

Mikron

VCP 800W Duro

VCP 1000 Duro

UCP 800 Duro



GF Machining Solutions: all about you

When all you need is everything, it's good to know that there is one company that you can count on to deliver complete solutions and services. From world-class Milling, electrical discharge machines (EDM) and Laser texturing machine tools through to first-class Automation, Tooling and software systems—all backed by unrivaled Customer service and support—we, through our Mikron, Liechti, AgieCharmilles and System 3R technologies help you raise your game and increase your competitive edge.



Swiss design and quality

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GF Machining Solutions

Invest in the future

With a Mikron VCP 800W Duro, Mikron VCP 1000 Duro or a Mikron UCP 800 Duro, you obtain a high-performance machining centre with a steadfast and heavy polymer concrete base, generously dimensioned linear guides, massive recirculating ball screws and strong feed drives, state-of-the-art control and powerful motor spindles.

This guarantees the stability of its value for the entire life of the machine.

GF Machining Solutions.

Swiss precision

Bases for precision during the whole life of the machine

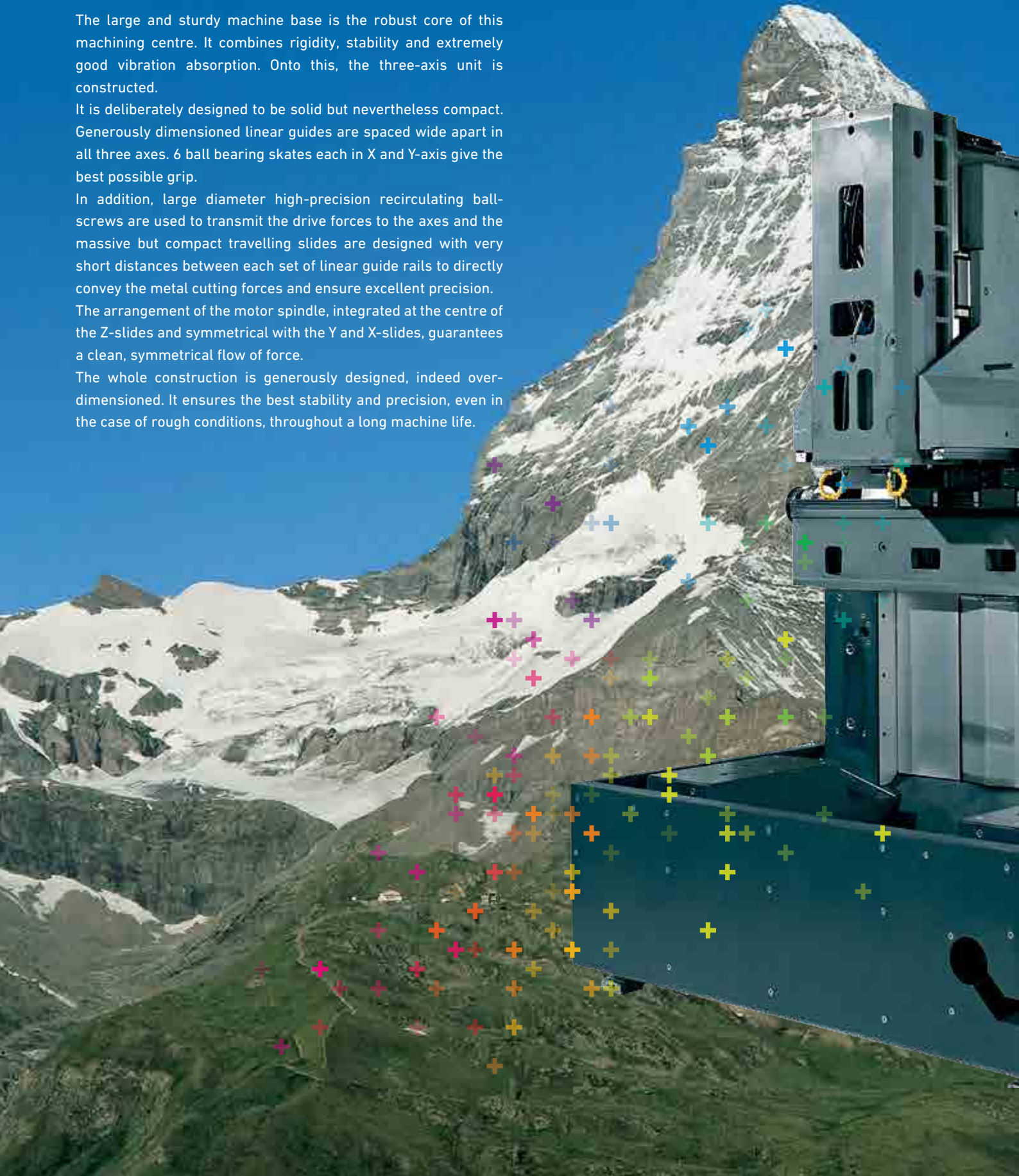
The large and sturdy machine base is the robust core of this machining centre. It combines rigidity, stability and extremely good vibration absorption. Onto this, the three-axis unit is constructed.

It is deliberately designed to be solid but nevertheless compact. Generously dimensioned linear guides are spaced wide apart in all three axes. 6 ball bearing skates each in X and Y-axis give the best possible grip.

In addition, large diameter high-precision recirculating ball-screws are used to transmit the drive forces to the axes and the massive but compact travelling slides are designed with very short distances between each set of linear guide rails to directly convey the metal cutting forces and ensure excellent precision.

The arrangement of the motor spindle, integrated at the centre of the Z-slides and symmetrical with the Y and X-slides, guarantees a clean, symmetrical flow of force.

The whole construction is generously designed, indeed over-dimensioned. It ensures the best stability and precision, even in the case of rough conditions, throughout a long machine life.





Every machining centre has been assembled in our air-conditioned assembly shops by qualified personnel, measured by means of a laser and submitted to extensive tests before delivery.



Generously dimensioned

High-precision, widely spaced linear guides in all three axes, six roller-bearing skates each in X and Y-axes, as well as four in the Z-axis give the best rigidity and robustness.



Reliable tool changer

The reliable pick-up system with fixed space coding and forced controlled feed movement is arranged to be both well-protected and space-saving at the centre of the column. It has simple and readily accessible loading from the rear.

Where chips fly

The metal chips fall through the spacious opening under the worktable directly into the scraper chip conveyer. It is designed to transport a large volume of chips. The coolant pump is integrated into the coolant tank.



High-performance in 3-axis



Mikron VCP 800W Duro

A three or four-axis high-performance machining centre. Thanks to the construction with the travel movements in the tool and a stationary worktable, there are constant mass ratios for the dynamics and acceleration. The Mikron VCP 800W Duro is suitable for work ranging from powerful roughing to dynamic lining and finishing tasks on free form surfaces. It is designed to finish large and also heavy work-pieces economically.

Mikron VCP 1000 Duro

A three or four-axis high-performance machining centre. In addition to all the advantages of the Mikron VCP 800W Duro, the Mikron VCP 1000 Duro has 200mm additional travel in the X axis. Thanks to the longer worktable many alternative set-ups are possible, such as, double or multiple work-piece clamping, use of dividing heads when working with long components and much more.

Chip conveyers with coolant tanks and pumps are supplied as standard. For more complex requirements, internal through spindle coolant or minimum quantity air mist lubrication options are also available.





Safe and clean

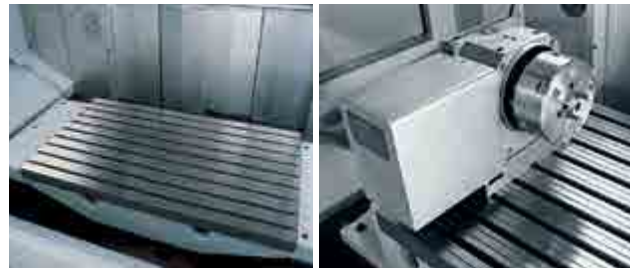
Whether using a perimeter guard or a complete machine enclosure, both offer full operator convenience: Front sliding doors with a wide opening ensure very good access to the working area for crane loading and setup operation. A manually opened window for side access to the working area is also available as an option. Large panes made of safety glass as well as the powerful interior lighting are standard.

Worktables adapted to your needs

The massive machine base and the modular construction make the Mikron VCP 800W Duro and the Mikron VCP 1000 Duro versatile machining centres. They can be perfectly adapted to the most varied production tasks. The massive mounting surfaces on the polymer concrete base make it possible to equip it with various worktables with large clamping surfaces, solutions based on customer requirements are also possible. As the worktable remains stationary the machine dynamics are not influenced, even in the case of a high workpiece weight.



Standard table for workpieces up to 1.6 t. It is available in two different lengths: 900mm and 1300mm (for VCP 1000 Duro) x 600mm width. These flat tables have 9 T-slots for the secure clamping of workpieces suitable for the large working area.



The lower table option brings 150mm more Z height for optimum machining conditions for large and bulky workpieces, or in connection with a dividing head.

The dividing head can be set up on any of the flat tables.

Automatic tool length and diameter measurement, as well as a tool geometry check by means of a laser or tool probe. The values are transmitted to the tool management independently.



Offers autonomous recording of the workpiece zero point and determining of the location, as well as workpiece plotting by means of the set-up probe.



Simultaneous in 5-axis



Mikron UCP 800 Duro

A five-axis high-performance machining centre, that is also capable of heavy metal removal. The generously dimensioned round swivel table is fitted directly on the massive mounting surfaces of the polymer concrete base.

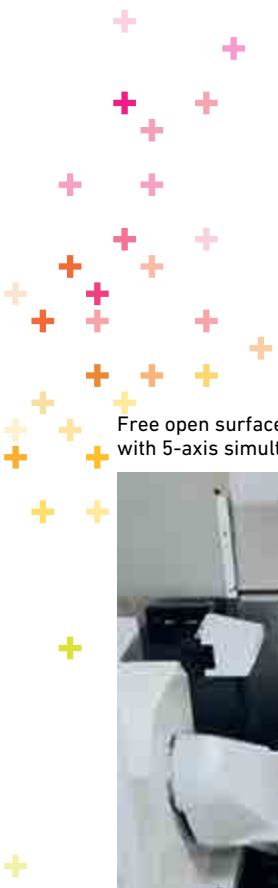
Thanks to the construction with the travel movements by the tool and the rotation and swivel axis in the table, there are constant mass ratios for the dynamics and acceleration. The Mikron UCP 800 Duro is as well suited for 5-axis simultaneous machining work as it is for 5-sided machining operations. Thanks to its great clamping force on the rotation and swivel axis, it is also suitable for heavy 3-axis machining jobs in regulated operations. The round swivel table is optimally matched to the basic machine from its size, its carrying capacity and its dynamics. Thus 3, 4 and even 5-axis machining jobs are possible, from powerful roughing to accurate finishing work on free form surfaces. The Mikron UCP 800 Duro is designed to be able to finish large and heavy workpieces economically.



Side window opening, even if the table is swivelled far into the plus range, nothing remains concealed.

The Rotoclear option enables you to keep a clear view, even when large quantities of coolant are being used.





Free open surfaces on medium and large forging dies can be milled with 5-axis simultaneous machining



Swivel range from -100 to +120 enables optimum accessibility with the tool, especially for operations such as undercutting.

Example of a 5-side machining in regulated operation



Example for 5-axis simultaneous machining

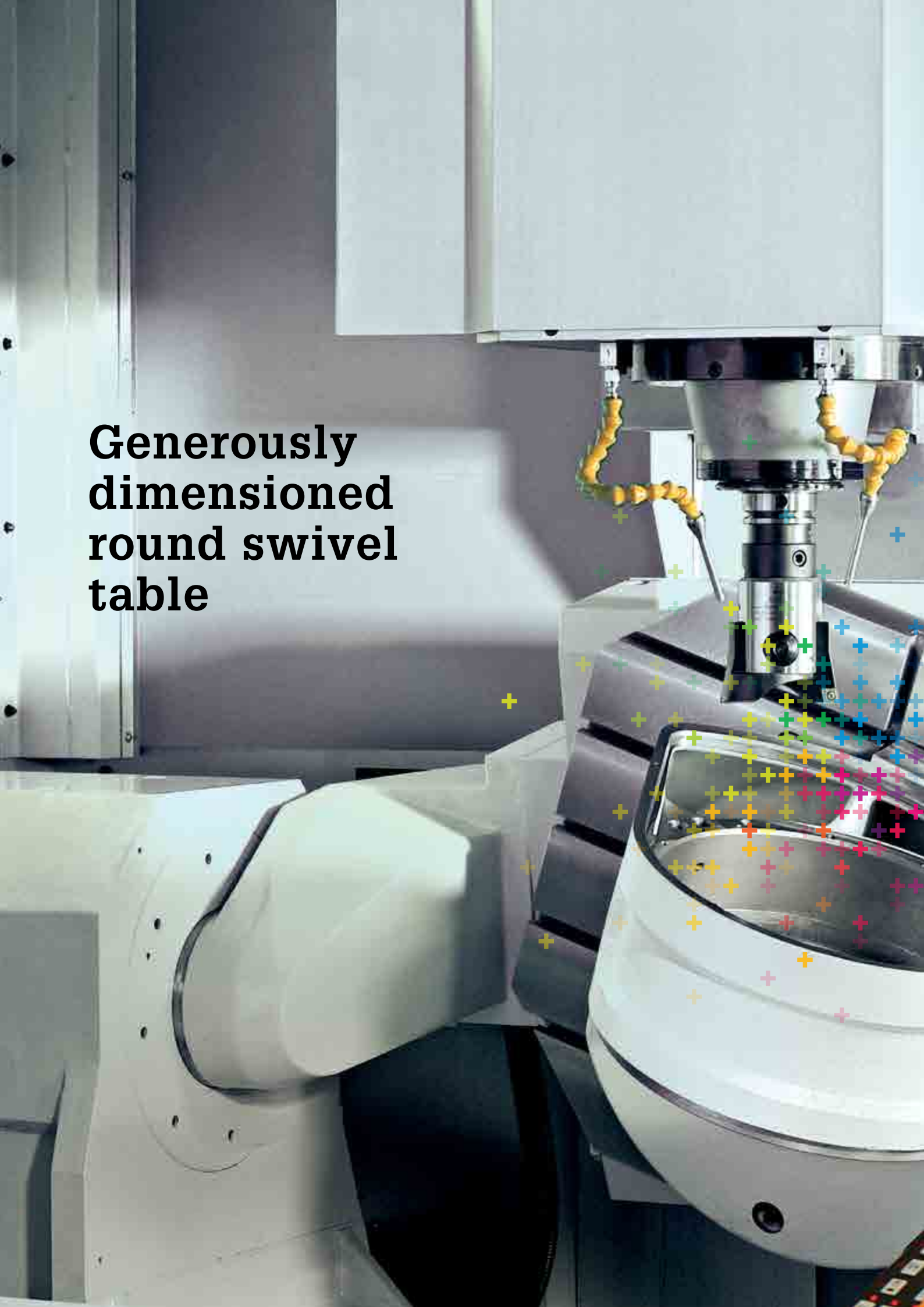


Example for combined 5-side machining and 5-axis simultaneous machining



Access for crane loading and unloading is built in. The roof of the complete machine enclosure opens simultaneously with the sliding doors.

**Generously
dimensioned
round swivel
table**





Core component

High-tech spindles

Step-Tec

At Step-Tec the motor spindle technique is the core competence. This extremely efficient division develops high-tech spindle systems and manufactures a complete range of motor spindles and their supply units.

Close cooperation between research facilities and the in-house development department ensures innovative solutions to problems and short lead times. To this end, Step-Tec has high quality measurement and testing equipment available for spindles and spindle systems, to test thoroughly the reliability and precision of the end product.

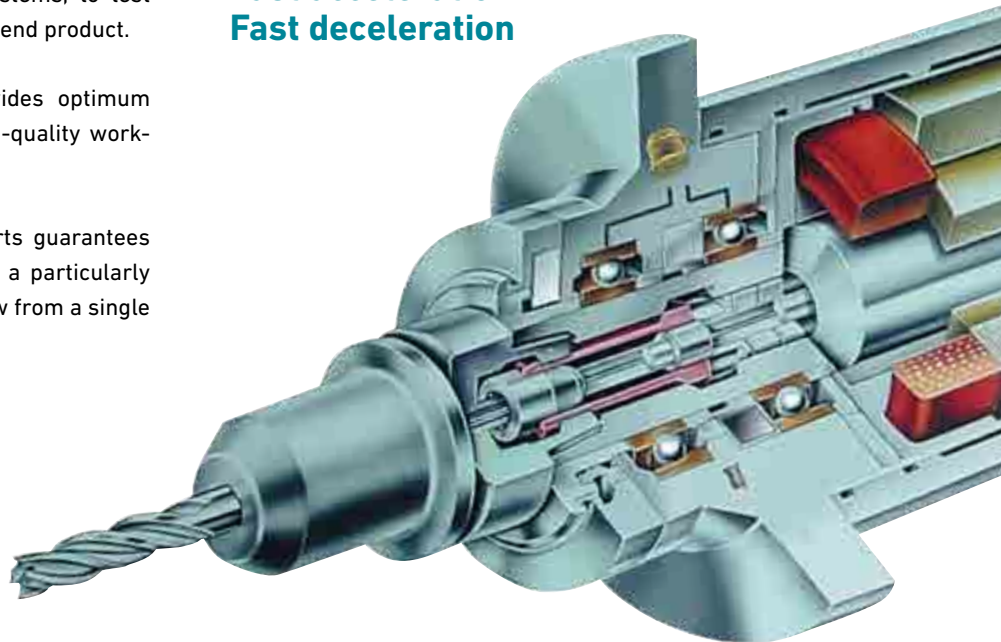
The spindle with its hybrid bearings provides optimum conditions for economical machining of high-quality work-pieces.

Close cooperation with the machining experts guarantees users sophisticated spindle technology with a particularly high level of practicality: machining know-how from a single source.

Vector controlled

In vector control, mathematical transformation is used to superimpose the electrical magnitude of asynchronous equipment upon a model of direct current technology.

High torque at low revs
Fast acceleration
Fast deceleration



The latest generation of spindle testing equipment.



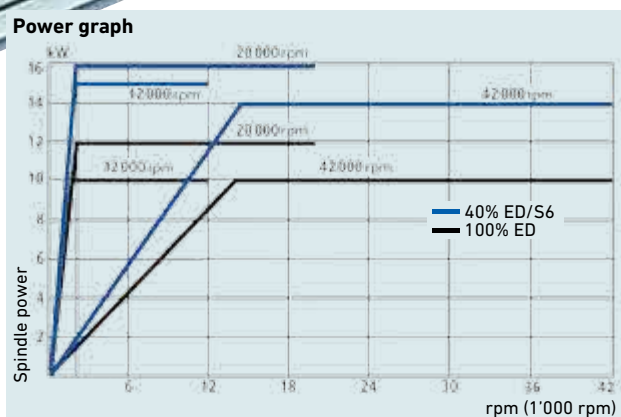
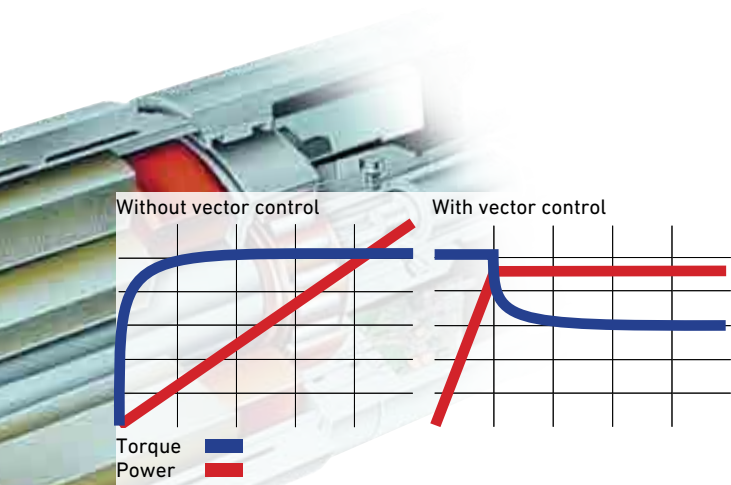
Clinically clean and precise: flexible assembly of small batches of spindles. Three-quarters of all spindle components are manufactured in-house.





Powerful high-performance spindles

Whatever machine configuration you choose, with a Mikron Duro machine you obtain state-of-the-art motor spindle technology: vector regulation, a highly stable spindle bearing and spindle casing cooling for constant temperatures during the entire working time.



Machining performance which is second to none				
Spindle	rpm	12 000	20 000	42 000
Material		Ck45	Ck45	Aluminum
Thread cutting up to		M24	M24	M8
Machining				
Spindle speeds	rpm	2500	2500	
Tool diameter	mm	63	63	16
Chip volume	cm ³ /min	710	605	>1000
Steel 52 HRC	cm ³ /min			480
Drilling into solid material				
Spindle speeds	rpm	1200	1200	
Tool diameter	mm	54	50	

12 000 min⁻¹

for traditional tool technologies and programming:

- + Spindle taper ISO 40
- + Infinitely variable speed range – no drop in performance
- + Preparable with internal coolant supply for use in production
- + Run-up and braking time: 1 second each
- + Ceramic-hybrid bearing
- + Lifetime lubrication

20 000 min⁻¹

for machining the most varied materials with strategies from HSC technology:

- + Spindle taper HSK 63
- + Great feed forces
- + Infinitely variable speed range – no drop in performance
- + Planar arrangement of the tool taper – better rotation
- + Preparable with internal coolant supply for use in production
- + Ceramic-hybrid bearing with oil mist lubrication

42 000 min⁻¹

The alternative to the HSC machine: In combination with control systems, this high-speed spindle will allow you to enter into HSC machining.

Special HSC tool technologies are:

- + Spindle taper HSK 40
- + Finely balanced three-phase motors
- + Specific tool holding fixtures for extremely exact work
- + Optimal rotation thanks to the facing stop of the tool holder
- + Ceramic-hybrid bearing with oil mist lubrication

State-of-the-art control, workshop-oriented programming



Man-machine interface: easy to operate, modern control

Digital control Heidenhain

The digital Heidenhain iTNC 530 control system is of the latest generation and has a clearly structured operating panel which turns the Mikron VCP 800W Duro, the Mikron VCP 1000 Duro and the Mikron UCP 800 Duro into reliable, operator-friendly, high-performance machining centres:

- + Simple, dialog-controlled programming, parallel programming
- + Free contour programming, freely definable subroutine programming, including process certainty
- + Short training and reliable operation of predefined working cycles
- + If required, the optional electronic handwheel brings you close to the machining point

Safety for the employees

All safety requirements meet the CE standards. These include, of course, the lowering lock in Z-axis, the collision protection (regulated by means of motor overload), multilayer special glass with high breakage protection and emergency off switch.

Options to increase efficiency and variability:

- + Table probe system TS 27
- + Laser measurement of the tools
- + Set-up probe
- + Dividing heads
- + Openable viewing window
- + Rotoclear
- + Oil mist spray cooling
- + Hand wash-down facility
- + Graphite dust extraction



GF Machining Solutions - a strong partner!

GF Machining Solutions not only offers quality machines, but also first-class after-sales support

You receive advice before and after the sale

Technology support

With our outstandingly well-trained staff, they are in a position to offer metal-cutting answers from test-cut to turn-key solutions.

User training

In order to achieve the best results on the most modern machines, qualified staff are required.

GF Machining Solutions offers a solution here too. You can have your employees trained as specialists.

Hot Line

The objective of this service is the practical support of users in the solution of problems occurring in everyday work in the workshop.

Customer Service

Therefore our well-trained service technicians are quickly available and get every problem under control.

Here too, we attach importance to the fact that professionals are at work.



Technical data

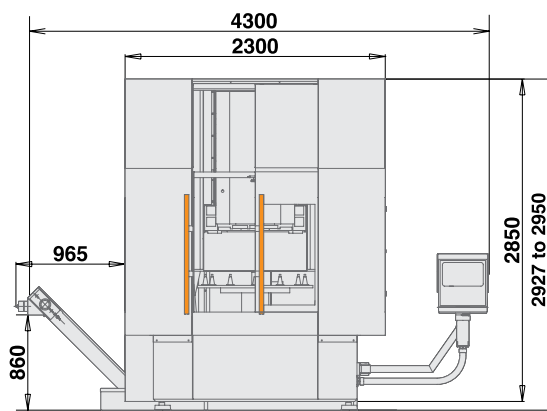
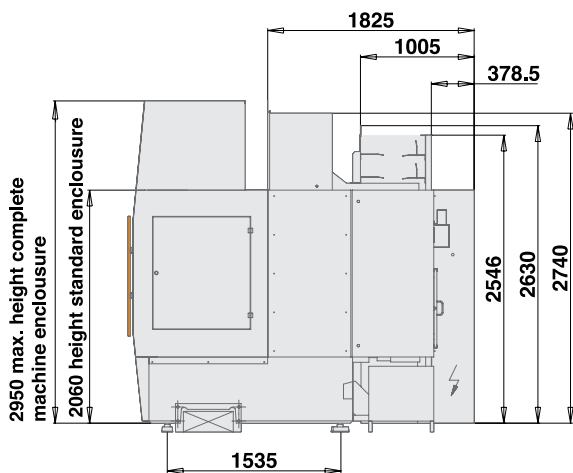


Machine type		Mikron VCP 800W Duro	Mikron VCP 1000 Duro	Mikron UCP 800 Duro
Work area¹				
Longitudinal	X mm	800	1000	800
Lateral	Y mm	650	650	650
Vertical	Z mm	500	500	500
High-performance motorspindle				
Maximum rpm	rpm	12/20'000	12/20'000	12/20'000
Spindle performance at 40% ED/ S6	kW	15/16	15/16	15/16
Toolholder interface		ISO 40 / HSK E63	ISO 40 / HSK E63	ISO 40 / HSK E63
HSC motorspindle				
Maximum rpm	rpm	42'000	42'000	42'000
Spindle performance at 40% ED/ S6	kW	14	14	14
Toolholder interface		HSK E40	HSK E40	HSK E40
Feed drives				
Rapide traverse	m/min	30	30	30
Feed force X and Y/Z	N	7000/9000	7000/9000	7000/9000
Tool changer				
Magazine tool capacity for 12/20000	No.	30	30	30
Magazine tool capacity for 42000	No.	36	36	36
Max. tool diameter for 12/20000	mm	90	90	40 (90)
Max. tool diameter for 42000	mm	16	16	16
Max. tool length for 12/20000	mm	300	300	250 (160)
Max. tool length for 42000	mm	100	100	100
Max. tool weight for 12/20000	kg	8	8	8
Max. tool weight for 42000	kg	1,5	1,5	1,5
Tool change time	sec	8–9	8–9	8–9
Chip-tochip times to VDI	sec	12	12	12
Quality data				
Positional tolerance DIN/ISO 230-2/97	µm	8	8	8
Systems				
Type	Heidenhain	iTNC 530	iTNC 530	iTNC 530
No. of axes	5 + spindle	+	+	+
Linear interpolation	5 of 5 axes	+	+	+
Circular interpolation	2 of 5 axes	+	+	+
Safety equipment				
Machine enclosure/complete machine enclosure		+	+	+
Door opening to the front	mm	1040	1040	1040
Window opening to the side	mm	845 x 977	845 x 977	845 x 977
Coolant/Swarf removal				
Scraper chip conveyor 140l		+	+	+
Coolant flow	30l/min - 2bar	+	+	+
Internal through spindle coolant	18, 40 or 70bar	Option	Option	Option
Weight				
Approx. machine weight	kg	9'330	9'850	10'350
Transport dimensions	mm	3200 x 2400 x 2900	3200 x 2400 x 2900	3200 x 2400 x 2900

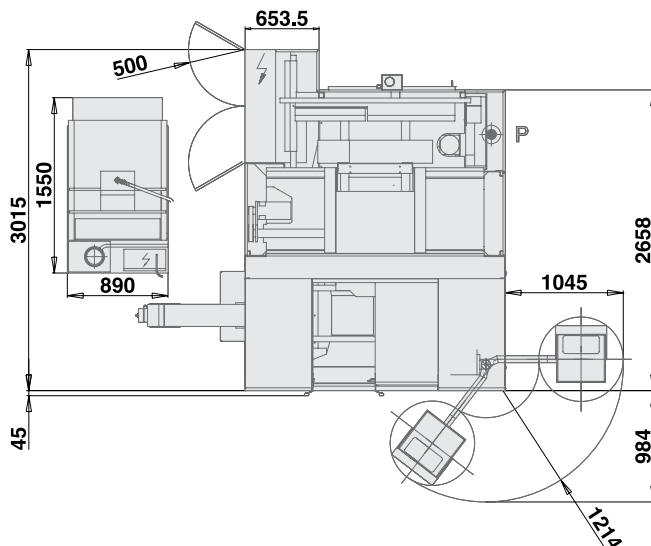
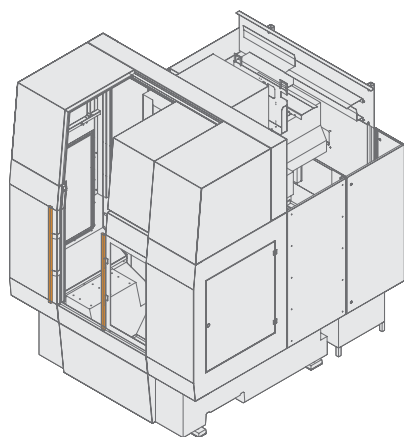
¹ detailed information concerning the workpiece dimensions may be obtained from the workspace drawing

Machine type		Mikron VCP 800W Duro	Mikron VCP 1000 Duro	Mikron UCP 800 Duro
Accessories				
Cooling system with chip conveyor and filter (TTC)	580 l –18,40 or 70 bar	+	+	+
Handwashing facilities		+	+	+
Oil-mist extraction		+	+	+
MP 12 setup probe		+	+	+
Tool measurement TS 27 / Laser		+	+	+
Oil-mist coolant spray unit		+	+	+
Dividing head		+	+	-
Graphite dust extraction		+	+	+
Connection data				
Effective power	kW	16	16	16
Total power requirements	kVA	44	44	44
Fuse protection	A	35	35	35
Line voltage/Frequency	3 x 400 V– 50/60 Hz	+	+	+
Connection cross section	mm ²	6	6	6
Control voltage	VDC	24	24	24
Pneumatic connection	200 l/min–6 bar	+	+	+
Connection diameter	mm	12	12	12
Work tables				
Table surfaces area	mm	900 x 600	1'300 x 600	600 x 600
Table load	kg	1'600	1'600	500 (1'000 ²)
Clamping slots		14–H12 (H7)	14–H12 (H7)	14–H12 (H7)
Distance slot to slot	mm	63	65	100
Tilt range	°	-	-	-100 up to 120
Tilt speed (30% ED)	rpm	-	-	15
Rotary speed (time)	rpm	-	-	20

² 1000kg in positioning mode 3+2 axis machining



leveling pads 77-100 mm



GF Machining Solutions



EDM (electrical discharge machining)

AgieCharmilles wire-cutting, die-sinking and hole-drilling machines.

For over 60 years we have been at the forefront of every EDM development: designing and refining the EDM process and building machine tools that deliver peerless part accuracies, surface finishes, cutting speeds and process reliability. Today, our AgieCharmilles wire-cutting, die-sinking and hole-drilling machines are recognized throughout the world as the best in the business. Our continuous research and development in digital generator technology, control systems and integrated Automation systems are evidence of our commitment to keeping your EDM operations on the leading edge of technology.



Laser

AgieCharmilles Laser texturing machines.

Laser texturing is a fully-digitized surface engineering process that has huge potential. The technology enables precise 2D and 3D textures or engravings to be machined accurately and directly onto complex parts or molds to improve and alter their aesthetic appeal, functionality and performance. The process is infinitely repeatable and offers many distinct environmental and economic advantages over conventional texturing processes.

Laser Additive Manufacturing (AM).

GF Machining Solutions has partnered with EOS, the global leader for high-end AM solutions, to integrate this innovative technology and further develop it into its current solutions to fully benefit the mold industry, by focusing on injection efficiency: optimized cooling design to reduce cycle time, lower energy consumption, higher quality of plastic parts.



Automation

System 3R Automation, Tooling and software.

Productivity is the key to manufacturing success, and automating a manufacturing process is a proven method of increasing its efficiency, effectiveness, quality and reliability. System 3R's integrated Automation, Tooling and software solutions—simple workpiece pallet and electrode changers and flexible manufacturing and robot handling systems— increase your competitive advantage.



Milling

Mikron high-speed (HSM), high-performance (HPM) and high-efficiency (HEM) Milling centers.

Customers operating in the mold, tool and die and precision component manufacturing sectors stake their reputations on being able to quickly and cost-competitively meet their customers' demands. That's why they invest in Mikron machines. Incorporating the latest and most advanced technologies and premium-performance components, Mikron HSM, HPM and HEM machines help you increase your production capabilities and improve your productivity. Designed and built for speed, accuracy and reliability, the machines, like you, are proven performers.

Liechti Dedicated Aerospace and Energy machining Centers.

Aerospace and power generation turbine manufacturers increasingly turn to Liechti dedicated five- and six-axis machining centers to machine complex, high-precision airfoils on blades, disks, blisks, blisks/IBRs and impellers. It's easy to see why because these machines, with their specific profile machining technology, specialized CAD/CAM software and engineering competence for ultra-dynamic machining in titanium, Inconel, nimonic, titanium-aluminide and high-alloy steels, yield productivity gains as much as 30 percent, thanks to reduced machining times. In the globally competitive aerospace and power generation manufacturing sector, that's definitely worth shouting about.

Step-Tec Spindles.

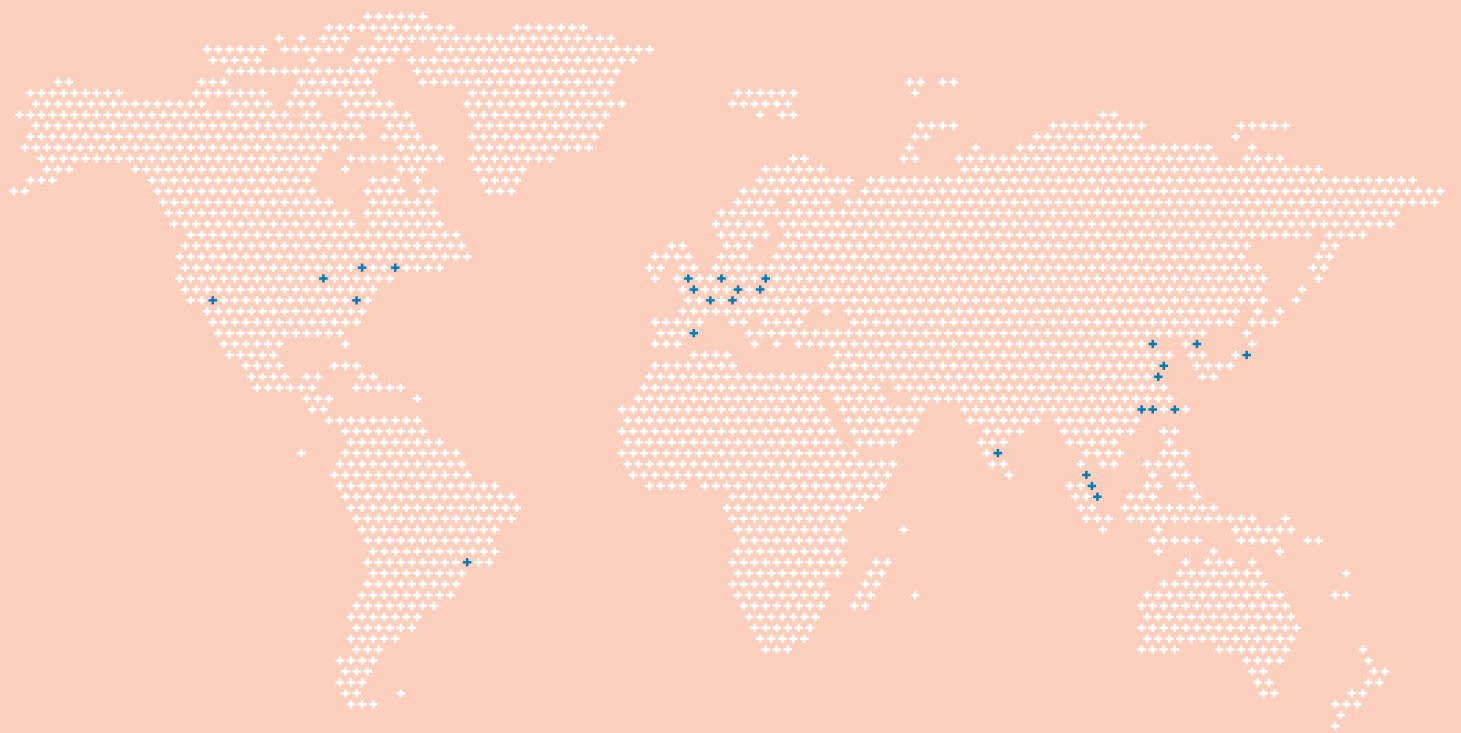
At the heart of every Mikron machining center is high-performance Step-Tec Spindle. Step-Tec Spindles are essential core components of our machining centers. Highly accurate and thermally stable Step-Tec Spindles ensure that our machines can handle everything from heavy-duty roughing to fine-finishing operations.



Customer Services

Operations Support, Machine Support and Business Support.

To help you get the most and the best from your machine tools and equipment, we offer three levels of support. Operations Support covers our range of original wear parts and certified consumables (EDM wires, filters, resins, electrodes etc.) to ensure that your machines are performing at the highest levels. Machine Support maximizes, through our best-in-class technical support, preventive services and quality spare parts, your machine tool uptime. Business Support is designed to help you make a real step-change in your productivity and performance with solutions tailored to your specific needs.



At a glance

We enable our customers to run their businesses efficiently and effectively by offering innovative Milling, EDM, Laser, Spindle, Automation and Tooling solutions. A comprehensive package of Customer Services completes our proposition.

www.gfms.com



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