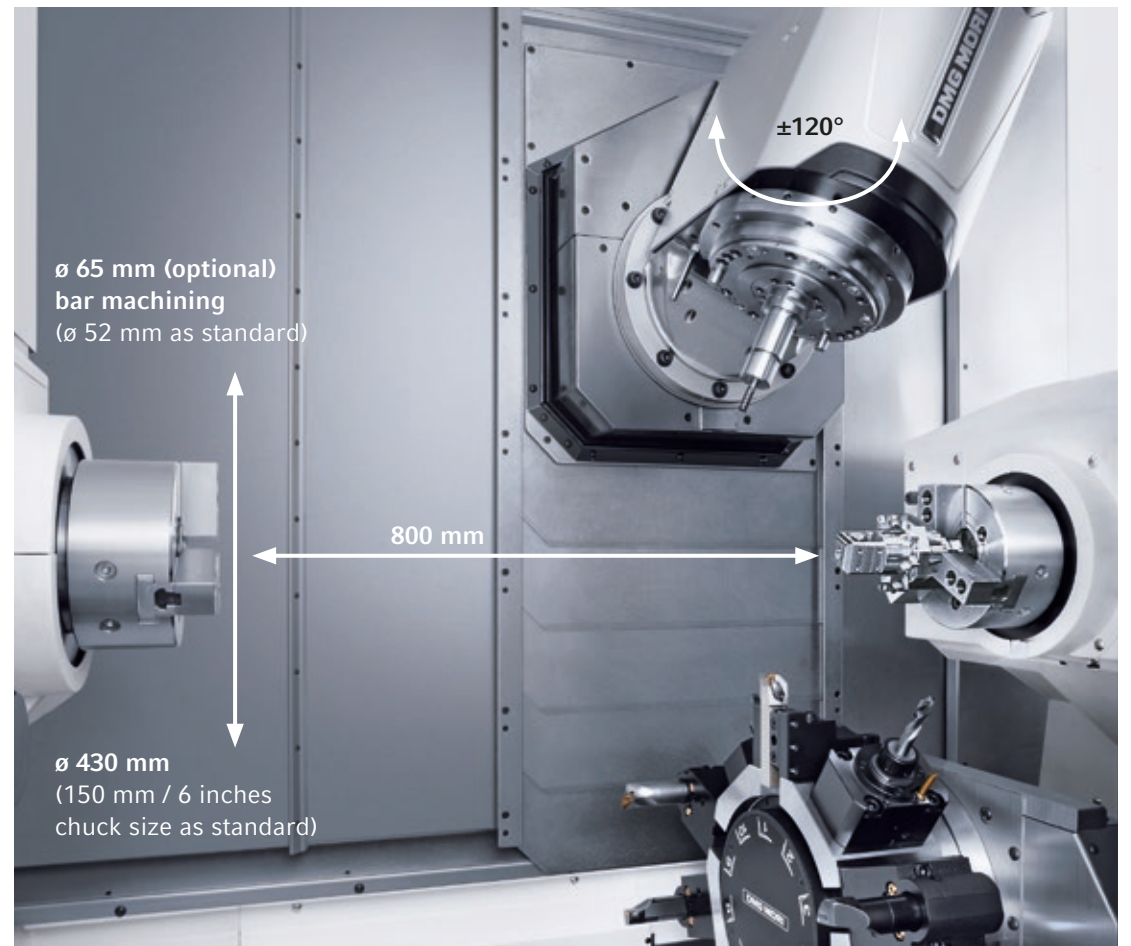
CTX beta 800 TC – fully turn-ready as a universal package.

(including chuck, chip conveyor, internal coolant supply, 2 \times multi-tools etc.)

by DMG MORI
Magnescale

CELOS®
by DMG MORI

NTX Turn & mill complete machining



6-sided complete machining with main and counter spindles; maximum productivity with two tool carriers.

\varnothing 60 mm
Acetabulum // Medical
Material: Titanium
Machining time:
7 min. 30 sec.



\varnothing 90 \times 106 mm
Toolholder // Tooling
Material:
1.2343 (X37CrMoV5-1)
Machining time: 15 min.

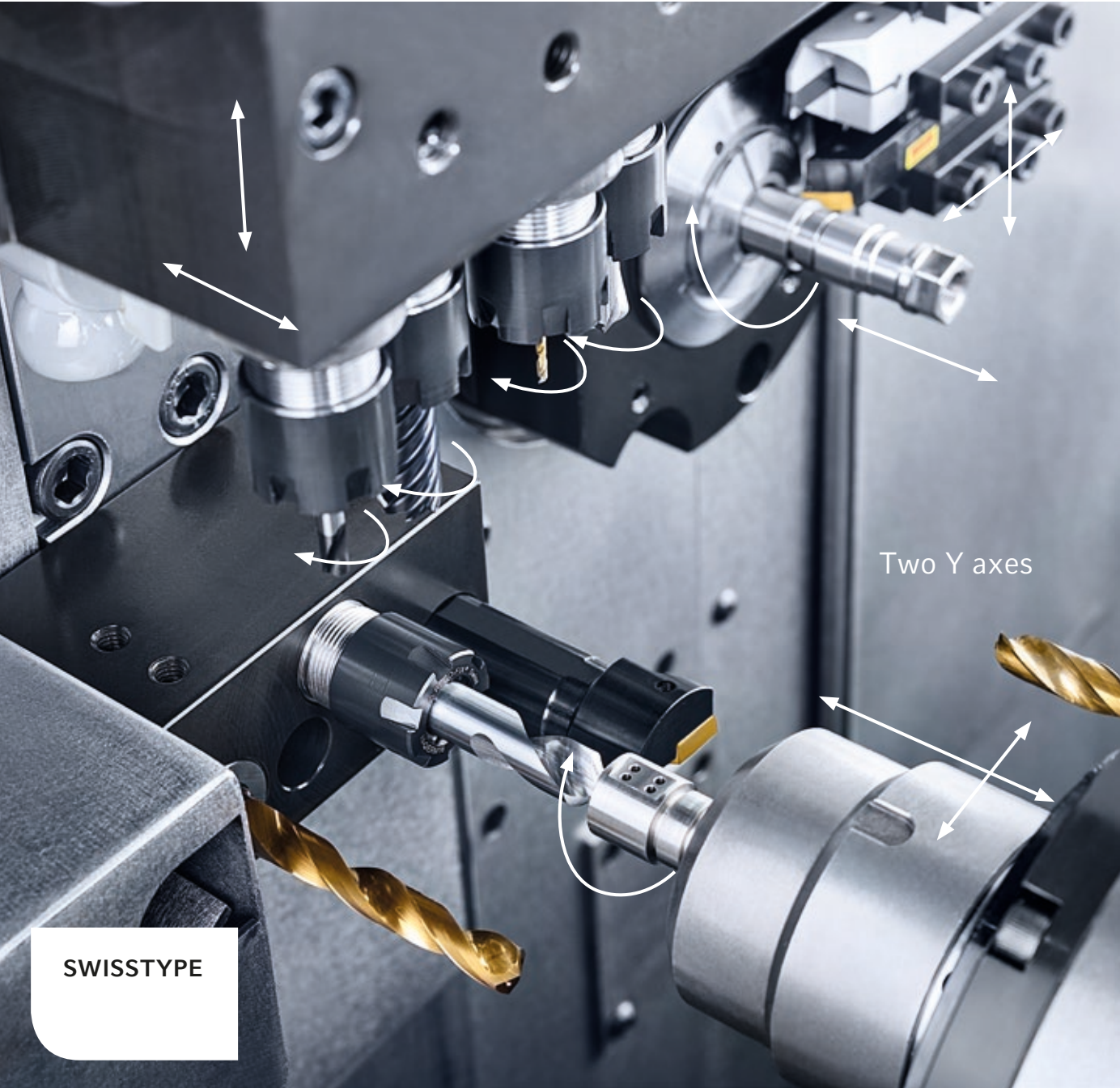


NTX 1000 – Production turning with a second tool carrier.

- + **Direct Drive** (DDM® technology) in the B axis for **5-axis simultaneous machining** of complex workpieces for the medical, tool, aerospace and automotive industries: $\pm 120^\circ$ swivel range in the B axis and 100 rpm rapid traverse
- + **Capto C5 turn & mill spindle** rated at up to 20,000 rpm, 12,000 rpm as standard
- + **Synchronous machining** with B axis and lower **10-position turret** (optional)
- + **Bar machining** of complex workpieces up to 65 mm in diameter, 52 mm as standard; chuck up to 200 mm in diameter
- + **Workpieces up to 800 mm in length and 430 mm in diameter**



CELOS®
by DMG MORI

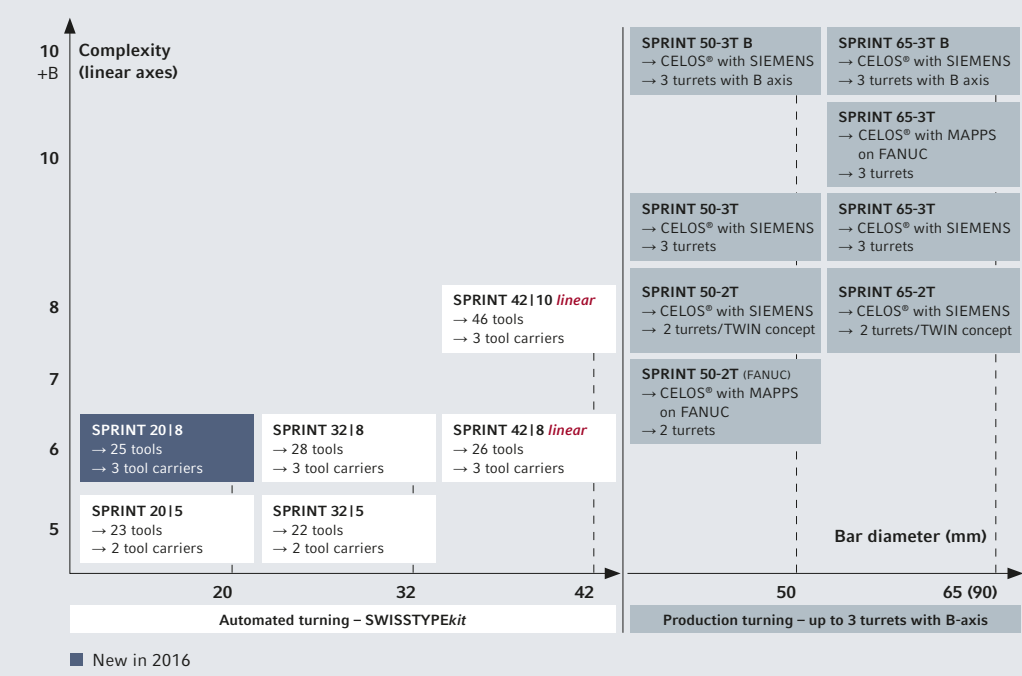


➤ Working area of the SPRINT 20|8 with 6 linear axes and 2 C axes; up to 25 tools can be used on 3 independent tool carriers for 4-axis machining at the main spindle, 8 positions for driven tools.

NEW: SPRINT 20|8 –
For machining workpieces
up to $\varnothing 20 \times 600$ mm in
a footprint of under 2 m².

- + 6 linear axes and 2 C axes
- + 25 tools on three independent tool carriers for 4-axis machining at the main spindle
 - 4 driven tool positions for the main spindle (radial)
 - 2 stationary deep-hole drilling tool positions for the main spindle (frontal)
 - 4 driven tool positions for the counter spindle (axial and / or radial)
- + Long workpieces measuring up to 600 mm are discharged through the counter spindle*
- + SWISSTYPEkit* for short and long part turning on one machine, set-up time of less than 30 minutes
- + 20 % shorter tool change times with the quick tool-change system*
- + High pressure coolant* up to 120 bar
- + FANUC 32i-B with 10.4" colour display

* Optional



➤ SPRINT range
now with
14 models.

Delivery times
starting at just
two weeks!*

* Delivered ex works
from Bergamo.

SHORT TURNING

$\varnothing 16 \times 50$ mm
Valve // Hydraulics
Material: Stainless steel (X8CrNiS18)
Machining time: 98 sec.



SWISSTYPEkit

$\varnothing 10 \times 85$ mm
Bone screw // Medical
Material: Titanium (Ti6Al4V)
Machining time: 240 sec.



SPRINT 20|8
6 linear axes and 25 tools
on 3 independent tool carriers.



View the video on
local production in Italy



Find out more about the
SPRINT range at:

sprint.dmgmori.com



Download the brochure
for the SPRINT range:

download.dmgmori.com



CTV Production turning

**SPECK PUMPEN
WALTER SPECK
GMBH & CO. KG**



'Automation solutions that can be flexibly adapted are the future in an age of smaller batch sizes.'

For over 100 years, **SPECK PUMPEN Walter Speck GmbH & Co. KG** in Roth has manufactured pumps and pumping systems for industrial applications. Customers in the **medical technology, chemical and plastics industries**, for example, count on the quality and reliability of these specialised products. Whereas **CNC technology from DMG MORI** has been dominant in manufacturing since the turn of the century, automated systems from **DMG MORI Systems** have also been playing a significant role since 2010. DMG MORI Systems has optimised the production of motor bearing assemblies, for example, by **integrating a CTV 160 and a DMC 635 V**. In 2015 an almost identical system – with a **MILLTAP 700** and a CTV 160 – was added.

'The output of the two systems is enormous', remarks Dieter Meier, Head of Mechanical Production. Every year, SPECK manufactures **more than 250,000 die-cast aluminium bearing assemblies** in each of the two machining cells. However, the high quantity does not mean that the actual batch sizes do not remain relatively small, as the head of production explains: **'We manufacture a number of different varia-**



Dieter Meier, Head of Mechanical Production, is impressed by the enormous productivity of the systems.

tions of the components, so both systems had to be **set up to be extremely flexible**.' This is why **DMG MORI Systems** installed flexible chuck jaws. The equipment in the rotary storage can be adjusted to the right diameter in no time at all.

DMG MORI Systems designed and installed both cells on the basis of the components. **'We were able to start production in under three months'**, says Dieter Meier of the **rapid realisation of the systems**. He believes that automation is the future of manufacturing: **'With their short throughput times, higher capacity and considerable boost to productivity**, automated manufacturing systems pay for themselves extremely quickly.'



**Speck Pumpen
Walter Speck GmbH & Co. KG**
Regensburger Ring 6-8, D-91154 Roth
www.speck.de

BURGMAIER TECHNOLOGIES GMBH + CO. KG



Johann Bernhard (left) and Gunnar Deichmann, Burgmaier Technologies GmbH.

'The SPRINT 65 allowed us to improve our process reliability and cut our previous machining times by 50 %.'

BURGMAIER has specialised in the manufacturing of **precision turning components** for the **automotive industry** as well as the **hydraulic and electronics sectors** for over 80 years. It employs more than 750 personnel at four locations in Germany, France and Slovakia. In the field of turning, **BURGMAIER** has worked closely with **DMG MORI** for many years. When placing an order for **eight SPRINT 20** machines, it also decided to invest in a **SPRINT 65**. **'That allowed us to successfully avoid a short-term production bottleneck'**, recalls COO Gunnar Deichmann. With the **SPRINT 65**, **BURGMAIER** manufactures injector components for a common rail injector for HGVs straight from bar, which eliminates the idle times previously caused by



Production on the SPRINT 65 with unrivalled precision, e.g. flatness of 0.004 mm.

tool changes. **'This also improves our process reliability, and the machining precision is extremely high'**, explains fellow manager Johann Bernhard. The tolerance is reliably **0.02 mm**, whilst flatness and parallelism are an impressive **0.004 mm** and **0.008 mm**. With three turrets, a **swivelling B axis** and 36 special tools, the **SPRINT 65** is immensely productive. The experience of the high-precision turners and the modern **CNC technology from DMG MORI** have cut **throughout times** for this process by **50 %**. Gunnar Deichmann summarises: **'For large batches of 10,000 parts, this is an enormous gain.'**



BURGMAIER Technologies GmbH + Co. KG
Hauptstraße 100-106, D-89604 Allmendingen
www.burgmaier.com

WASINO Automated turning



Managing Director Gianluca Marchetti (left) and Corrado Brevini from DMG MORI Italia (right).



With integrated automation, M.T. is able to produce up to 1,500 parts almost entirely automatically.

M.T. S.R.L.



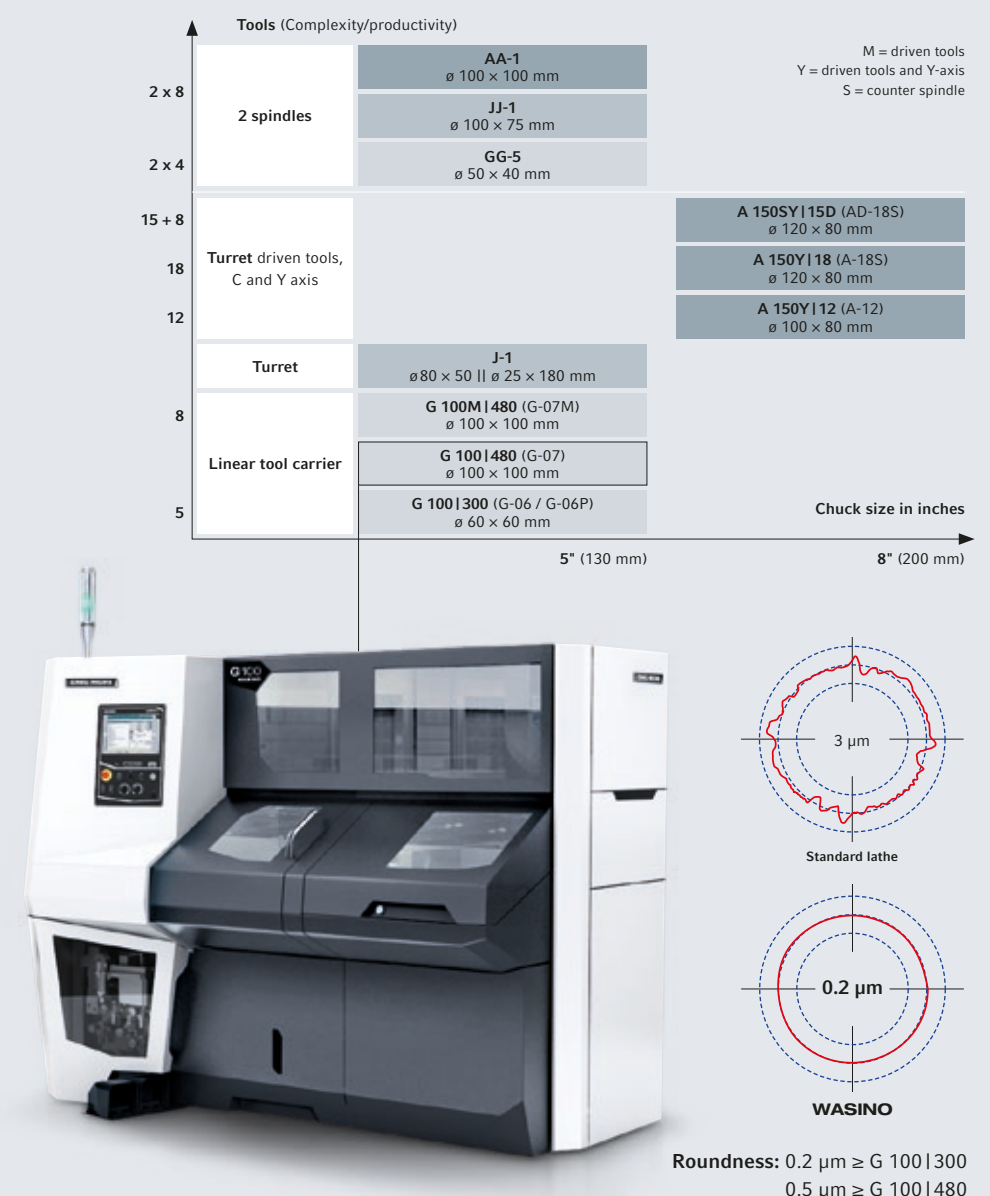
'We can now produce workpieces with roundness of 0.5 µm and surfaces of such quality that they might have been ground.'

Founded as a contract manufacturer for highly complex machine components in 1972, **M.T. S.r.l.** has continuously expanded its range of services. Today the company, based in Marignano, Italy, produces a wide range of driven and stationary tool carriers. In order to expand its production capacity even further, in 2015 Managing Director Gianluca Marchetti invested in a **WASINO automated turning machine**: **'The highly precise WASINO G100|480 (formerly G-07) is ideal for batch sizes from 50 to 1,500 components.'** He believes that the range is the perfect addition to the turning machines offered by DMG MORI.



M.T. S.r.l.
Via Casino Albini 480
IT-47842 S.Giovanni in Marignano
www.mtmarchetti.com

➤ **WASINO portfolio with 10 machines:**
Ultra-precise turning machines with up to 0.2 µm roundness.



CELOS® AND DMG MORI SOFTWARE SOLUTIONS



Christian Thönes
Chairman of the
Executive Board
DMG MORI
AKTIENGE-
SELLSCHAFT,
Bielefeld

'With CELOS® and our DMG MORI Software Solutions we are accompanying our customers on the path to digital production.'

What does Industry 4.0 mean to DMG MORI?

For us, Industry 4.0 means supporting our customers with their digital transformations by providing holistic solutions. The value to the user is always at the heart of our solutions. This is demonstrated by examples such as those of Porsche Motorsport and Schaeffler Technologies in this edition.

How does DMG MORI support its customers?

One central component is CELOS® with its 16 apps. Job, process and machine data can be managed, documented and visualised both on the control system and on the PC. CELOS® also exchanges information with higher-level software systems, thereby building a bridge between the IT landscape and production.

So nothing will work without software soon?

A lot works better with software! This is shown by our DMG MORI Software Solutions such as the DMG MORI process chain and the DMG MORI Virtual Machine. Supported by a digital simulation of the real production process, maximum process reliability and product quality are guaranteed before the first cut is made.

Another example is the suite of 24 DMG MORI technology cycles. With conversational programming, users can create the NC program up to 60 % faster. Additionally, we provide our customers with the new i4.0 sensor package for optimised data handling, improved precision and better process reliability.

DMG MORI Software Solutions for digital production.

CELOS® networks the organisation and planning of Porsche with the production capacity of DMG MORI.



Process planning & 1:1 simulation



Order / CAD data from Porsche



1. ORDER

CAD DATA

- + The developers at Porsche send CAD data for the component to the Porsche Motorsport CNC Competence Center.

2. PROCESS PLANNING

DMG MORI Software Solutions and CELOS® apps for job preparation and process planning.

CAD-CAM / SIMULATION

- + DMG MORI process chain
- + Programmer 3D turning
- + DMG MORI Virtual Machine

CELOS® PC VERSION



JOB MANAGER



JOB SCHEDULER



TECH CALCULATOR



DOCUMENTS

PORSCHE MOTORSPORT CNC COMPETENCE CENTER IN SEEBACH

- + CNC Competence Center built especially for Porsche in order to develop intelligent manufacturing solutions for complex components
- + The focus: long-term technology transfers
- + Five DMG MORI personnel are working in two-shift operations to produce Porsche components
- + The current machine installed:
- + CTX beta 800 TC with CELOS®
- + HSC 70 linear with CELOS®
- + DMU 60 eVo FD with CELOS®



The video on the Porsche Motorsport CNC Competence Center Seebach



You can find more information on the technology partnership with Porsche at:

microsite.dmgmori.com





3. MACHINING

CELOS® apps for setting up and processing orders as well as for live machine monitoring.

MACHINES



JOB ASSISTANT



TOOL HANDLING



SERVICE AGENT



MESSANGER

4. DELIVERY

FINISHED WORKPIECE

- + Take the decisive lead on the track with an efficient process chain.

Workpiece:

100 × 45 × 45 mm, combination holder
Milled on an HSC 70 linear
Material: Aluminium; Machining time: 3 hours

➤ Selected examples from the wide range of components manufactured on DMG MORI machines.



ø 40 × 18 mm
Differential cap
Turned on a CTX beta 800 TC
Material: Aluminium
Duration: 4 min.

36 × 44 × 10 mm
Push rod
Milled on an HSC 70 linear
Material: Aluminium
Duration: 28 min.



200 × 90 × 30 mm
Bearing block
Milled on a DMU 60 eVo linear
Material: Aluminium
Duration: 15 hours

360 × 200 × 25 mm
Bracket for an exhaust system
Milled on a DMU 60 eVo linear
Material: Aluminium
Duration: 4 hours



Porsche Motorsport CNC Competence Center A successful technology partnership.

With CELOS®, the Porsche Motorsport CNC Competence Center of DMG MORI manufactures the highest quality components in perfectly organised processes.

A successful partnership enters the third round: DMG MORI is once again supporting the Porsche LMP1 team as it competes for podium finishes at the 2016 FIA World Endurance Championship (WEC). As a leader in innovation, DMG MORI supplies the Porsche team with the most cutting-edge manufacturing technology. In the **Porsche Motorsport CNC Competence Center** at DECKEL MAHO in Seebach, DMG MORI combines decades of machining expertise with the latest software.

CELOS® – Taking the lead with consistent process organisation

By late 2015, DMG MORI had manufactured more than **60 different components** with a total quantity of over **2,300 individual parts** for the Porsche team. The parts range from complex housings for pumps and electrical motors to intricate attachments for the innovative braking system. The developers in the Porsche LMP1 team supply the necessary CAD data for these components. From then on, the machining experts in Seebach take charge of the **entire process ending in the finished workpiece**.

For DMG MORI and the Porsche team, **CELOS® has proven to be a cornerstone of their partnership**. All machine tools in the Motorsport CNC Competence Center are equipped with CELOS®. The team also has access to the **PC version of CELOS®**.

The **PC version of CELOS® serves as centralised planning and management software**. The individual orders are completely detached from the machines by a **control station**. The **Job Manager** compiles NC programs, set-up plans and tools into a single job package. As a result, no paper technical drawings or documentation are to be found at the Porsche Motorsport CNC Competence Center. The **Job Scheduler** then plans the jobs in detail and assigns them to one specific machine. Using the **CELOS® control console**, the user can then view the current status as well as the effects of last-minute changes. In addition to its planning and management tools, as a control console CELOS® can **retrieve data from all connected machine tools in real time**. The stored data can then be used to carry out operational analyses in order to optimise production in the short and medium terms. The **networking of the machines** in combination with the continuous recording of real-time data is an important step towards **Industry 4.0**.

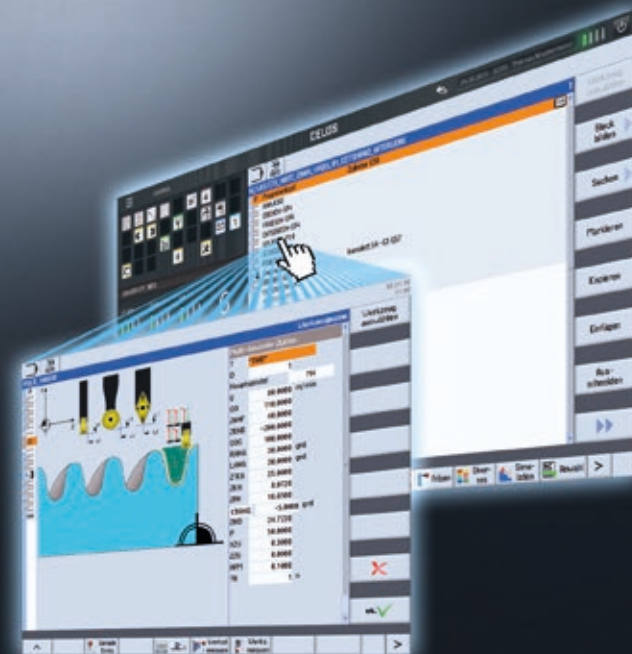


CELOS® PC version as a control station: CELOS® uniquely combines job preparation and the workshop into one highly efficient network.

24 exclusive DMG MORI technology cycles

CONVERSATIONAL PROGRAMMING

- + Up to 60 % faster
- + New applications such as grinding and gearSKIVING
- + Visual, interactive and user-friendly



WITHOUT TECHNOLOGY CYCLES CLASSICAL DIN PROGRAMMING

Software Solutions to make complex machining processes an effortless reality – conversational programming.



View the video about
the DMG MORI technology cycles



WITH TECHNOLOGY CYCLES CONVERSATIONAL PROGRAMMING

Download the brochure with
all 24 DMG MORI technology cycles:

download.dmgmori.com

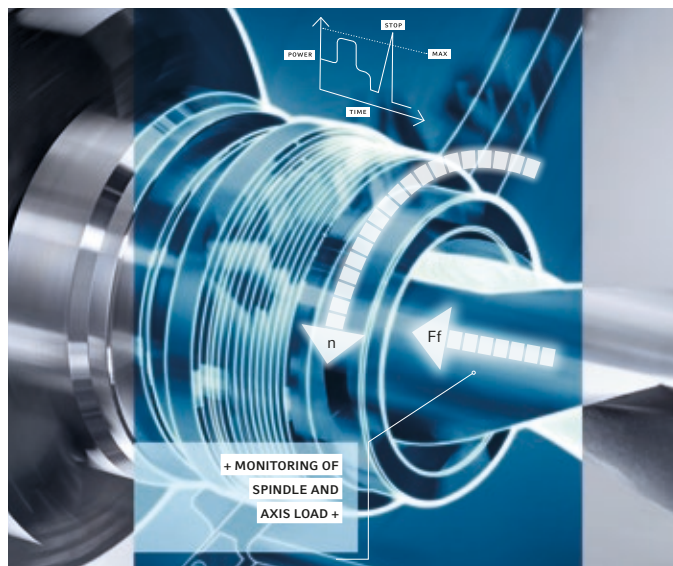


► 3 selected examples



MPC 2.0 – Machine Protection Control

- + Shutdown in case of critical vibration conditions
- + **Vibration sensors** on the milling spindle
- + **NEW: Cutting force monitoring** for drilling and threading
- + **NEW: Imbalance display** at idle speed
- + **NEW: Upgrade** for all milling and mill-turn machines with MPC Version 1.0



Easy Tool Monitoring 2.0 – tool monitoring system

- + **Prevention of damage** through controlled stoppage of the spindles and axis feeds in the event of tool breakage or overload
- + **Immediate feed stop:** Spindle stops in one second (tool retraction from workpiece)
- + **Sensor-free automated learning** of load limits
- + **For turning, milling and drilling operations**



Multi-thread cycle 2.0

- + **Creating large movements** such as for **special threads** which cannot be produced by simple thread cutting
- + **Free definition** of contours, pitches and thread angles
- + **On-point position** – position-based thread generation

NC program conversion

Use legacy programs on new machines! Save time and let us convert your programs now!

- + New DMG MORI machines can **immediately work effectively**
- + Programs are **quickly available**
- + Cycles installed on the legacy machine **are supported**
- + Programs can be **designed for special machines**; special features are taken into account
- + **Additional ramp-up support** available from DMG MORI Academy trainers (e.g. for setting up workpieces)
- + **Time-saving service, no additional personnel required** to re-write programs
- + Ideal for new machines with **CELOS®** by DMG MORI



REFERENCE PROJECT IN THE MECHANICAL ENGINEERING INDUSTRY

We convert legacy programs to run on SIEMENS 840Ds solution-line with Operate user interface.



The shortest possible production start-up with the conversion of more than 500 legacy programs!

When replacing an old turning machine with a new, more powerful CTX beta 800 4A, it would have been necessary to completely rewrite all existing programs for the new machine type. The NC program conversion service from DMG MORI was the perfect solution. Within just one week, all 535 legacy programs were adapted for the new, specific machine concept and converted into the new control format.

Your DMG MORI representative:

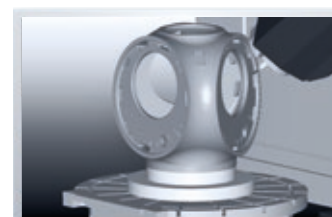
Jörg Harings
Tel.: +49 (0) 52 05 / 74 25 03
joerg.harings@dmgmori.com

DMG MORI process chain

Manufacture quickly and safely with certified post-processors and 1:1 simulation.



Programming with
SIEMENS NX CAD / CAM



1:1 simulation with
DMG MORI Virtual Machine



Production with
DMG MORI machine tools

ZAHORANSKY FORMENBAU GMBH



'Using 1:1 simulation in the DMG MORI Virtual Machine, we were able to shorten our set-up time by 30 %.'



The DMG MORI Virtual Machine is a 1:1 simulation of the DMC 160 H duoBLOCK®, including the actual control system.

Freiburg-based **ZAHORANSKY Formenbau GmbH** – a subsidiary of the ZAHORANSKY Group, which has been successful for more than 100 years – employs **220 personnel** and is synonymous with intelligent solutions ranging from moulds to process control. This expertise makes the company stand out from the competition whilst customers in the **medical, packaging and personal care** industries use the high-quality, sophisticated moulds to sustainably optimise the production of their plastic products. **Process optimisation** is also prevalent in the production facilities of ZAHORANSKY, as demonstrated by the acquisition of a **DMC 160 H duoBLOCK®** including **DMG MORI process chain** and **DMG MORI Virtual Machine**. 'With this software solution we are able to make the best possible use of our machining centre', explains Matthias Faber, Technical Director of ZAHORANSKY. ZAHORANSKY is making full use of the opportunities provided by the **DMG MORI process chain**: its designers develop the complex tools and moulds in SIEMENS NX CAD. The necessary NC program is generated in SIEMENS NX CAM. Now that production is starting on the **DMC 160 H duoBLOCK®**, the **DMG MORI Virtual Machine** will be used. 'The Virtual Machine is a **1:1 simulation of the milling centre**, including the actual control system. This means that we can **simulate the NC program under real conditions**', explains Dietmar Glockner, Head of CAD / CAM at ZAHORANSKY. The design is so reliable that the machining process is expected to go smoothly. 'But if a collision situation arises, we detect it before the

manufacturing process.' After one and a half years, ZAHORANSKY's trust in the **DMG MORI process chain** remains unbroken. The simulation data are automatically sent to the **DMC 160 H duoBLOCK®**, where the machining process starts at 100 % – even overnight in unmanned operation. 'We **save up to 30 % of our time** because we do not have to intervene manually or make subsequent changes to the machine', says Dietmar Glockner of the increased productivity. 'The **machine is operated entirely from the programming station**.' **DMG MORI Machine Protection Control** provides additional security as it constantly monitors vibrations and cutting forces. ZAHORANSKY's investment in the **DMG MORI process chain** quickly paid for itself, as Matthias Faber summarises: 'The **spindle turns practically around the clock** and downtimes are a thing of the past. The **DMC 160 H duoBLOCK®** is therefore being utilised optimally.'



ZAHORANSKY Formenbau GmbH
Bebelstraße 11a, D-79108 Freiburg
info@zahoransky.com, www.zahoransky.com

Ready for the next industrial revolution.



CELOS®, the app-based control and operating system from DMG MORI, is as easy to use as your smartphone and networks all machines within a manufacturing organisation.

CELOS® by DMG MORI is a holistic, **app-based control interface** with a unique **multi-touch screen** for all new high-tech DMG MORI machines. Thanks to app-based structuring, **CELOS® is as easy to use as your smartphone**. With the unique multi-touch display, CELOS® apps facilitate the consistent **management, documentation and visualisation** of order, process and machine data. **16 apps** help the operator prepare, optimise and process production jobs without any errors. The CELOS® app **Condition Analyzer** serves as a platform for visualising, analysing and predicting the status of all machines.

CELOS® INFO HOTLINE

We are happy to help with any queries and provide assistance with operating CELOS®.
Tel.: +49 (0) 83 63 / 89 51 00
Email: celos@dmgmori.com



View the video on CELOS®



Find out more about CELOS® at:
celos.dmgmori.com



Download the CELOS® brochure:
download.dmgmori.com



View the video on
 Industry 4.0



Download the Industry 4.0
 product brochure:

download.dmgmori.com



CELOS®
by DMG MORI

PC version of CELOS® for
consistent production planning
and status monitoring.



i4.0 sensor package

for optimised **data handling**, improved **precision** and increased **process reliability**, consisting of:

- + **Machine Protection Control (MPC)** – Preventive protection with vibration sensors on the milling spindle
- + **Spindle Growth Sensor (SGS)** – A sensor designed to determine and compensate for spindle growth
- + **Tool Dialogue System (TDS)** – Tool identification for manual, contact-free reading and writing of tool data
- + **Internal coolant supply flow monitor** – Internal coolant supply flow monitoring to determine the necessary coolant output

for all monoBLOCK®, duoBLOCK® and portal machines
with internal coolant supply 600 / 980 / 2500 l
(40 / 80 bar); Not with gear-driven spindles



NEW: DMG MORI Condition Analyzer – 60 built-in sensors monitor the machine status.

CONDITION ANALYZER

From big data to smart data – record and analyse machine data with direct feedback to the service team and customer for **maximum machine productivity**.

- + **Collect:** Variable sampling rates, backed-up data transfer to the cloud (every 10 minutes)
- + **Analyse:** Pattern recognition of unusual machine behaviour. Direct feedback to the service team and customer.

SCHAEFFLER
TECHNOLOGIES



Intelligent machine tools with constant status monitoring.

Last year, DMG MORI presented an Industry 4.0 project developed in collaboration with its technology partners. Based on the DMC 80 FD duoBLOCK®, DMG MORI presented a machine tool equipped with more than 60 sensors that transmitted digitised information on components from the sensors to the cloud for the purposes of data collection, storage and analysis. The objective was constant status monitoring within the machine. The app-based control and operating system CELOS® supports the interaction between human and machine.

This generates benefits for users in two ways. The **Condition Analyzer** visualises the process parameters in **CELOS®**, allowing prompt **power and status analyses** to be carried out on the machine. Additionally, the recorded data are compiled within a cloud architecture and analysed with special algorithms.

Schaeffler Technologies in Höchststadt an der Aisch is working out how to convert the data into practical machining knowledge. A DMG MORI pilot machine has been in ongoing operation there since late October 2015. Schaeffler considered the opportunities highly diverse. They range from **better management of the machining process**, e.g. in order to focus more on tool wear, to **lower energy or lubricant consumption**. Likewise, on the basis of empirically determined 'behaviour patterns', the transferred status data can be used to **make qualified predictions about potential damage** to the spindle.

The first step has been taken towards the future of machining and the results are very promising. However, it is still too early for a definitive evaluation. However, Schaeffler expects to produce valid findings before the end of the year. 'The important thing is that we have started and will gradually learn how **Industry 4.0** works in practice from a real production facility', says Martin Schreiber, Head of Production Machines at **Schaeffler Technologies AG & Co. KG**.

DMG MORI

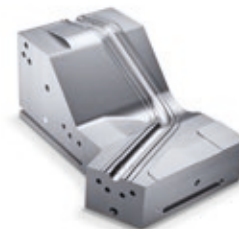
**PREMIUM
PARTNER**

SCHAEFFLER
LUK INA FAG

Schaeffler Technologies AG & Co. KG
Georg-Schäfer-Straße 30, D-97421 Schweinfurt
www.schaeffler.de



ø 400 × 330 mm
Drill bit // Energy
Material: 21CrNiMo2 (1.6523)
Machining time: 18 hours



700 × 450 mm
Tube mould // Tool and mould making
Material: 21CrNiMo2
Machining time: 8 hours



View the video on the
4th generation duoBLOCK®



Find out more about
the duoBLOCK® range at:

duoblock.dmgmori.com



Download the
brochure for the
duoBLOCK® range:

download.dmgmori.com



The benchmark in 5-axis machining.

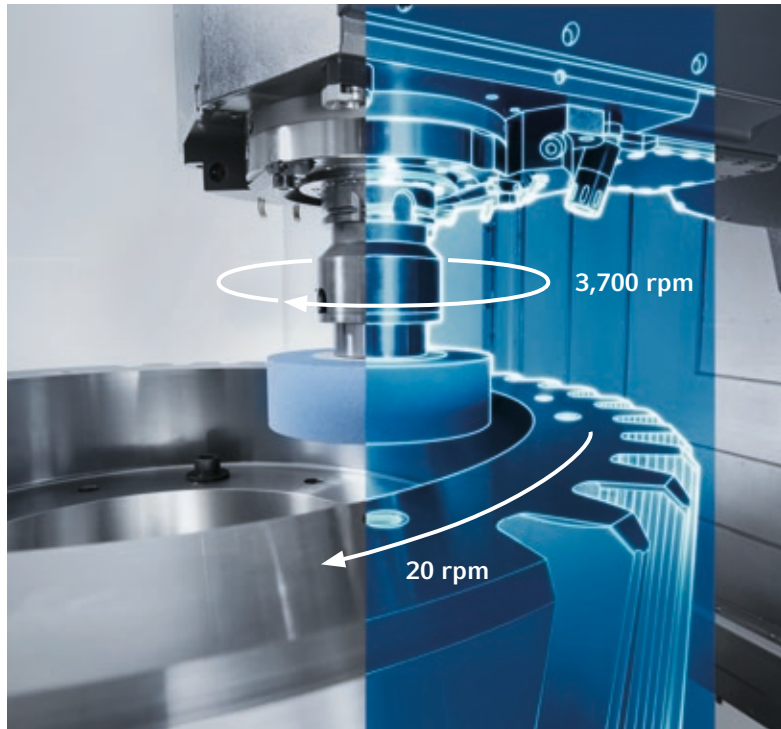
- + **powerMASTER®** – Motor spindle with 1,000 Nm torque,
- + 77 kW and Spindle Growth Sensor (SGS) compensates for spindle growth to ensure maximum precision
- + **The highest flexibility** and shortest machining times with the **new B axis** with 20 % higher stiffness and integrated cable carrier
- + **Large workpieces** of max. 950 mm diameter and 1,450 mm height and a max. load of 1,500 kg
- + **5X torqueMASTER®** – 1,300 Nm, 37 kW, SK50 / HSK-A100 and up to 8,000 rpm
- + **Powerful speedMASTER® spindle** as standard rated at 15,000 rpm, 35 kW and 130 Nm (40 % DC)
- + **Rapid, innovative wheel magazine** with a tool change time of 0.5 second and up to 453 tools in spite of its minimal footprint

DMU 80 P duoBLOCK®
30 % lower energy consumption.

E.g. up to 80 bar as standard with the new, efficient, frequency-controlled high-pressure pump.



DMG MORI TECHNOLOGY CYCLES



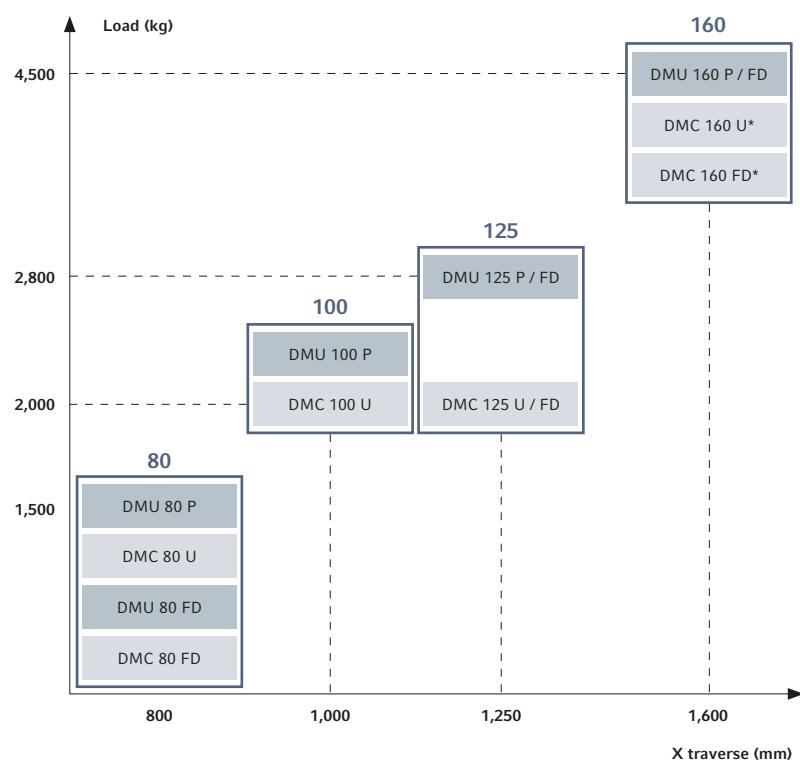
Grinding technology cycle for mill-turn machines.

- + **NEW:** The integrated acoustic **sensor** in the spindle detects the initial contact between the grinding wheel and workpiece
- + For **internal, external and face grinding**
- + **Dressing cycles** for dressing the grinding wheel
- + **Unrivalled surface quality** with built-in grinding technology
- + **Optimal profitability** in production as only one set-up is necessary

More on DMG MORI technology cycles on page

16

The right solution for every application – the duoBLOCK® range with the world première 4th generation **DMU 160 P duoBLOCK®** for large workpieces measuring up to 1,600 mm.

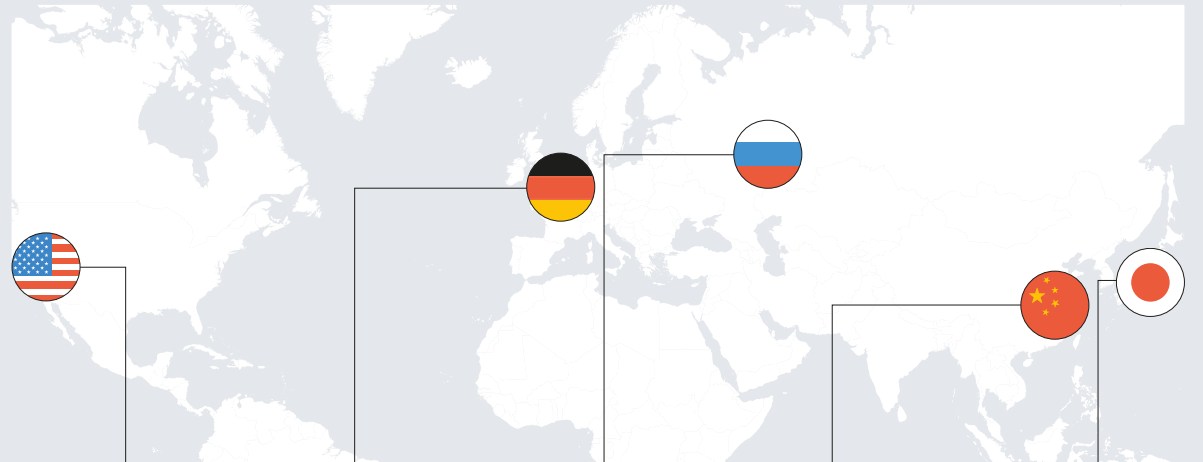


* Available from Q3 2016

DMU Universal milling machines

DMU 50 – the entry point into 5-axis machining.

A GLOBAL PRODUCTION CONCEPT – IN THE MARKET, FOR THE MARKET
Local production ensures short delivery times and a holistically high standard of quality.



Davis, USA



Seebach, Germany



Ulyanovsk, Russia



Shanghai, China



Chiba, Japan

- + **Powerful NC swivelling rotary table** for 5-axis simultaneous machining with a high degree of stiffness
- + Heavy loads up to 300 kg
- + **High-performance inline spindle** rated at **14,000 rpm as standard**, optionally 18,000 rpm
- + Digital drives with **30 m/min rapid traverse as standard**
- + **Tool magazine** can be populated during machining with up to 60 tools
- + **CELOS®** by DMG MORI with SIEMENS and 21.5" ERGOline® Control with multi-touch monitor
- + HEIDENHAIN iTNC 530 with 19" ERGOline® control console



NC rotary table swivel range: -5° to +110°.



CELOS®
by DMG MORI

PORTAL 5-axis universal milling machines

MJM
METALWORKING
MANGNER GMBH



'With 5-axis simultaneous machining on the DMU 340 P, I can meet all of the quality requirements of my customers whilst reducing the throughput times!'



5-axis simultaneous machining of large components on the DMU 340 P.



Jürgen Mangner, the owner of MJM, is impressed by the precision of the portal machines from DMG MORI.

MJM Mangner Metallverarbeitung GmbH started with one used machine in 1997. Today, the family-run company has several factory units in which more than **100 highly qualified experts** provide a holistic range of services in both sheet metal working and in mechanical production. MJM has positioned itself as a service provider to major players in the **mechanical engineering, rail and transportation and pharmaceutical industries**. In terms of mechanical production, MJM relies on a total of **30 machining centres and turning machines from DMG MORI**. With its latest investments including two **DMU 210 P** and two **DMU 340 P** machines, MJM has entered a brand new field of business as a supplier to the mould making industry. The maximum **traverses** are **3,400 × 3,400 × 1,600 mm** and the maximum table load is **16t**. The DMU 340 P and DMU 210 P meet more machining requirements than just enormous component sizes. 'If you want to make a name for yourself as a supplier in the field of mould making, you have to deliver the **best quality**', explains Jürgen Mangner, founder and owner of MJM. With the **portal machines from DMG MORI**, the service provider is able to meet the high precision standards of its customers. '5-axis simultaneous machining with the B axis is another good example of efficiency.' It is ultimately a question of **reducing lead times** for customers whilst keeping the machining results the same. 'To optimise the utilisation of the machines, we let workpieces with long machining times run overnight and at the weekend.'



MJM Metallverarbeitung Mangner GmbH
Schwarzackerstraße 26, D-35232 Dautphetal
info@mjmmetallverarbeitung.de
www.mjmmetallverarbeitung.de



DMU 210 P

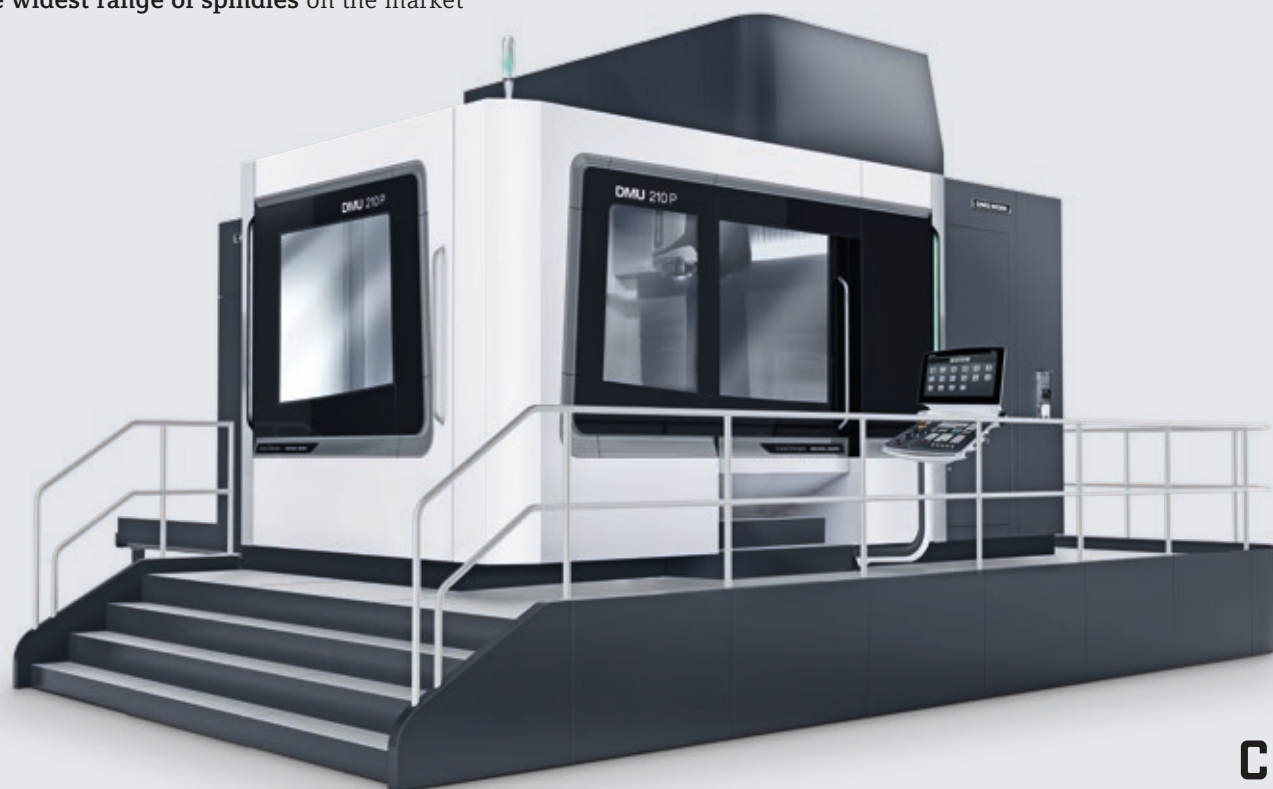
10 t
Table load
(8 t as standard)

DMU 210 P world première 2nd generation with 5X torqueMASTER® for maximum cutting performance.

2016
World
Première
DMG MORI

THERMAL CONTROL

- + Expanded swivel range of 250° and optimised milling head interference contour
- + Maximum long-term precision with cooled linear guideways and active spindle growth compensation
- + 80 % higher torque with 1,800 Nm from the 5X torqueMASTER®
- + Innovative wheel magazine for up to 243 tools (SK50 / HSK-A100) with a minimal footprint
- + The widest range of spindles on the market
- + Cooled drive motors
- + Cooled ball screws
- + Cooled linear guideways
- + Cooled gears in the rotary axes
- + Sensor-based spindle compensation
- + Cooled machine bed
- + Optional: Machine bed temperature control



CELOS®
by DMG MORI

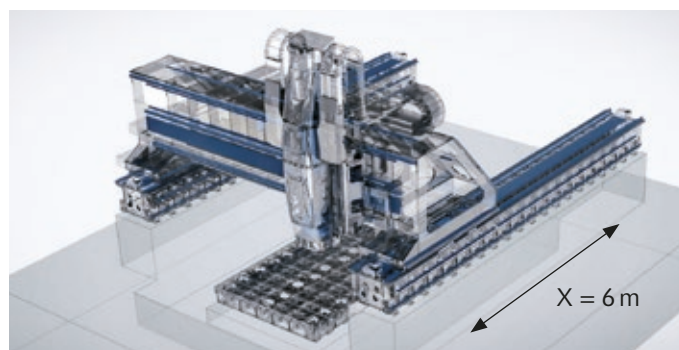
DMU G *linear* 5-axis XXL machining centres



XXL

150 t
Table load

Top: DMU 600 G *linear* under construction in the XXL centre at DECKEL MAHO in Pfronten, the world's most cutting-edge large machine production site.
Bottom: Consistently high precision with temperature stability in the machine structure.



X = 6 m



World première DMU 600 G *linear*: The new high-gantry large machine with a table load of up to 150t.

2016
World
Premiere
DMG MORI

- + High-gantry design with a **maximum table load of 150 tonnes**
- + **Direct Drive technology** in all axes for unrivalled surface quality and highest dynamics (linear motors: X, Y, Z axes; torque motors: A, C rotary axes)
- + **Temperature control** – Extensive cooling for maximum temperature stability, ensuring consistently high precision
- + **Maximum stiffness** – with FEM-optimised machine structural components and EN-GJS-600-3 (GGG60)



View the video
on the XXL centre



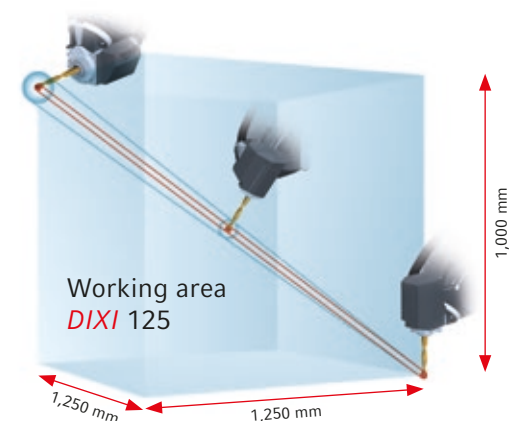
linear IIDRIVE
5-year warranty

CELOS®
by DMG MORI

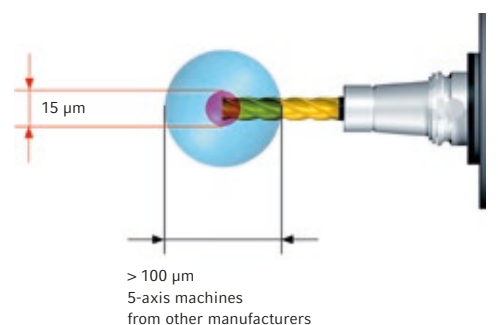
150 t
table load
3 m/s²
acceleration

DIXI

3 TIMES HIGHER PRECISION!



At least three times higher precision overall.



World première *DIXI* 125: < 15 µm volumetric precision on the component.

- + Maximum positioning accuracy of up to **3 µm** in the linear axes
- + Maximum precision thanks to selected components and **scraped contact surfaces** on all geometrically relevant components
- + **Temperature control** for all machine components that generate heat
- + Maximum stiffness for optimal milling performance (GGG60 cast parts)

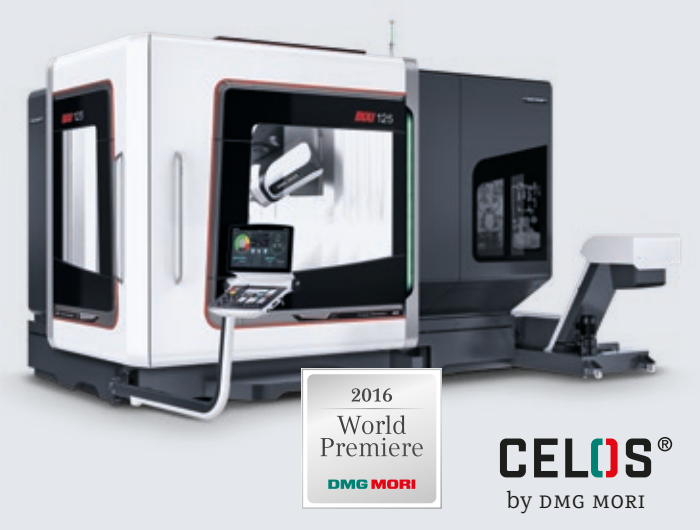


View the video on
the *DIXI* ultra-high
precision machines



Find out more
about the full
DIXI range –
DIXI 125 / 210 / 270 at:

dixi.dmgmori.com



2016
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Premiere
DMG MORI

CELOS®
by DMG MORI



Dr. Maurice Eschweiler
Director of Industrial
Services
DMG MORI
AKTIENGESELLSCHAFT

DMG MORI service – The decisive advantage!

The DMG MORI original manufacturer service is a flexible, high-quality service that accurately meets all of your requirements. From prevention to tailored service products.

You're always in safe hands with service from DMG MORI. Today and tomorrow.



24/7

DMG MORI 24/7 Service
Hotline. Available to you
around the clock.

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www.dmgmori.com

2,500



10 years

On average DMG MORI service technicians have 10 years of experience with DMG MORI machines.

KRONES AG



Exceptional machine availability through holistic service.



FLTR: Thomas Gruber, Head of Machines,
Georg Hofmeister, Head of Blowmoulds Management, Timo Potratz, Production Technology.

Krones AG specialises in process, filling and packaging technology. The company manufactures the highest quality products in order to meet the standards of its customers. It has been in a **service partnership with DMG MORI for many years**. Thomas Gruber, Head of Machines, describes the partnership: 'It is based on extremely transparent dealings with one another. We focus on **developing solutions**.' One priority is a machine availability rate of at least 95 %.

Krones minimises the risk of downtime through **regular maintenance**. When purchasing new machines, Krones has DMG MORI **train its personnel to maintain the machines independently**. However, if a stoppage does occur, the production facility benefits from the **quick response times** of DMG MORI service technicians and the **rapid delivery of spare parts**. 'The free DMG MORI service hotline also supports our personnel', says Timo Potratz, Head of Production Technology.



Krones AG, Böhmerwaldstraße 5
D-93073 Neutraubling, www.krones.com

INSPECTION – THE FIRST STEP TOWARDS TOP PERFORMANCE

With our manufacturer's inspection, you always know where you are. Our service professionals provide a detailed status report after every inspection.



HIGHLIGHTS

- + Check on media supply including pneumatics, hydraulics, cooling and ventilation, central lubrication.
- + Depending on the machine: inspection of covers and windows, main and axis drives, tool changer and magazine, etc.
- + Optional: Replacement / installation of selected wear parts at a fixed price

Contact your local service team
for more detailed information:
www.dmgmori.com

MAINTENANCE – MAINTENANCE BY THE MANUFACTURER FOR MAXIMUM AVAILABILITY

Maintenance by the manufacturer to boost your productivity and reduce your operating costs. Our specialists perform machine status-relevant maintenance according to a checklist.



HIGHLIGHTS

- + Comprehensive maintenance by our service professionals
- + Replacement/installation as necessary of wear parts at a fixed price
- + The extent of maintenance is adapted to meet machine running time requirements

Contact your local service team
for more detailed information:
www.dmgmori.com

MAINTENANCE KITS – LOW-PRICE ORIGINAL SPARE PARTS IN A COMPLETE PACKAGE

Reliably maintain your machines independently. Compiled by our experts and coordinated perfectly for each machine type! Your advantage - everything in one package at a reduced price.



HIGHLIGHTS

- + More than 200 different maintenance kits are available, perfectly tailored to each machine type
- + Ensuring machine availability
- + All important wear parts in one kit
- + Protection against expensive subsequent damage
- + Save up to 25 % with an attractive package price

Contact your local service team for
more information, descriptions and
prices for our maintenance kits:
www.dmgmori.com

technicians

More than 2,500 certified DMG MORI service professionals worldwide provide the fastest possible customer support for more than 300,000 installed machines.



Top equipment

Your DMG MORI benefits: Inspection and maintenance with manufacturer know-how, high-tech measuring equipment and high-precision instruments.

SPINDLE SERVICE – SPINDLE MAINTENANCE KIT

Take preventive steps and maintain your own spindle: The handy spindle maintenance case contains everything you need for this task.



HIGHLIGHTS

- + Perfectly matched to the relevant tool holding system
- + Freely selectable content from the following: Mechanical or digital drawbar force gauge, radial run-out mandrel, dial gauge with magnetic stand, depth gauge
- + Professional support with motor spindle maintenance
- + All components in one system
- + Machine availability and productivity ensured
- + System tailored individually to your needs

TRAINING – YOUR CRUCIAL ADVANTAGE

Application training can boost your productivity, e.g. with shorter programming and set-up times.



HIGHLIGHTS

- + Modular and practical training in how to program, set up and operate your DMG MORI machines
- + Innovative courses, modern teaching equipment
- + Training in small groups, directly on the machine
- + Highly qualified instructors with methodical and didactic certification
- + Training specially tailored to meet your needs at our modern training centres or on-site
- + On-line training in-depth knowledge



View the video on DMG MORI spare parts.



See an overview of courses at the DMG MORI Academy here:

training.dmgmori.com



Find out more about LifeCycle Services at:

lifecycle-services.dmgmori.com

SPARE PARTS

Strong logistics network – top-quality service with a global presence.

We won't keep you waiting: All orders are processed centrally and spare parts are dispatched from the nearest Spare Parts Centre. We use the global network of all our DMG MORI warehouses – for rapid delivery times.



6 LARGE SPARE PARTS WAREHOUSES – FOR FAST SHIPPING AND SHORT LEAD TIMES



GERMANY

Global Parts Centre, Geretsried

Employee: 150
Asset Value: > € 75 Mio.
Shipping: 1.750 Stück / Tag
Availability: 95 %



JAPAN

Global Parts Centre, Nara



CHINA

China Parts Centre, Shanghai



INDIA

Indian Parts Centre, Chennai



THAILAND

Thailand Parts Centre, Ayutthaya



USA

American Parts Centre, Dallas



HIGHLIGHTS

- + **Global logistics network** covers all markets
- + Over € 200 million of spare parts in stock and an **availability rate of over 95 %**
- + **More than 280,000 different items** in stock
- + **Original spare parts** straight from the manufacturer
- + **Wide range of spare parts** also available for older machines dating back to 1970
- + Order from anywhere in the world via our **24/7 Service Hotline**
- + **New and replacement parts** available

DMG MORI TOOL PRESETTING

VAN AARSEN
MACHINEFABRIEK B.V.




Increased productivity
in tool presetting.

Be it a hammer mill, pellet mill or mixer, Van Aarsen, based in the Dutch town of Panheel, has been one of the world’s leading providers of agricultural feed machines since 1949. After its positive experience with machine tools from **DMG MORI**, the company opted for another product from the leader in machine tool innovation for tool presetting: ‘Compared to models from other providers and given its excellent equipment, the **UNO 20170 autofocus** is the most attractive in terms of price’, explains

Jack Coumans, Purchasing Manager. ‘The 400 mm diameter and 700 mm measuring length are ideal for our wide range of tools.’ **The FEM-optimised, thermally stable, cast iron construction** also produces highly accurate measurements.

One highlight of the entry-level system from DMG MORI Microset is the autofocus. It reliably focuses on the cutting edges – precisely and automatically. Van Aarsen benefits from this function especially when the tools are complex, as the autofocus can even **automatically calibrate** several cutting edges in a row. Given the quality standards of Van Aarsen and the number



View the
DMG MORI Microset video

Find out more about
DMG MORI Microset at:
microset.dmgmori.com

Download the tool
presetting brochure:
download.dmgmori.com

of tools used, Jack Coumans draws a clear conclusion: ‘Overall, the **UNO 20170 autofocus** guarantees **maximum precision** as well as a considerable **increase in productivity** in tool presetting.’


Van Aarsen
Van Aarsen International B.V.
Heelderweg 11, NL-6097 EW PANHEEL
www.aarsen.com

UNO 20140 autofocus – Quick and precise.

The UNO works to an exceptionally high degree of precision, achieving perfect results for tools with a diameter of up to 400 mm and lengths of up to 400 mm (optionally 700 mm).

HIGHLIGHTS UNO AUTOFOCUS

- + Automatic focusing of the cutting edge to be measured
- + Best suited for tools with multiple cutting edges
- + SK50 autofocus spindle
- + Can be operated manually



UNO 20140 autofocus



Quality made in Germany –
100% designed and made by HAIMER

HAIMER, world market leader in tool shrinking and balancing technology, is a family run, medium sized company located in Igenhausen, Bavaria near Augsburg, Germany. HAIMER has designed, produced and sold innovative, high precision products for the metal cutting industry for nearly 40 years.

More than 350 of the 500 employees worldwide are working at HAIMER's sole production facility in Igenhausen in combination with the most modern of machines that utilize a high level of automation.

As the European market leader in the area of tool holding technology, with a daily capacity of approx. 2,000 tool holders, keeping the technological edge of the products is very important. Because of this, every year between 8 to 10% of the revenue is invested into research and development. The daily drive to be better perfectly fits with the corporate philosophy: **Quality Wins.**

HAIMER's product offering includes tool holders, balancing machines, shrink fit machines, 3D measuring devices and most recently also solid carbide end mills – all made in Igenhausen.

In order to make intensive tests on the HAIMER cutting tools and to develop the right milling strategy with the customers, HAIMER invested into a new Applications Center with three new DMG MORI blocking centers. On a HSC 70 linear, a DMU 80 P duoBLOCK and a DMC 1150 V, customer requirements out of various industries can be simulated and training as well as test-cuts can be carried out. With this investment the location Igenhausen has been extended to a Center of Excellence for Tool Holding & Milling.

Managing Director and President of the Haimer Group, Andreas Haimer, is excited about the partnership with DMG MORI: “It is a perfect synergy for the customer! High performance machine tools require high precision tool

holding technology, in order to transfer precision and power from the spindle to the cutting edge. The partnership is absolutely profitable for all parties.”

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Burnley BB11 5NA
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Tooling Technology



Shrinking Technology



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Tool Management



DMG MORI USED MACHINES

Immediately available –
More than 700 machines.



DMG MORI Used Machines is the world's largest dealer in used CNC machine tools. Our offer comprises certified DMG MORI Used Machines for all requirements and for every budget. For you this means a large selection, short delivery times and a comprehensive all-round service.

HIGHLIGHTS

- + Currently more than 700 available used machines in stock
- + Each machine is available for immediate delivery
- + Top quality guaranteed for all machines
- + Technologies for any requirement
- + Machines in all price categories
- + Convenient searching by type, year of construction, etc. in the online portal: www.cnc-scout.dmgmori.com

GET A QUICK QUOTATION

Whether a pre-owned or a showroom machine, DMG MORI Used Machines offers an unrivalled choice. Browse our online used machine marketplace at your leisure: www.cnc-scout.dmgmori.com

CERTIFIED TOP QUALITY

Before a DMG MORI pre-owned machine is deployed in your production, it passes through a rigorous and comprehensive test program.



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YOUR CONTACT

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ANFOTEC ANTRIEBSTECHNOLOGIE GMBH



Managing Director Christian Hast is impressed by the high quality in particular.



Four of nine high-tech machines were supplied by DMG MORI.

'Thanks to the immediate availability of the used machines, we were able to expand our production capacity in the shortest possible time.'

ANFOTEC Antriebstechnologie GmbH was founded in 2000 and has become established as a high-quality manufacturer of injection moulding machines including drive technology in the fields of mechanical engineering, measurement technology and semiconductor processing. ANFOTEC meets the high requirements on its production using **CNC technology from DMG MORI**. Four of the nine models – including a DMU 200 P and a DMF 260 – originated from the portfolio of DMG MORI Used Machines. Christian Hast, Managing Director of ANFOTEC, explains: **'We are aware of the longevity of**

the machines. That is why **used models are an attractive way** of expanding production capacity. New machining centres from DMG MORI are **equipped to be future-proof**. Used models also benefit from that', says Christian Hast. The performance therefore meets the quality standards of ANFOTEC – the company is certified to ISO 9001. He also sees the **rapid delivery** as a major advantage: 'Most of the products and services of DMG MORI Used Machines are suitable solutions that are in stock which, unlike new machine orders, can be **installed within the shortest possible time.**'

ANFOTEC
Antriebstechnologie GmbH

ANFOTEC Antriebstechnologie GmbH
Landwehr 17, D-59964 Medebach
www.anfotec.de



Eni lubricants and solutions
for high-tech metalworking

technology comes alive



Eni Refining & Marketing and Chemicals cutting fluids and industrial lubricants

Based on its long experience and certified research laboratories, Eni, leader in the Italian industrial lubricants market, has developed high tech metalworking products

- Aquamet - coolants
- Aster - mineral based neat cutting oils
- Metalcut - mineral based and vegetable biodegradable cutting oils

The partnership with DMG MORI calls for the use of Eni lubricants, greases and cutting oils on all group's machine tools and encourages the development of new technological solutions for improving the customer's production and manufacturing processes.

Eni Refining & Marketing and Chemicals commercial structure is available to identify the most suitable solutions for all lubrication needs in European countries.

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CONTROL TOWER FOR IMPROVED SUPPLY CHAIN TRANSPARENCY

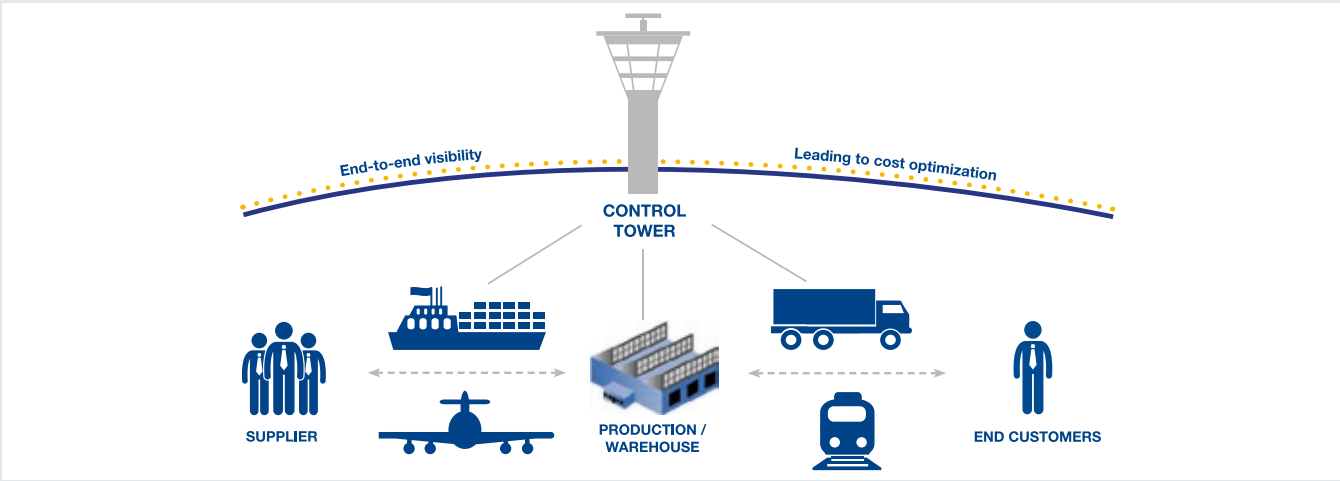
Control towers are a hotly debated subject in the logistics industry. Essentially, they serve to increase the transparency of complex supply chains in all fields of business.

Complex supply chains require quick, factual communication. This complexity is brought about by **intercontinental or global supply chains**, major dependencies, a high degree of outsourcing in connection with **supply chain activities** and difficult requirements on the part of the customer. The more complex the supply chain, the greater the **benefit** for the customer. If all relevant data can be pooled at an **information node** and evaluated, companies with fragmented supply chains in particular will benefit from the concept of a **Control Tower**. This is because it sheds light on key information such as **delivery date and status, fluctuations in usage and raw material supply**, to name but a few aspects.

Modular and scalable

A **Control Tower** can be scaled to suit your requirements. However, a holistic focus on a **Control Tower** is only wise in the fields of **3PL and 4PL** (third-party logistics provider with its own assets and fourth-party logistics provider without its own assets) if, in particular, **supply chains** with different routes and requirements have to be merged. A **Control Tower** can also be **modular** and used to monitor invoices (audit & pay), for example, or even

evaluate suppliers. In order for everyday business to continue uninterrupted, a **Control Tower** should be implemented across several phases and its focus should be balanced. Its focus can range from the basic services of a logistical service provider, the **additional services of a 3PL company and the services of an LLP** (lead logistics provider; a combination of 3PL and 4PL skills, e.g. with its own HGVs and warehouses as well as the expertise required to manage complex supply chains) to a **4PL** company, which **coordinates the logistical processes of a company** without contributing its own assets. Be it a medium-sized company or group, if the **outsourcing of logistical processes** is a relevant issue then a **Control Tower** is a sensible option. **Gondrand | ATEGE** already has Control Tower solutions in place for **DMG MORI**, namely for the procurement and distribution logistics in **Seebach** and for the **distribution logistics in Bielefeld**. We are focusing on concentrating our processes on one **logistical service provider which renders its services from a single source**. Streamlined management structures are favourable even with Control Tower solutions. Additional Control Tower concepts are currently in development for **DMG MORI** in order to sustainably spur on the **optimisation of its supply chain**.



We have found the greatest room for improvement in the fields of **production efficiency, supply chain transparency, logistical service monitoring and transportation cost control**. The **optimisation of logistical processes** and the pooling of logistical activities between **DMG MORI** and **Gondrand | ATEGE** has enormous potential to benefit everyone involved, from the supplier to the end customer.

DMG MORI

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Finanzgruppe



LEGAL INFORMATION: JOURNAL – DMG MORI ——— Journal for customers and interested readers. Publisher and responsible for the contents: DMG MORI Europe Holding AG (Winterthur, Switzerland). Concept, design, organisation and photos: Montfort Werbung AG, FL-9491 Ruggell. Circulation: 600,000 copies. All prices stated in this Journal are based on German list prices (EUR plus packaging, transport and VAT) and may therefore deviate in other countries or be subject to local exchange rate fluctuations. Prices subject to change, subject to technical changes, availability and prior sale. Our General Terms and Conditions apply.

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