COMPACT LINE

The versatile solution
for indexable inserts

Key parameters

The COMPACT LINE offers maximum grinding performance with the smallest possible footprint. In production and/or regrinding operations, it grinds indexable inserts made of carbide, cermet, ceramic or PCB/PCD. Depending on the clamping system, the minimum inscribed circle diameter is 4 mm for the pin clamping system and 3 mm for the indexable insert clamping system.

EWAG


Grinding


Eroding


Laser


Measuring


Software


Customer Care

EWAG

The origins of EWAG date back to 1946 when the company manufactured precision tool grinding machines for the Swiss watch industry. Today the EWAG product range includes a CNC tool grinding machine for grinding inserts as well as laser machines for indexable cutting inserts and rotationally symmetrical tools made from hard and ultrahard materials such as carbide CBN or PCD.

EWAG belongs to the UNITED GRINDING Group. Together with our sister company, Walter Maschinenbau GmbH, we consider ourselves to be a supplier of systems and solutions for the complete machining of tools and can offer a wide range of products, including grinding, rotary eroding, laser machining, measurement and software.

Our customer focus and our global sales and service network of company owned locations and employees has been appreciated by our customers for decades.

COMPACT LINE

The COMPACT LINE with up to 6 CNC axes is the tool grinding machine for indexable inserts for grooving, milling, turning and profiling applications. A wide range of clamping systems which are docked within the machine via a plug & play interface offer total freedom in the choice of tools, their sequence and the batch size. Thanks to extremely short set-up times, even very small batches can be economically produced.


Grinding


Software

The COMPACT LINE at a glance

Application

- Production of indexable inserts
- Indexable inserts: from 3 mm inscribed circle to 50 mm circumscribed circle diameter
- 1.6 mm to 10 mm diameter, nail clamping system
- Materials include HSS, carbide, cermet, ceramic, CBN, PCD

The machine

- 6-axis CNC grinding machine
- Compact design
- Low-vibration grey cast iron machine base
- Linear axes X, Y, Z with glass scales
- Rotary axes A, B with torque direct drives
- C axis clamping brace (option)
- FANUC control, the global standard
- Various clamping systems for securely fixing tools
- "Three in One" sharpening unit for dressing, regenerating, crushing
- 6-axis FANUC robot for automatic loading
- Pallet changer with up to 8 pallets

COMPACT LINE – flexible grinding performance in the smallest footprint, with integrated 6-axis FANUC robot.

Software

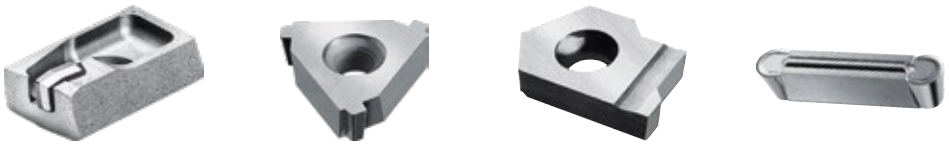
- ProGrind grinding software
- Input screens with 3D graphics and easy programming
- Human machine interface (HMI) for real-time information
- CyberGrinding 3D simulation
- Pressure grinding module
- Crushing module

Flexible peripheral grinding, thanks to the new 6-axis kinematics
With new, high-performance technology, COMPACT LINE sets a new standard in the flexible machining of indexable inserts. As a result of the newly developed optional C axis, the machine is now also optimally equipped for flexible and efficient peripheral grinding and grinding the K-land protective chamfers.

Downtimes are practically eliminated thanks to the smart integration of the in-process measurement system. Dimensional fluctuations of the sintered insert blank can be efficiently measured and subsequently compensated for.

Ergonomics at the highest standard

1



1 Close-up view of machine interior

The ergonomic concept of the COMPACT LINE instantly turns the operator into a pro for indexable inserts of varying geometry. All operating elements are ergonomically laid out within the reach of the operator.

Tool examples:
Ground on the COMPACT LINE

Modules for dynamic grinding performance

- Automatic clamping systems
- Rapid wheel change
- 3D tool measuring

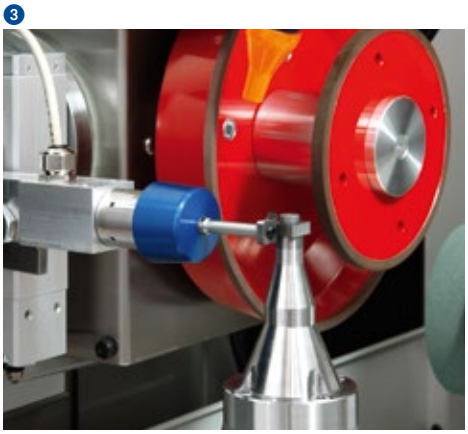
1

2

Pin clamping system
The ideal system for complete machining. The indexable inserts are fixed using a tension pin, enabling free access from all sides.

3D tool measuring
Tools are measured in the production process using an integrated measuring probe. Impermissible tolerances are automatically compensated. The same is true of the clamping position.

3



Grinding wheel change with HSK-E 50
The HSK-E 50 automatic grinding wheel interface clamps the wheel package with great precision. Wheel changing times are reduced to a minimum.

1 Pin clamping system

2 Grinding wheel change with HSK-E 50

3 3D tool measuring, measuring probe

1

Compact interior
In the COMPACT LINE, all grinding movements are performed around the working axis B. Short axis paths support the high grinding precision with short interpolation travel and reduced downtimes.

Automatic clamping systems on the B axis
The Plug & Play systems are mounted in exactly the same way on the B-axis, thus enabling them to be exchanged quickly. The result is the highest level of reliability and minimal change-over times.

1 Compact interior/clamping systems on the B axis

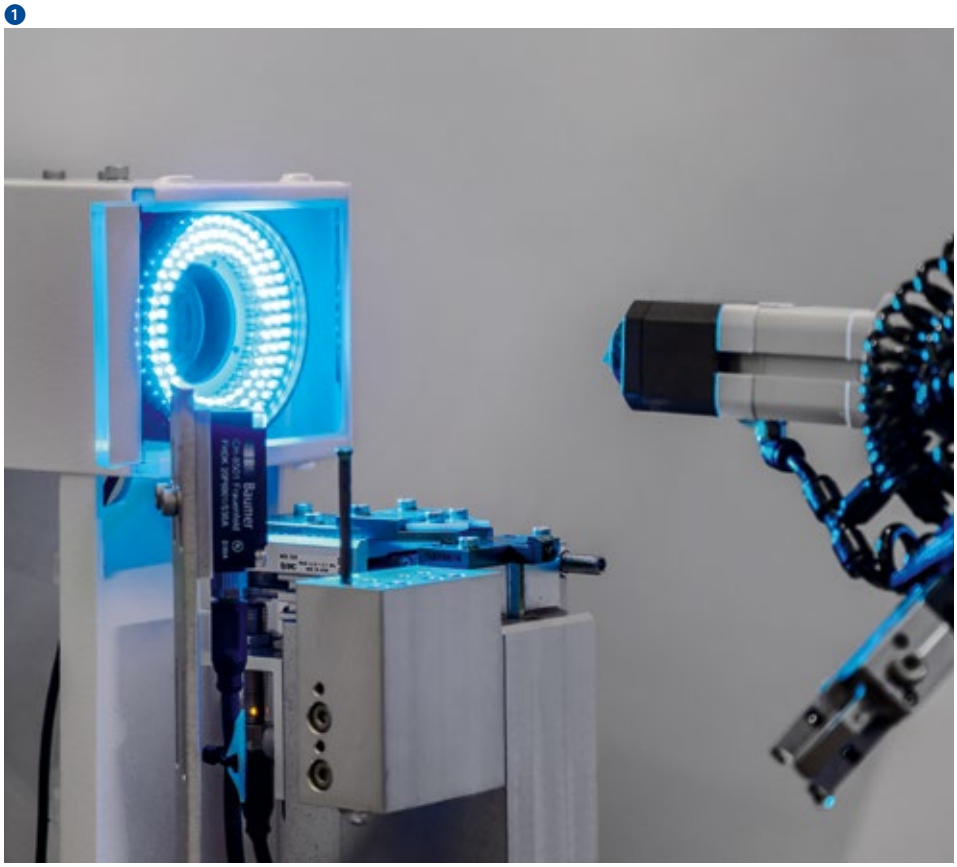
Precision and productivity in multi-shift operation

1

Flexible automation
An integrated 6-axis FANUC robot considerably accelerates the machining cycle with automatic loading and unloading of tools. In this process, the indexable insert is directly transferred from the robot gripper to the automatic clamping system. The indexable insert is guided into the borehole of the clamping system using the pin, resulting in the precise guiding and alignment of the tool for the most economical grinding process.

1 FANUC robot with 3x gripper

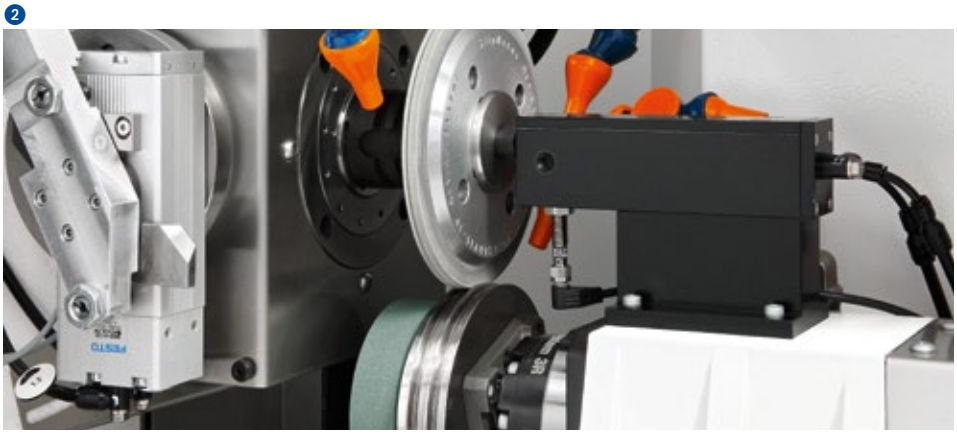
1



Vision System CCD-HD
The highly efficient vision system enables loading from grid pallets using a magnetic gripper. The system is used for perfect part alignment and for detecting the smallest of sintering imperfect. The result is a consistently uniform loading into the loading prism and thus a further enhancement of process reliability.

- Highly efficient Vision system
- "Three in One" sharpening unit
- 6-axis robot
- Pallet changer

2



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"Three in One" – dressing, regenerating and crushing
The "Three in One" sharpening unit ensures consistently perfect grinding wheels: Dressing, regenerating or crushing is carried out automatically, depending on the grinding application. Of significance to profile wheels here is the crushing process, in which the target profile is imprinted on the grinding wheel with a profiled steel roll (crushing roll). One module in the ProGrind grinding software controls the axis feed rate by evaluating the current force between the crushing roll and the grinding wheel, and matches this to the machine feed rate. The maximum load of the machine axes is monitored throughout the process, and the highest form quality applied to the grinding wheel. This results in a major boost to the precision and economy for efficiently grinding profile inserts.

Pallet changer
A sufficiently large tool magazine is essential for minimally-manned multi-shift operation. Two standard pallets can be held in the robot cell, increasing to eight with the pallet loader option which ensures the greatest autonomy in the COMPACT LINE.

1 Vision System CCD-HD
2 "Three-in-One" – Long-life grinding precision
3 Pallet changer

EWAG ProGrind grinding software with CyberGrinding plug-in

ProGrind – more than just software!
Innovation demands innovative software. As customer-centric software from EWAG, ProGrind meets all your exacting demands. Programs can be created quickly and easily on all EWAG CNC machines with ProGrind. The input screens feature 3D graphics. The machines can be integrated within your company network via Ethernet. At the same time, our specialists have access for diagnostic and maintenance purposes.

EWAG standard application framework

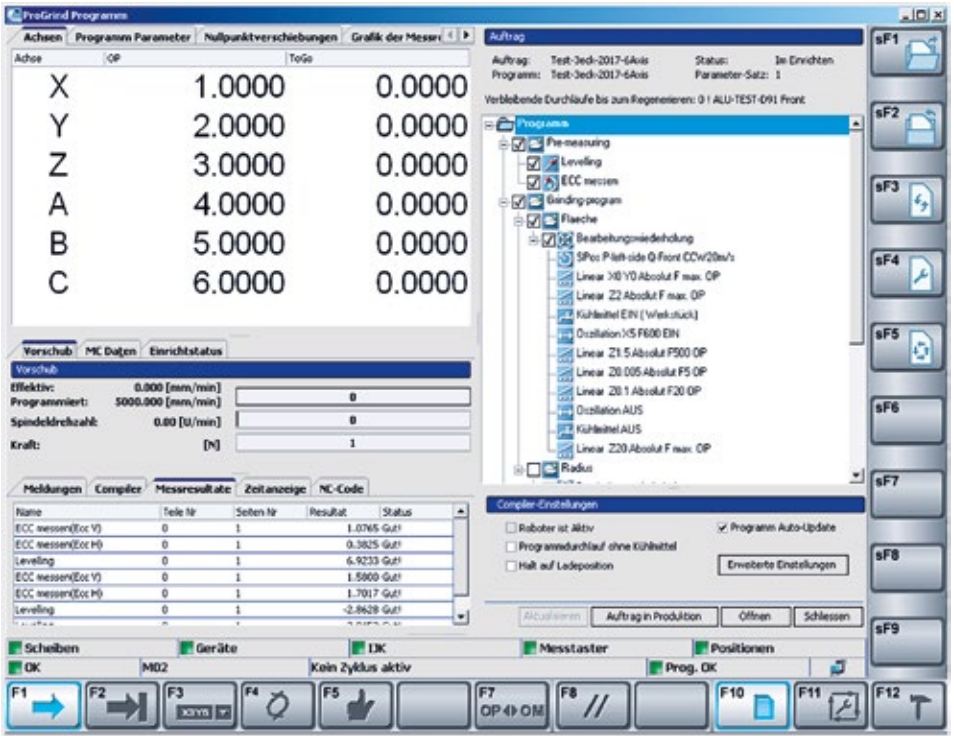
- Human Machine Interface (HMI)
- Wheels administration
- Production
- CNC programming
- Hardware
- Job management

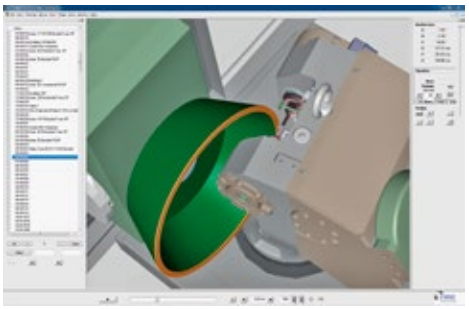
COMPACT LINE
ProGrind grinding software with CyberGrinding plug-in

LASER LINE ULTRA **LASER LINE PRECISION**

LaserSoft laser software with LaserPro 3D plug-in

Human machine interface (HMI)
The HMI contains all relevant data views. It supports the operator when setting up production orders, at the same time displaying production-related facts in real time.





3D simulation/CyberGrinding
In a 3D simulation of the indexable insert, the operator can immediately see the consequences a parameter change may have. This allows prevention of errors in advance and increases productivity.

- Flexible programming
- PCD grinding pressure module with crushing function
- 3D simulation

“Three in One” sharpening unit
Simple wizard-based programming enables easy handling of the “Three in One” sharpening unit. Grinding wheel dressing can be optimally supported with the ProGrind software.

FANUC control unit, the global standard

- Multi-processor system – high system security
- FANUC bus for digital drives – fault-free communication
- CNC and robots from a single manufacturer – no interface problems

With the FANUC control unit, EWAG relies on the global standard of control technology. For the user, this means the highest degree of reliability, availability and operating comfort.

Customer Care

WALTER and EWAG deliver systems and solutions worldwide for all areas of tool machining. Our claim is based on ensuring maximum availability of our machines over their entire service life. For this we have thus bundled numerous services in our customer care program.

From "Start up" through "Prevention" to "Retrofit", our customers enjoy tailor made services for their particular machine configuration. Around the world, our customers can use helplines, which can generally solve a problem using remote service. In addition to that, you will also find a competent service team in your vicinity around the world. For our customers, this means:

- Our team is close by and can quickly be with you.
- Our team will support you to improve your productivity.
- Our team works quickly, focuses on the problem and its work is transparent.
- Our team solves every problem in the field of machining tools, in an innovative and sustainable manner.

Start up
Commissioning
Extension of the guarantee

Qualification
Training
Support for production

Prevention
Maintenance
Inspection

Service
Customer service
Customer advice
Helpline
Remote service

Digital Solutions
Remote Service
Service Monitor
Production Monitor

Material
Spare parts
Replacement parts
Accessories

Rebuild
Machine overhauling
Refurbishing of assemblies

Retrofit
Conversions
Retrofitting parts
Taking machines back

Technical data, dimensions

Axes

X axis	450 mm
Y axis	180 mm
Z axis	150 mm
Rapid traverse X	15 m/min
Rapid traverse Y, Z	10 m/min
A axis	- 15 to + 25°
B axis	∞
C axis	∞

Accuracy

Linear resolution	0.0001 mm
Rotary resolution	0.0001°

Drives

Peak power	5.5 kW
Grinding spindle speed	0 – 7,000 rpm
Max. grinding wheel diameter	250 mm

Others

Power consumption at 400 V/50 Hz	approx. 12 kVA
Weight incl. robot cell	approx. 4,000 kg

Tool data[1)]

Automatic clamping system for indexable inserts	
Min. indexable insert inscribed circle	3 mm
Max. indexable insert circumscribed circle	50 mm
Pin automatic clamping system	
Pin diameter min./max.	1.6 mm/10 mm

Options

- Manual clamping system (for lathe tool holder)
- Auto clamping system (turning, milling, grooving inserts)
- Pin clamping system (hole clamping)
- Pek clamping system (clamping via clamping ram)
- Clamping brace type clamping system (C axis)
- Automation with 6-axis FANUC robot
- Vision system for automatic insert detection
- Pallet changer (pallet loading system)
- Automatic regeneration unit
- Crushing function
- Pressure grinding
- Automatic fire-extinguishing system
- Coolant systems
- Coolant mist extraction systems

[1)] The maximum tool dimensions depend on the type of tool and its geometry, as well as the type of machining.

Creating Tool Performance

WALTER and EWAG are globally acting market-oriented technology and service companies, and are system and solution partners for all areas of tool machining. Our range of services is the basis for innovative machining solutions for practically all tool types and materials typical for the market with a high degree of added value in terms of quality, precision, durability and productivity.

Grinding – Grinding of rotationally symmetrical tools and workpieces

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC ESSENTIAL	P R	HSS HM C/K CBN	255 mm / Ø 1 – 100 mm
HELITRONIC MINI POWER	P R	HSS HM C/K CBN	255 mm / Ø 1 – 100 mm
HELITRONIC MINI AUTOMATION	P R	HSS HM C/K CBN	255 mm / Ø 1 – 100 mm
HELITRONIC RAPTOR	P R	HSS HM C/K CBN	280 mm / Ø 3 – 320 mm
HELITRONIC POWER 400	P R	HSS HM C/K CBN	520 mm / Ø 3 – 315 mm
HELITRONIC VISION 400 L	P R	HSS HM C/K CBN	420 mm / Ø 3 – 315 mm
HELITRONIC VISION 700 L	P R	HSS HM C/K CBN	700 mm / Ø 3 – 200 mm
HELITRONIC MICRO	P	HSS HM C/K CBN	120 mm / Ø 0.1 – 12.7 mm
	R	HSS HM C/K CBN	120 mm / Ø 3 – 12.7 mm

Eroding – Electrical discharge machining and grinding of rotationally symmetrical tools

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC DIAMOND EVOLUTION	P R	HSS HM C/K CBN PKD	185/255 mm / Ø 1 – 165 mm
HELITRONIC RAPTOR DIAMOND	P R	HSS HM C/K CBN PKD	270 mm / Ø 3 – 400 mm
HELITRONIC POWER DIAMOND 400	P R	HSS HM C/K CBN PKD	520 mm / Ø 3 – 380 mm
HELITRONIC VISION DIAMOND 400 L	P R	HSS HM C/K CBN PKD	420 mm / Ø 3 – 315 mm

Software – The intelligence of tool machining and measuring for production and regrinding

Customer Care – Comprehensive range of services

Grinding – Grinding of indexable inserts

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
COMPACT LINE	P R	HSS HM C/K CBN PKD	Ø 3 mm / Ø 50 mm

Laser – Laser machining of indexable inserts and/or rotationally symmetrical tools

EWAG machines	Use	Materials	Tool dimensions [1] max. length / diameter
LASER LINE ULTRA	P R	HM C/K CBN PKD CVD-D MKD/ND	250 mm / Ø 0.1 – 200 mm
LASER LINE PRECISION	P R	CBN PKD CVD-D MKD/ND	250 mm / Ø 0.1 – 200 mm

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
LASER LINE ULTRA	P R	HM C/K CBN PKD CVD-D MKD/ND	Ø 3 mm / Ø 50 mm
LASER LINE PRECISION	P R	CBN PKD CVD-D MKD/ND	Ø 3 mm / Ø 50 mm

Measuring – Contactless measurement of tools, workpieces and grinding wheels

WALTER machines	Use	E1-Value	Tool dimensions [1] max. length / diameter
HELICHECK ADVANCED	M	(1.8 + L/300) µm	420 mm / Ø 1 – 320 mm
HELICHECK PRO	M	(1.2 resp. 1.4 + L/300) µm	300 mm / Ø 1 – 200 mm
HELICHECK PRO LONG	M	(1.2 resp. 1.4 + L/300) µm	730 mm / Ø 1 – 200 mm
HELICHECK PLUS	M	(1.2 resp. 1.4 + L/300) µm	300 mm / Ø 0.1 – 200 mm
HELICHECK PLUS LONG	M	(1.2 resp. 1.4 + L/300) µm	730 mm / Ø 0.1 – 200 mm
HELICHECK 3D	M	(1.8 + L/300) µm	420 mm / Ø 3 – 80 mm
HELISET PLUS	M	–	400 mm / Ø 1 – 350 mm
HELISET	M	–	400 mm / Ø 1 – 350 mm

Use: P Production R Regrinding M Measuring
Materials: HSS High speed steel TC Tungsten carbide C/C Cermet/ceramics CBN Cubic boron nitride PCD Polycrystalline diamond CVD-D Chemical vapour deposition MCD/ND Monocrystalline diamond/natural diamond

[1] Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.
[2] From the theoretical taper diameter of the workpiece holder.

EWAG

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EWAMATIC LINEAR

The flexible solution for all tool types

Key parameters

The EWAMATIC LINEAR is a universal tool grinding machine for indexable inserts and rotationally symmetrical tools made of carbide, cermet, ceramic or super-hard materials such as CBN and PCD. It machines indexable inserts from 3 mm inscribed circle to 50 mm circumscribed circle diameter, rotationally symmetrical tools and production parts with diameters from 0.2 mm to 200 mm.

EWAG

Ewag AG

The origins of Ewag AG date back to 1946 when the company manufactured precision tool grinding machines for the Swiss watch industry. Today the EWAG product range includes manual machines for grinding and regrinding tools as well as the production of small precision parts, CNC tool grinding machines for grinding as well as laser machines for indexable cutting inserts and rotationally symmetrical tools made from carbide.

Ewag AG is part of the UNITED GRINDING Group. Together with our sister company, Walter Maschinenbau GmbH, we consider ourselves to be a supplier of systems and solutions for the complete machining of tools and can offer a wide range of products, including grinding, rotary eroding, laser machining, measurement and software.

Our customer focus and our global sales and service network of company-owned locations and employees has been appreciated by our customers for decades.

EWAMATIC LINEAR

The EWAMATIC LINEAR with automatic clamping systems for all tool types is one of the most flexible production machines on the market. The clamping systems securely hold indexable inserts and rotationally symmetrical tools for precise complete machining in a single clamping.


Grinding


Grinding


Software

The EWAMATIC LINEAR at a glance

Application

- Production of rotationally symmetrical tools and production parts from 0.2 to 200 mm diameter
- Production of indexable inserts from 3 mm inscribed circle to 50 mm circumscribed circle diameter
- Machinable materials include HSS, carbide, cermet, ceramic, CBN, PCD

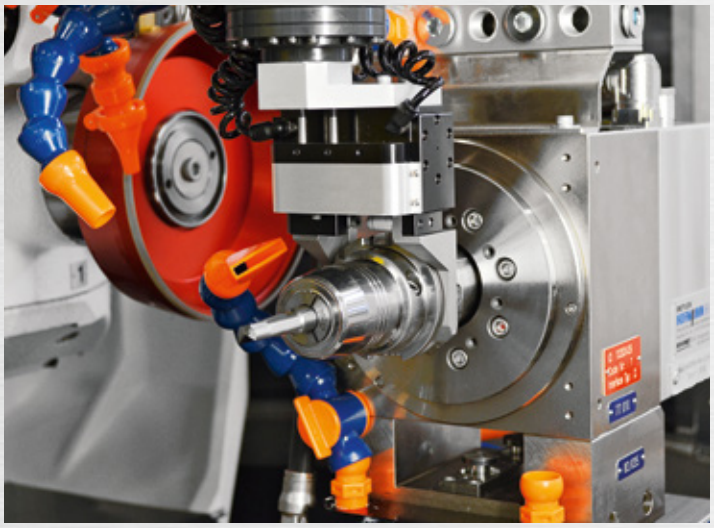
The machine

- 6-axis CNC grinding machine
- Vibration-absorbing cast machine base
- Direct drive linear axes in X, Y, Z with glass scales
- Rotary axes B, C with torque direct drives
- Star-shaped wheel changer with 6 grinding spindles
- Ultra-precise wheel changer with Hirth coupling
- Capacity: up to 12 grinding wheels
- Piezo grinding pressure control for super-hard materials
- Various automatic clamping systems (hydr./pneum.): dividing head, clamping brace
- NUM FLEXIUM control
- 6-axis FANUC robot for automatic loading

EWAMATIC LINEAR for grinding indexable inserts and rotationally symmetrical tools made of all materials, with automatic loading by FANUC robot.

Software

- ProGrind Software
- NUMROTOplus Software
- Wizard programming
- Human Machine Interface (HMI) for real-time information
- PCD grinding pressure module
- 3D simulation tool
- Increased efficiency due to numerous options



EWAMATIC LINEAR
Flexibility, precision, productivity
The CNC-controlled EWAMATIC LINEAR focuses on the tailored demands and challenges of the user. It performs a multitude of grinding operations in a single clamping. Its flexibility with regard to tool type, tool geometry and cutting material in the preset dimensional range can hardly be surpassed. Depending on the tool, the star-shaped grinding spindle holder is equipped with up to 12 grinding wheels.

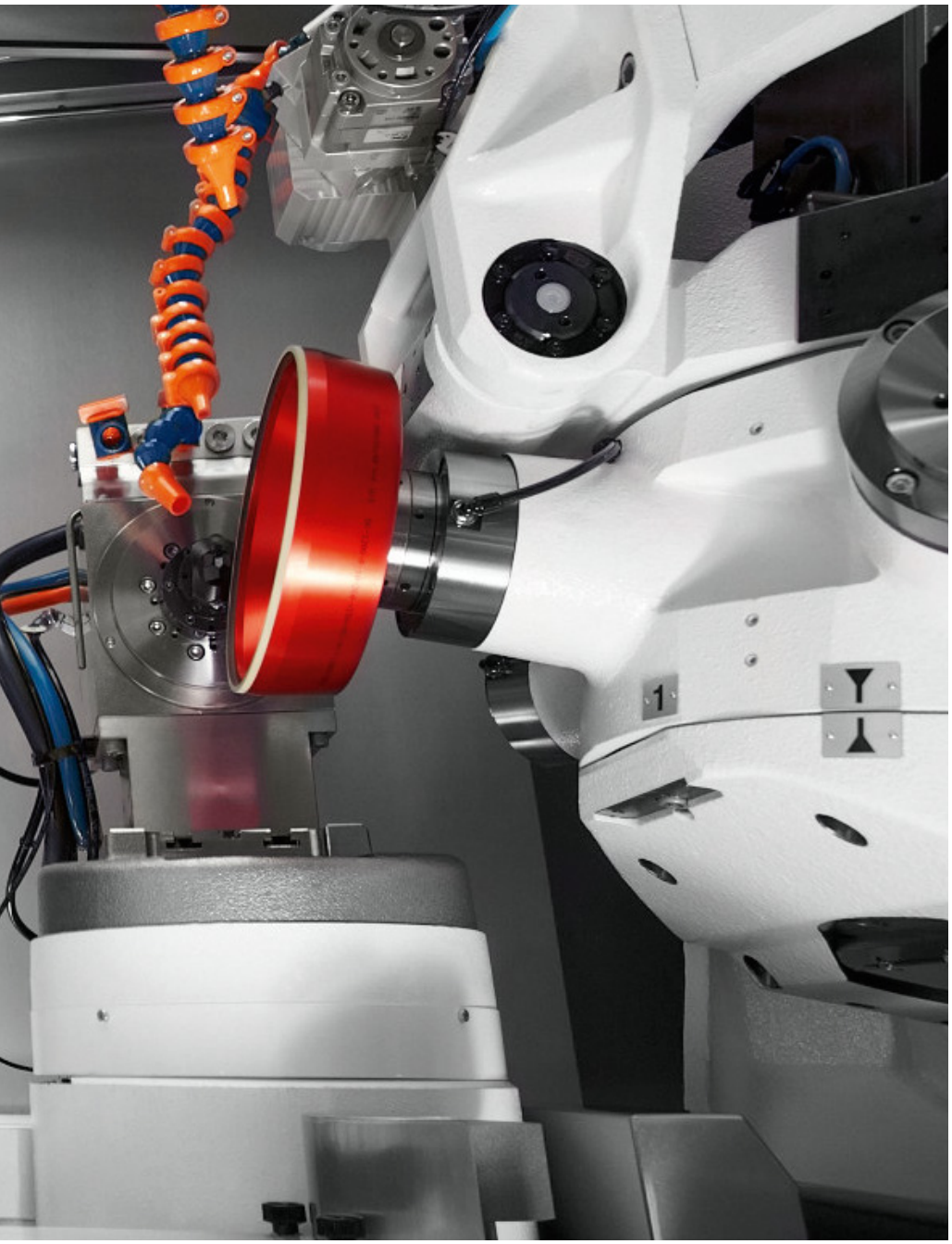
Three criteria have a decisive influence on the ability to achieve high volume performance:

- Automatic flexible loading with 6-axis robot
- Integrated dressing/regeneration of grinding wheels
- Tool measurement in the machine using 3D measuring probe

The EWAMATIC LINEAR uses ProGrind to control the entire workflow from loading to inspection.

Flexible clamping systems for all applications
Flexible grinding requires custom-optimised clamping systems which can be automatically detected and installed by the machine via plug & play. The TA 77 dividing head, for example, is used for rotationally symmetrical tools. The workhead with side clamping or the automatic clamping station are preferably used for indexable inserts. EWAG also offers a wide range of custom solutions for the EWAMATIC LINEAR.

One machine – countless applications

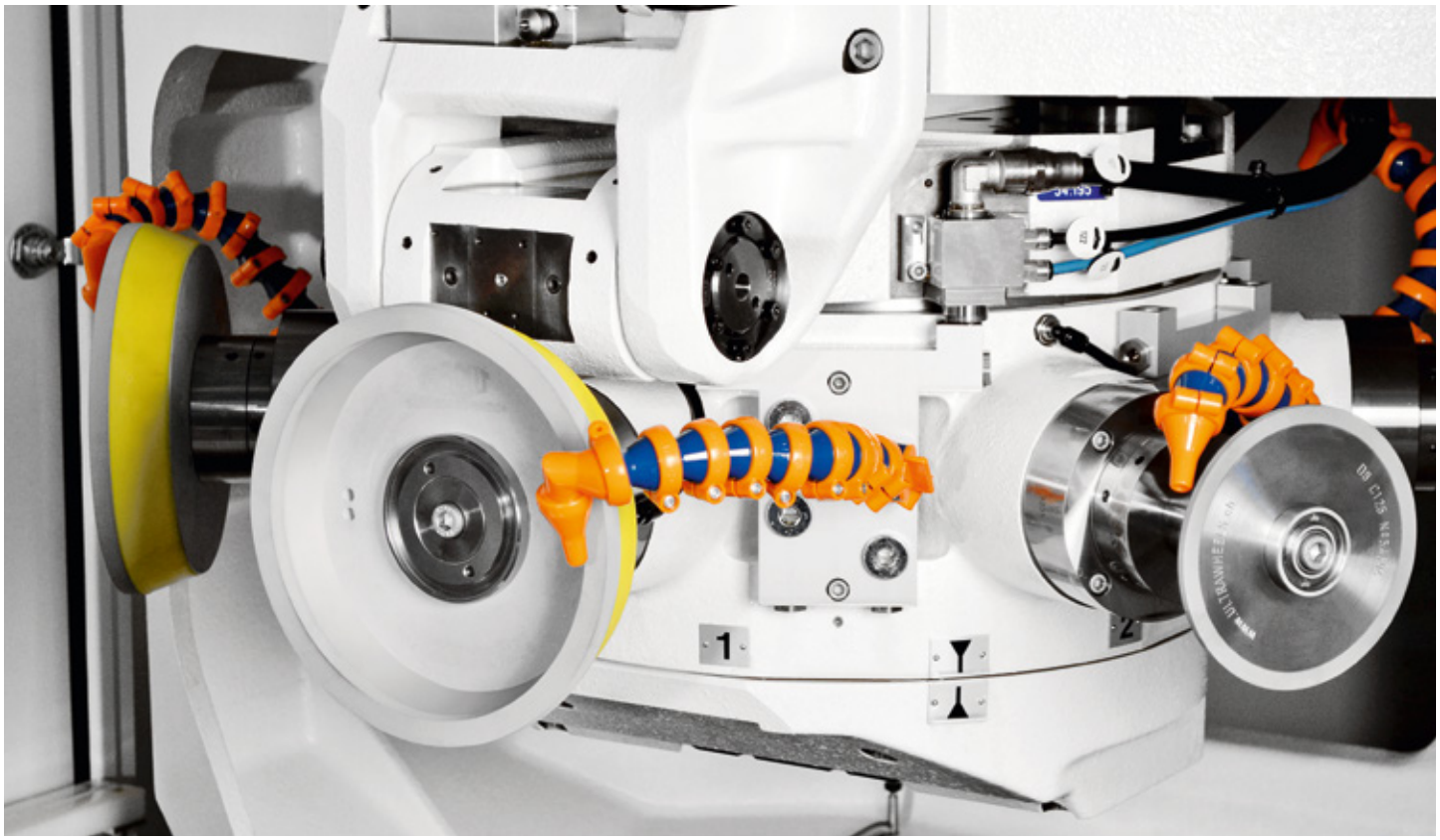


Universal tool suppliers of indexable inserts and rotationally symmetrical tools, irrespective of their geometries and materials, will find their customised production solution in the EWAMATIC LINEAR. Machine, software and peripherals are tailored to custom requirements. The customer's needs come first.

FANUC robot
The 6-axis robot from FANUC is perfectly matched to the flexibility of the EWAMATIC LINEAR. It automatically loads the grinding centre with the workpiece, thus creating the prerequisite for automatic shift operation.

Tool examples:
Grinding on the EWAMATIC LINEAR

Modules for dynamic grinding performance

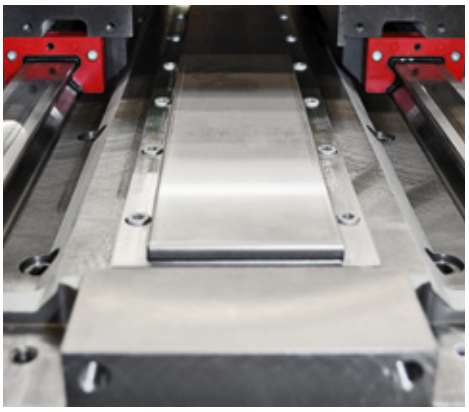


- Ultra-precise wheel changer
- Linear direct drives in X/Y/Z axis
- Torque drives in B/C axis

Star-shaped grinding spindle holder
With up to six grinding spindle holders. Two grinding wheels possible per holder. Changing the grinding wheels takes only a few seconds, with no impairment to the precision of work.

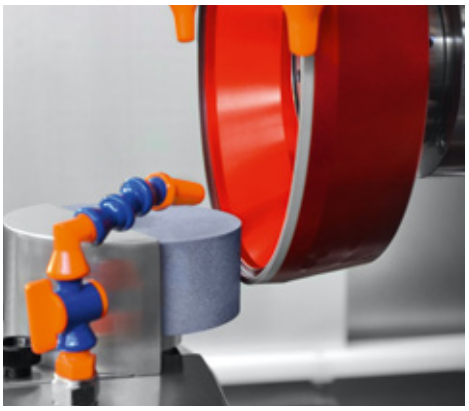
Torque drive
The B and C rotary axes are fitted with torque direct drives. Highest dynamic and true running accuracy are the result of it.

- 3D measuring station
- Linear axes with glass scales
- Automatic tool handling

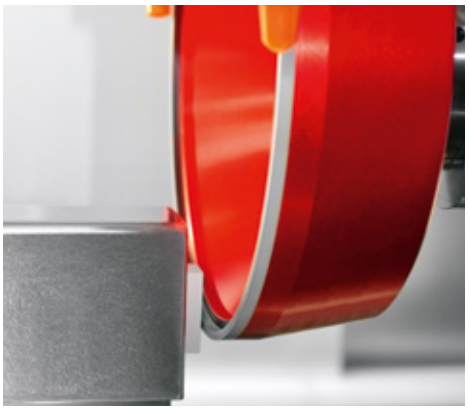


Linear direct drives
The EWAMATIC LINEAR is equipped with direct drives in X/Y/Z axis. Highest dynamics and best grinding precision are guaranteed.

3D tool measuring
Tools are measured in the production process using an integrated 3D measuring probe from Renishaw. Impermissible tolerances are automatically compensated. Preliminary measurements and tool orientation are automatically detected.



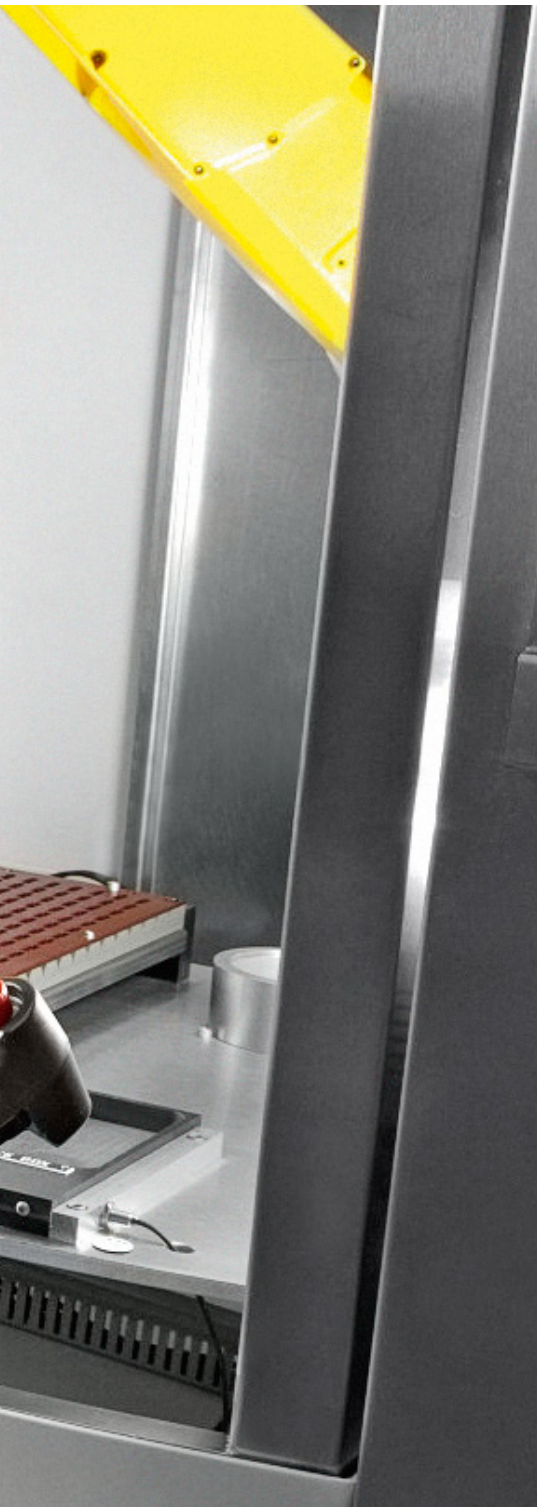
Automatic dressing system
The fully integrated dressing system enables the dressing of grinding wheels at the front and periphery of the wheel in the machine. This ensures perfect runout and the high grinding quality of the EWAMATIC LINEAR.



Automatic regenerating system
An automatic system comprising hardware and software to regenerate grinding wheels. Grinding pressure control prevents overloads on the grinding wheel, increasing the durability and safeguarding final accuracy.

Flexible and efficient automation

FANUC robot
The 6-axis robot is design for fully automatic loading. It can be freely programmed, thus enabling maximum loading flexibility.



1

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Multiple shift operation is assured at all times with up to 100 HSK 63 positions or by using indexable insert pallets.

Cleaning stations, presence checks, as well as a vision system and integrated laser marking are just some of the customised automation solutions it offers. Flexibility is our speciality.

1 TA 77 loading

2 Cleaning station for HSK 63 interface

EWAG ProGrind grinding software with NUMROTO*plus* plug-in

ProGrind – more than just software!
Innovation demands innovative software. As customer-centric software from EWAG, ProGrind meets all your exacting demands. Programs can be created quickly and easily on all EWAG CNC machines with ProGrind. The input screens feature 3D graphics. The machines can be integrated within your company network via Ethernet. At the same time, our specialists have access for diagnostic and maintenance purposes.

EWAG standard application framework

- Human Machine Interface (HMI)
- Wheels administration
- Production
- CNC programming
- Hardware
- Job management

EWAMATIC LINEAR
ProGrind grinding software with NUMROTO*plus* plug-in

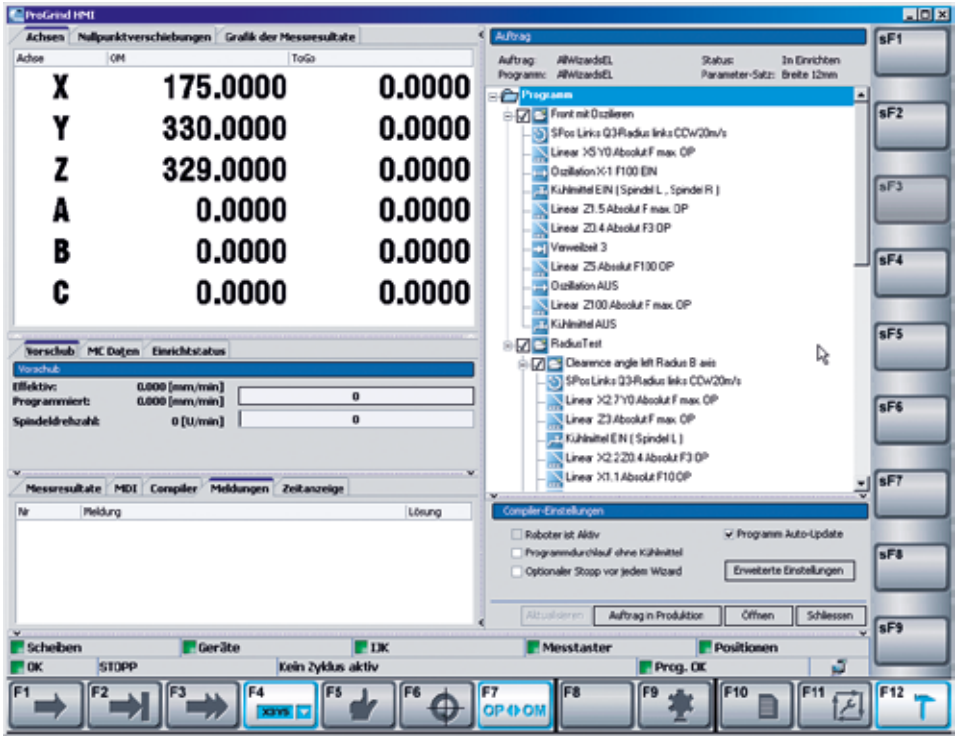
PROFILE LINE
ProGrind grinding software with HELITRONIC TOOL STUDIO plug-in

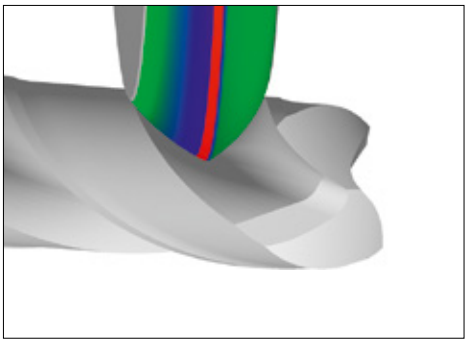
COMPACT LINE
ProGrind grinding software with CyberGrinding plug-in

INSERT LINE
ProGrind HSM grinding software with EwagInsert ISM plug-in

LASER LINE ULTRA
LASER LINE PRECISION
LaserSoft laser software with LaserPro 3D plug-in

Human machine interface (HMI)
The HMI contains all relevant data views. It supports the operator when setting up production orders, at the same time displaying production-related facts in real time.

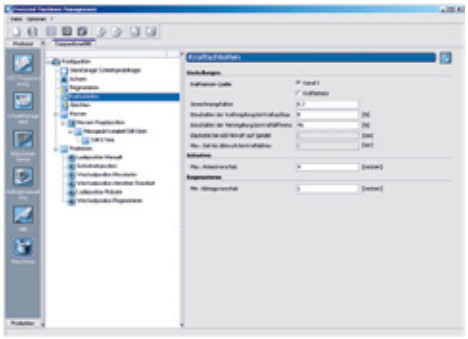




NUMROTO*plus*
The NUMROTO software is a comprehensive package for producing and regrinding diverse tools. In optional combination with ProGrind, the production of complex tools leaves practically nothing to be desired.

Crushing function
Controls the forces between the crushing roll and the profile grinding wheel and improves their durability.

- Easy programming
- Only relevant parameters visible
- Customers can design surface itself



PCD grinding pressure module
When grinding PCD tools, control of the grinding force is absolutely essential. The module controls the force via the grinding pressure and matches the machine feed rate to it. In this way, blades made of super-hard materials can be economically produced. The force control is activated in the programming wizard.

Hightech technology in tool grinding

- CNC expertise
- Safety architecture
- Great flexibility

The NUM CNC system hardware is controlled via the NUM FLEXIUM operating terminal with integrated PC. The tool grinding machine can also be directly operated near the grinding head using a small and light hand-held terminal.

Customer Care

WALTER and EWAG deliver systems and solutions worldwide for all areas of tool machining. Our claim is based on ensuring maximum availability of our machines over their entire service life. For this we have thus bundled numerous services in our customer care program.

From “Start up” through “Prevention” to “Retrofit”, our customers enjoy tailor made services for their particular machine configuration. Around the world, our customers can use helplines, which can generally solve a problem using remote service. In addition to that, you will also find a competent service team in your vicinity around the world. For our customers, this means:

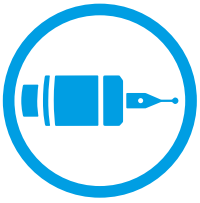
- Our team is close by and can quickly be with you.
- Our team will support you to improve your productivity.
- Our team works quickly, focuses on the problem and its work is transparent.
- Our team solves every problem in the field of machining tools, in an innovative and sustainable manner.

Start up
Commissioning
Extension of the guarantee

Qualification
Training
Support for production

Prevention
Maintenance
Inspection

Service
Customer service
Customer advice
Helpline
Remote service



Material
Spare parts
Replacement parts
Accessories

Rebuild
Machine overhauling
Refurbishing of assemblies

Retrofit
Conversions
Retrofitting parts
Taking machines back

Technical data, dimensions

Axes

X axis	380 mm
Y axis	240 mm
Z axis	245 mm
Rapid traverse X, Y, Z	20 m/min
A axis, inclined axis	- 15 to + 25°
B axis, rotary axis	± 135°
C axis, rotary axis	∞

Drives

Max. grinding wheel diameter	300 mm
Peak power	7.5 kW
Grinding spindle speed	200 – 9,000 rpm

Accuracy

Linear resolution	0.0001 mm
Axial resolution	0.001°

Others

Power consumption at 400 V/50 Hz	approx. 16 kVA
Weight incl. robot cell	approx. 5,000 kg

Tool data[1)]

Automatic clamping system for indexable inserts

Min. indexable insert inscribed circle	3 mm
Max. indexable insert circumscribed circle	50 mm

Pin automatic clamping system

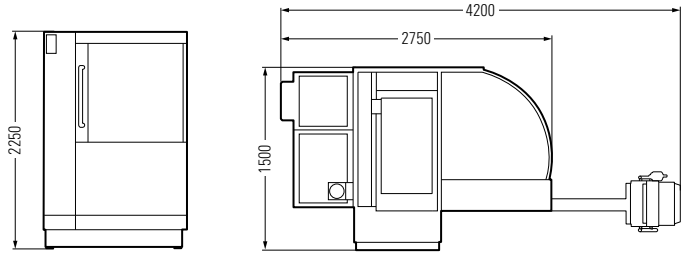
Pin, diameter	1.6 – 10 mm

Automatic clamping system for rotationally symmetrical tools

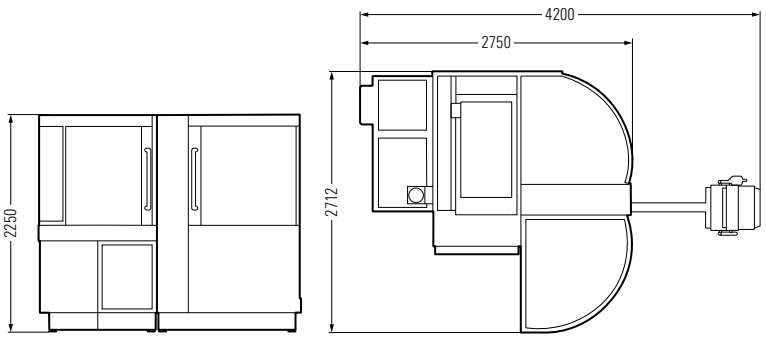
Chuck, diameter	0.5 – 32 mm
HSK 63, diameter	0.2 – 200 mm

Options

- TA 77 (C axis)
- Inclined axis (A axis)
- Grinding spindles (max. 6 pieces)
- High speed spindle up to 50,000 rpm
- Manual clamping system (for lathe tool holder)
- Auto clamping system (turning, milling, grooving inserts)
- Pin clamping system (Mandrel in C-axis)
- Pek clamping system (clamping via stamp)
- Automation with FANUC robot
- Vision system for automatic insert detection
- Automatic regeneration unit
- Crushing function
- Coolant systems
- Coolant mist extraction systems



EWAMATIC LINEAR



EWAMATIC LINEAR with robot

[1)] The maximum tool dimensions depend on the type of tool and its geometry, as well as the type of machining.

Measurements in mm. Subject to modifications due to technical progress and errors. No guarantee is provided for this information.

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Grinding – Grinding of rotationally symmetrical tools and workpieces

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC ESSENTIAL	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI POWER	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI AUTOMATION	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC BASIC	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER 400	P R	HSS TC C/C CBN	520 mm / Ø3 – 315 mm
HELITRONIC VISION 400	P R	HSS TC C/C CBN	370 mm / Ø3 – 315 mm
HELITRONIC VISION 400 L	P R	HSS TC C/C CBN	420 mm / Ø3 – 315 mm
HELITRONIC VISION 700 L	P R	HSS TC C/C CBN	700 mm / Ø3 – 200 mm
HELITRONIC MICRO	P	HSS TC C/C CBN	120 mm / Ø0.1 – 12.7 mm
	R	HSS TC C/C CBN	120 mm / Ø3 – 12.7 mm

EWAG machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	200 mm / Ø0.2 – 200 mm
PROFILE LINE	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
WS 11/WS 11-SP	P R M	HSS TC	– / up to Ø25 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Eroding – Electrical discharge machining and grinding of rotationally symmetrical tools

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC DIAMOND EVOLUTION	P R	HSS TC C/C CBN PCD	185/255 mm / Ø1 – 165 mm
HELITRONIC POWER DIAMOND	P R	HSS TC C/C CBN PCD	350 mm / Ø3 – 290 (400) mm
HELITRONIC POWER DIAMOND 400	P R	HSS TC C/C CBN PCD	520 mm / Ø3 – 380 mm
HELITRONIC VISION DIAMOND 400	P R	HSS TC C/C CBN PCD	370 mm / Ø3 – 315 mm
HELITRONIC VISION DIAMOND 400 L	P R	HSS TC C/C CBN PCD	420 mm / Ø3 – 315 mm

Software – The intelligence of tool machining and measuring for production and regrinding

Customer Care – Comprehensive range of services

Grinding – Grinding of indexable inserts

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
PROFILE LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø50 mm
COMPACT LINE	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
INSERT LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø75 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Laser – Laser machining of indexable inserts and/or rotationally symmetrical tools

EWAG machines	Use	Materials	Tool dimensions [1] max. length / diameter
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm

Measuring – Contactless measurement of tools, workpieces and grinding wheels

WALTER machines	Use	Tool dimensions [1] max. length / diameter
HELICHECK PRECISION	M	420 mm / Ø1 – 320 mm
HELICHECK ADVANCED	M	420 mm / Ø1 – 320 mm
HELICHECK PRO	M	300 mm / Ø1 – 200 mm
HELICHECK PRO LONG	M	730 mm / Ø1 – 200 mm
HELICHECK PLUS	M	300 mm / Ø0.1 – 200 mm
HELICHECK PLUS LONG	M	730 mm / Ø0.1 – 200 mm
HELICHECK 3D	M	420 mm / Ø3 – 80 mm
HELISET PLUS	M	400 mm / Ø1 – 350 mm
HELISET	M	400 mm / Ø1 – 350 mm

Use: P Production R Regrinding M Measuring

Materials: HSS High speed steel TC Tungsten carbide C/C Cermet/ceramics CBN Cubic boron nitride PCD Polycrystalline diamond CVD-D Chemical vapour deposition MCD/ND Monocrystalline diamond/natural diamond

[1] Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.
[2] From the theoretical taper diameter of the workpiece holder.

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BLUECOMPETENCE
Alliance Member
Partner of the Engineering Industry
Sustainability Initiative

INSERT LINE

High-speed peripheral grinding machine
for volume indexable insert production

Key parameters

The INSERT LINE is a 4-axis high-speed peripheral grinding machine for volume production of indexable inserts at the highest speeds. It grinds indexable inserts made of hard materials from 3 mm inscribed circle to max. 75 mm circumscribed circle diameter.

EWAG

Ewag AG

The origins of Ewag AG date back to 1946 when the company manufactured precision tool grinding machines for the Swiss watch industry. Today the EWAG product range includes manual machines for grinding and regrinding tools as well as the production of small precision parts, CNC tool grinding machines for grinding as well as laser machines for indexable cutting inserts and rotationally symmetrical tools made from carbide.

Ewag AG is part of the UNITED GRINDING Group. Together with our sister company, Walter Maschinenbau GmbH, we consider ourselves to be a supplier of systems and solutions for the complete machining of tools and can offer a wide range of products, including grinding, rotary eroding, laser machining, measurement and software.

Our customer focus and our global sales and service network of company-owned locations and employees has been appreciated by our customers for decades.

INSERT LINE

The first peripheral grinding machine for indexable inserts using the HSM – High Speed Machining – method with direct drive clamping system. The 4-axis high-speed peripheral grinding machine can thus achieve extremely high grinding speeds. Large grinding wheel diameters increase chip removal rates and achieve maximum surface qualities on indexable inserts. Overall, the grinding time is reduced by up to 50 per cent.


Grinding


Software

The INSERT LINE at a glance

Application

- Volume production of indexable inserts
- Inscribed circle diameter from 3 mm
- Circumscribed circle diameter up to 75 mm
- Complex indexable insert geometries
- Machinable materials include HSS, carbide, cermet, ceramic, CBN

The machine

- Vibration-absorbing Granitan machine base
- 4-axis peripheral grinding machine
- HSM – High Speed Machining
- Grinding wheel diameter 350 to 500 mm
- Hydrostatic guides in X and Y axes
- Direct drives in all axes
- In process measuring system
- Dressing-Plus
- Twin-Stacker for up to 40 pallets
- FANUC control, the global standard
- Numerous options for production automation

INSERT LINE – High speed machining (HSM) with EWAG rotary drum solution and FANUC 6-axis robot for automatic multi-shift operation.

Software

- ProGrind HSM – High Speed Machining
- Easy programming of ISO standard shapes
- HSM analysis tool for maximum speeds
- 3D simulation to ensure the highest quality standards

High-speed peripheral grinding
Top performance with indexable inserts
INSERT LINE represents a new class of performance in the peripheral grinding of indexable inserts. With cutting-edge drive and control technology in addition to high speed machining (HSM), indexable insert grinding with the grinding wheel periphery is possible for the first time. In conjunction with the EWAG ProGrind HSM grinding software, line contact between the indexable insert and the grinding wheel is achieved. The minimal resulting contact face considerably reduces friction and thermal loads in the contact zone. At the same time, the cooling lubricant supply is improved. The overall result is greatly improved chip removal performance, better surface quality and greater cutting edge quality. Ideal prerequisites for top performance when grinding indexable inserts.

Variable grinding wheel diameters enable the grinding of concave shapes. The machine kinematics are designed for maximum reliability. Together with the proven EWAG ProGrind HSM grinding software, even inexperienced operators can immediately get to grips with the machine.

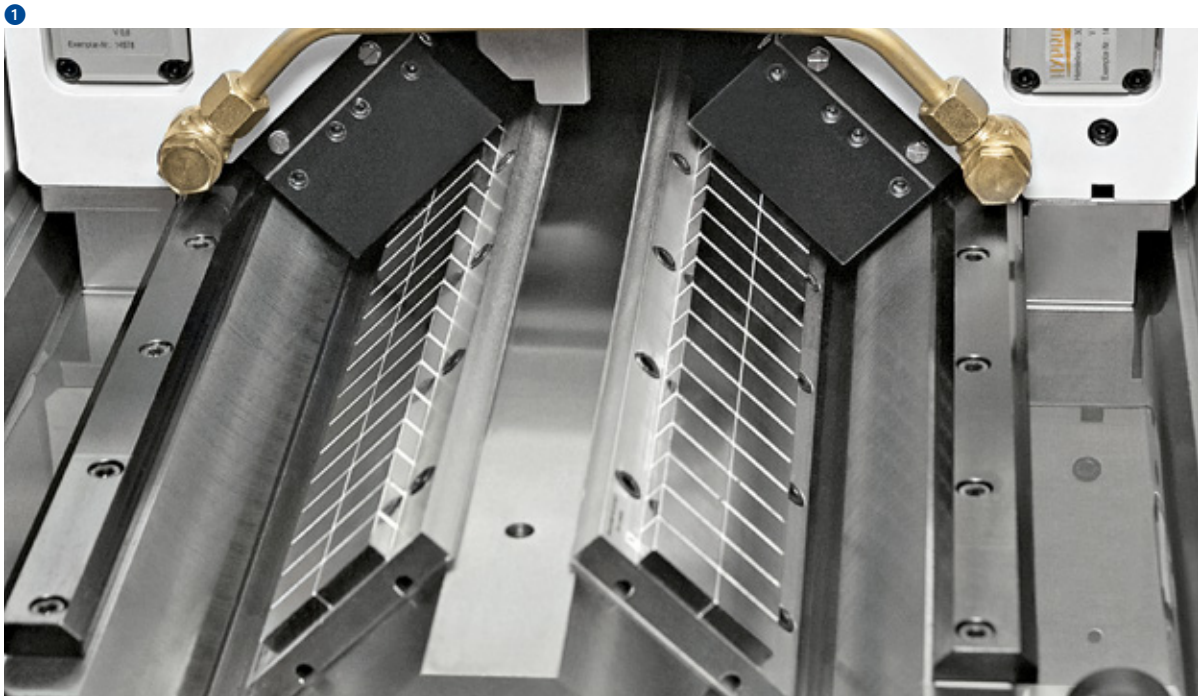
An optional 6-axis robot from FANUC with pallet loading system propels the INSERT LINE to top performance in automatic multi-shift operation.

INSERT LINE – precision and productivity

Tool examples:
Grinding on the INSERT LINE

High-end grinding technology

1



Advantages of peripheral grinding with the wheel periphery:

- Less friction
- Less heat generation
- Higher chip removal rate

Hydrostatics with direct drives
Magnetically pre-stressed hydrostatic guides, a machine base made of Granitan and modern direct drives on all axes guarantee the highest precision, process reliability and ensure unique dynamics.

Direct drive clamping system
Securely fixes the indexable insert in the correct position for high grinding speeds with the greatest precision.

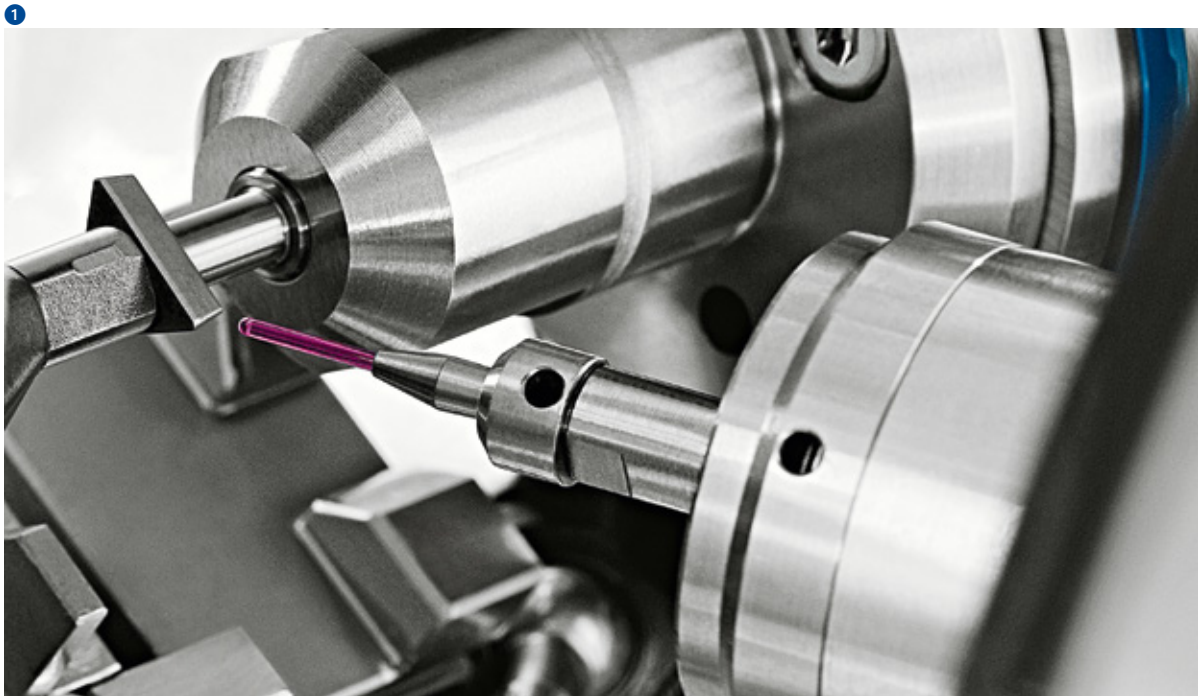
High Speed Machining HSM
The line contact between the grinding wheel and tool reduces the contact zone, improve cooling lubricant supply, lowers heat input and thus enables higher feed rates. The new HSM grinding technology in the INSERT LINE is optimally supported with grinding wheel diameters of up to 500 mm.

2

3

1 Hydrostatics with direct drives
2 Direct drive clamping system
3 High Speed Machining HSM

1



Technology for productivity:

- Measuring probe with strain gauge technology
- In process measuring system
- Dressing-Plus

3D tool measuring

Tools are measured in the production cycle using a highly accurate measuring probe with optional strain gauge technology. Impermissible tolerances are compensated within the machine. The result is high grinding precision.

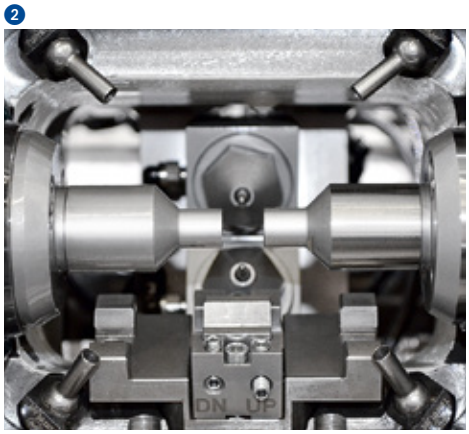
In process measuring system

The new in process measuring system with integrated pallet thickness measuring results in faster cycle times. Positioning, eccentricity, calliper or pallet thickness measurement control; the IP-M system delivers the highest level of accuracy.

Dressing-Plus

The direct drive dressing spindle integrated on the B axis of rotation with two dressing wheels enables flexible dressing with the highest level of precision. The additional system Dressing-Plus enables the dressing cycle during the loading procedure. The auxiliary process time is thereby further reduced and the machine efficiency increased.

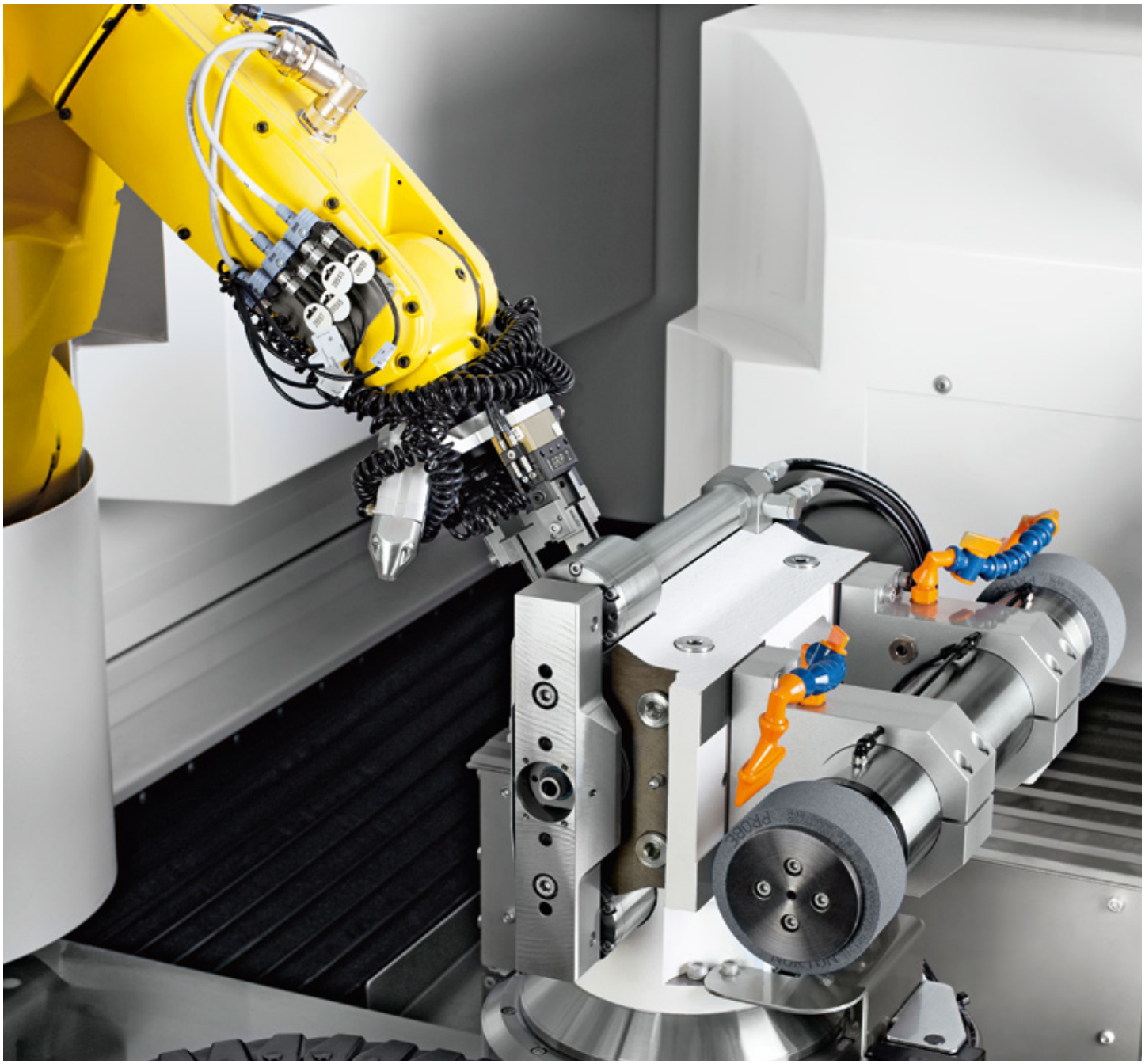
2



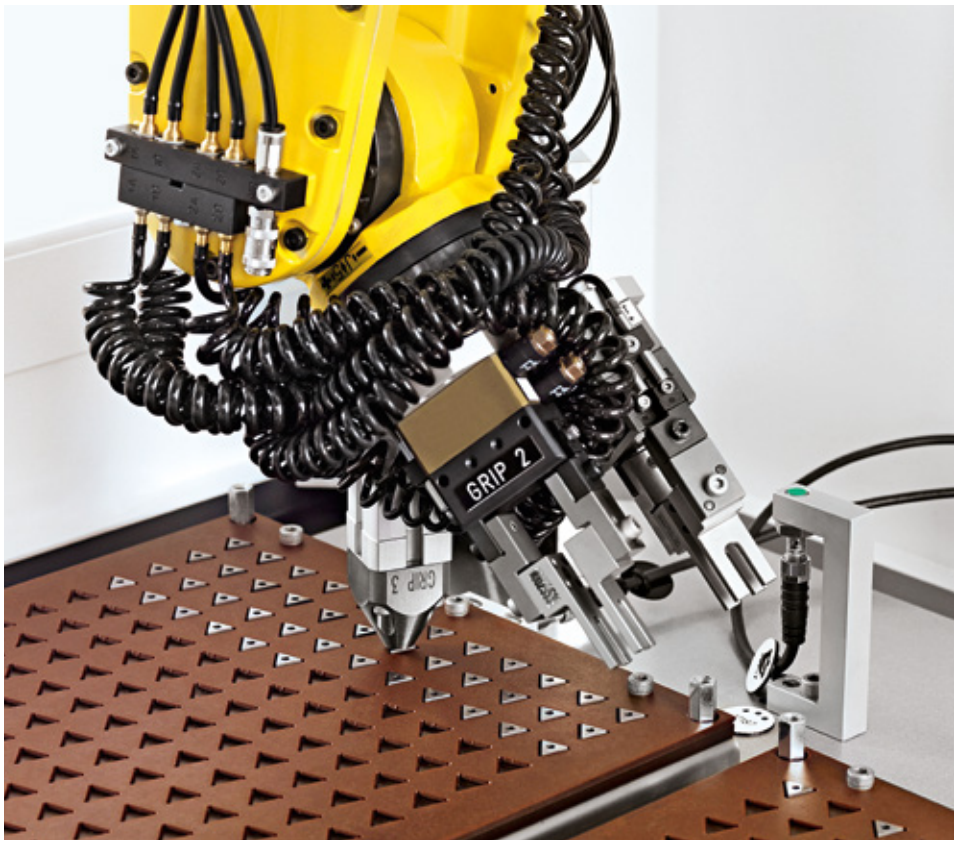
3

1 3D measurement
2 In process measuring system
3 Dressing-Plus

Experience and expertise in tool handling



FANUC robot
The efficient EWAG rotary drum solution for robot integration allows the shortest changeover times and supports the high productivity of the machine. In addition, the unique rotary drum solution automatically shields the grinding area, thereby preventing contamination in the handling area. Indexable inserts are passed by the robot gripper directly to the clamping station. This precise loading action is also supported by a prism guide integrated in the clamping station.



- Flexible customised tool solutions
- Maximum machine capacity with up to 40 pallets
- Efficient vision system (DVI camera)
- Cleaning, reclamping and laser marking stations can optionally be fully integrated

Triple gripper
The triple gripper on the FANUC robot reduces tool changeover times to a minimum. The indexable inserts are picked up from an insert grid using a magnetic gripper, are aligned at a centering station and passed on to the clamping station.

Twin-Stacker
For the ultimate automation, the 40x pallet changer is the ideal addition for efficient grinding of indexable inserts in multi-shift operation. The Twin-System achieves a great deal of flexibility in the loading of the machine.

Vision system
The highly efficient integrated vision system enables loading from grid- or foam pallets using a magnetic gripper. The smallest sintering marks on the indexable insert can also be detected, guaranteeing consistent loading to the loading prism.

EWAG ProGrind grinding software with EwagInsert HSM plug-in

ProGrind – more than just software!
Innovation demands innovative software. As customer-centric software from EWAG, ProGrind meets all your exacting demands. Programs can be created quickly and easily on all EWAG CNC machines with ProGrind. The input screens feature 3D graphics. The machines can be integrated within your company network via Ethernet. At the same time, our specialists have access for diagnostic and maintenance purposes.

EWAG standard application framework

- Human Machine Interface (HMI)
- Wheels administration
- Production
- CNC programming
- Hardware
- Job management

INSERT LINE
ProGrind HSM grinding software with EwagInsert ISM plug-in

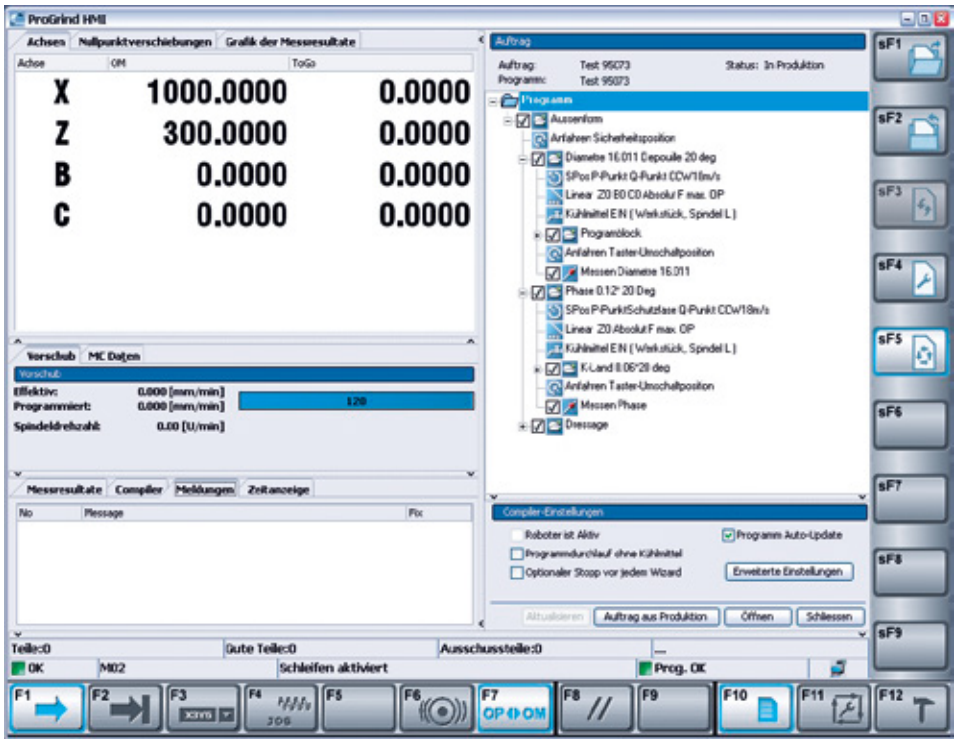
EWAMATIC LINEAR
ProGrind grinding software with NUMROTO*plus* plug-in

PROFILE LINE
ProGrind grinding software with HELITRONIC TOOL STUDIO plug-in

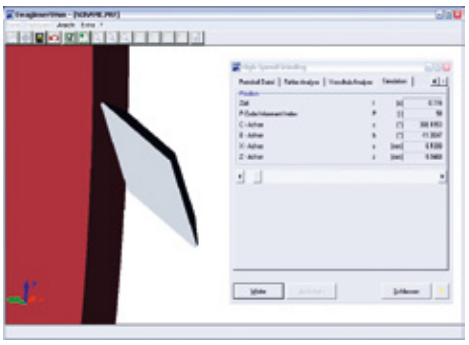
COMPACT LINE
ProGrind grinding software with CyberGrinding plug-in

LASER LINE ULTRA
LASER LINE PRECISION
LaserSoft laser software with LaserPro 3D plug-in

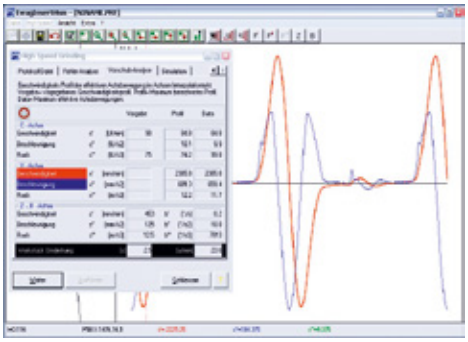
Human machine interface HMI
The HMI contains all relevant data views. It supports the operator when setting up production orders, at the same time displaying production-related facts in real time.



3D simulation
In a 3D simulation of the programmed tool, the operator can immediately see the consequences of a parameter change. This helps to prevent errors in advance and increase productivity.



- ISO geometric shapes via input screens
- 3D simulation
- Effective HSM analysis tool
- Standard EWAG human machine interface



Analysis tool (HSM)
With the integrated "High-Speed Machining" tool, the speed profile of the effective axis movements can be checked and, if need be, further optimised by the user.

ISO standard shapes
Programming of ISO geometric shapes with the associated variable and constant clearance angles can be easily selected via input screens. The setup effort is thus reduced to an absolute minimum.

FANUC control unit, the global standard

- Multi-processor system – high system security
- FANUC bus for digital drives – fault-free communication
- CNC and robots from a single manufacturer – no interface problems

With the FANUC control unit, EWAG relies on the global standard of control technology. For the user, this means the highest degree of reliability, availability and operating comfort.

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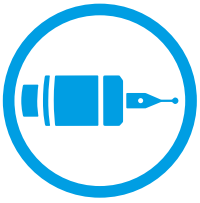
Customer advice
Helpline
Remote service



Material
Spare parts
Replacement parts
Accessories

Rebuild
Machine overhauling
Refurbishing of assemblies

Retrofit
Conversions
Retrofitting parts
Taking machines back

Technical data, dimensions

Axes

X axis, hydrostatic guide	300 mm
Z axis, hydrostatic guide	350 mm
Rapid traverse X, Z	30 m/min
B axis	+45 to -210°
C axis	∞

Accuracy

Linear resolution	0.00001 mm
Radial resolution	0.0001°

Drive

Drive power	7.5/12 kW
Spindle speed range	0–3,200 rpm
Max. grinding wheel diameter	500 mm

Others

Power consumption at 400 V/50 Hz	28 kVA
Weight incl. robot cell	approx. 8,000 kg
Weight of coolant system	approx. 750 kg

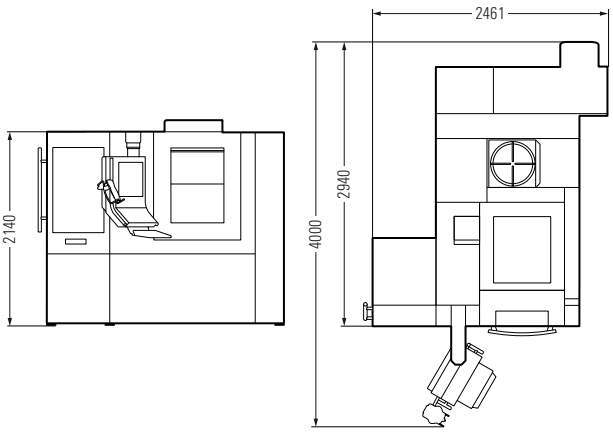
Tool data[1)]

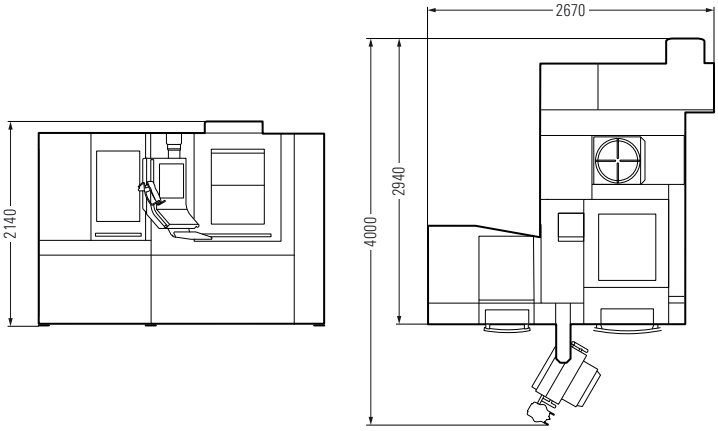
Direct drive clamping system

Clamping pressure	1,000–10,000 N
Min. indexable insert inscribed circle	3 mm
Max. indexable insert circumscribed circle	75 mm

Options

- Dressing-Plus
- In process measuring system
- Automatic wheel balancing
- Robot cell with 2 pallets
- Robot cell with pallet changer (Twin-Stacker)
- Vision system for automatic insert detection
- Software – see ProGrind description
- Automatic fire-extinguishing system
- Coolant systems up to 20 bar
- Coolant mist extraction systems





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HELITRONIC MINI AUTOMATION	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC BASIC	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER 400	P R	HSS TC C/C CBN	520 mm / Ø3 – 315 mm
HELITRONIC VISION 400	P R	HSS TC C/C CBN	370 mm / Ø3 – 315 mm
HELITRONIC VISION 400 L	P R	HSS TC C/C CBN	420 mm / Ø3 – 315 mm
HELITRONIC VISION 700 L	P R	HSS TC C/C CBN	700 mm / Ø3 – 200 mm
HELITRONIC MICRO	P	HSS TC C/C CBN	120 mm / Ø0.1 – 12.7 mm
	R	HSS TC C/C CBN	120 mm / Ø3 – 12.7 mm

EWAG machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	200 mm / Ø0.2 – 200 mm
PROFILE LINE	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
WS 11/WS 11-SP	P R M	HSS TC	– / up to Ø25 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Eroding – Electrical discharge machining and grinding of rotationally symmetrical tools

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC DIAMOND EVOLUTION	P R	HSS TC C/C CBN PCD	185/255 mm / Ø1 – 165 mm
HELITRONIC POWER DIAMOND	P R	HSS TC C/C CBN PCD	350 mm / Ø3 – 290 (400) mm
HELITRONIC POWER DIAMOND 400	P R	HSS TC C/C CBN PCD	520 mm / Ø3 – 380 mm
HELITRONIC VISION DIAMOND 400	P R	HSS TC C/C CBN PCD	370 mm / Ø3 – 315 mm
HELITRONIC VISION DIAMOND 400 L	P R	HSS TC C/C CBN PCD	420 mm / Ø3 – 315 mm

Software – The intelligence of tool machining and measuring for production and regrinding

Customer Care – Comprehensive range of services

Grinding – Grinding of indexable inserts

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
PROFILE LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø50 mm
COMPACT LINE	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
INSERT LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø75 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Laser – Laser machining of indexable inserts and/or rotationally symmetrical tools

EWAG machines	Use	Materials	Tool dimensions [1] max. length / diameter
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm

Measuring – Contactless measurement of tools, workpieces and grinding wheels

WALTER machines	Use	Tool dimensions [1] max. length / diameter
HELICHECK PRECISION	M	420 mm / Ø1 – 320 mm
HELICHECK ADVANCED	M	420 mm / Ø1 – 320 mm
HELICHECK PRO	M	300 mm / Ø1 – 200 mm
HELICHECK PRO LONG	M	730 mm / Ø1 – 200 mm
HELICHECK PLUS	M	300 mm / Ø0.1 – 200 mm
HELICHECK PLUS LONG	M	730 mm / Ø0.1 – 200 mm
HELICHECK 3D	M	420 mm / Ø3 – 80 mm
HELISET PLUS	M	400 mm / Ø1 – 350 mm
HELISET	M	400 mm / Ø1 – 350 mm

Use: P Production R Regrinding M Measuring

Materials: HSS High speed steel TC Tungsten carbide C/C Cermet/ceramics CBN Cubic boron nitride PCD Polycrystalline diamond CVD-D Chemical vapour deposition MCD/ND Monocrystalline diamond/natural diamond

[1] Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.
[2] From the theoretical taper diameter of the workpiece holder.

EWAG

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WS 11
WS 11-SP

The precision
of a Swiss watch

Key parameters

The WS 11/WS 11-SP are universal grinding machines offering the greatest precision for small to the smallest precision tools and production parts. For use in both production and regrinding operations. They machine tools up to 25 mm diameter. The greater the tool precision, the greater its use.

EWAG

Ewag AG

The origins of Ewag AG date back to 1946 when the company manufactured precision tool grinding machines for the Swiss watch industry. Today the EWAG product range includes manual machines for grinding and regrinding tools as well as the production of small precision parts, CNC tool grinding machines for grinding as well as laser machines for indexable cutting inserts and rotationally symmetrical tools made from carbide.

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Our customer focus and our global sales and service network of company-owned locations and employees has been appreciated by our customers for decades.

WS 11
WS 11-SP

These two universal grinding machines have proven their excellence in the Swiss watch industry. Each with four linear and three or four rotary axes, they grind complex, delicate geometries with maximum precision and just a single clamping. They are distinguished in this field and highly flexible in application.


Grinding


Grinding

The WS 11 / WS 11-SP at a glance

Application

- Production/regrinding of small rotationally symmetrical tools
- Production of small volume production precision parts
- Diameter up to 25 mm
- Materials HSS, carbide

The machine

- Compact, space-saving design
- Solid machine base Alu/cast iron
- Linear axes X, Y, (V), Z
- Rotary axes A, B, C, (D)
- SP model with additional grinding stroke axis V for spiral grinding
- Measuring optics for visible chip removal process and control measurements
- Ergonomical axis arrangement for fatigue-free operation
- Precise continuous performance for smallest tolerances thanks to hydrostatic grinding spindle with consistent heat expansion
- Large range of accessories for optimum adaptation to wide range of tasks

WS 11 universal grinding machine.

Geometries

- Sophisticated machine kinematics for ultra-precise reproduction of complex geometries
- Display of highly precise measurements
- Grinding and measuring in a single clamping – quality control
- Grinding of cylindrical, conical and spiral geometry in a single clamping

WS 11-SP universal grinding machine with additional grinding spindle inclined axis D and spindle height positioning axis V.

Groundbreaking in manual grinding techniques

1

1 Operator at microscope

Assured and convenient work at the WS 11: the operator always has the entire compact machine in sight. All axes are within reach and can be quickly and easily operated. Perfect ergonomics, a standard for precision.

In the SP model, the D and V axis are additionally integrated within the machine kinematics. It can be used to machine tools with spiral toothing.

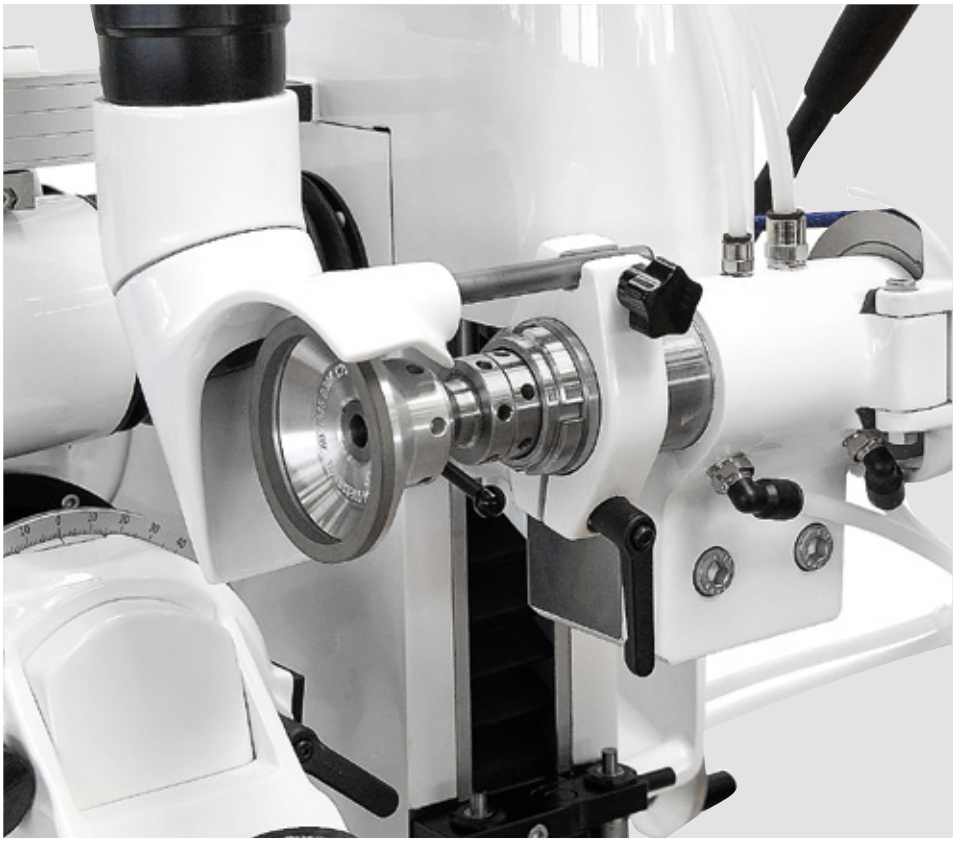
Tool examples:
Grinding on the WS 11 / WS 11-SP

Details of precise grinding performance

Pivoting grinding spindle
The pivoting and height-adjustable grinding spindle of the WS 11-SP makes the machining of spiral tools easy.

1

2



3

Hydrostatic spindle
The grinding spindle is hydrostatic to ensure maximum grinding precision. Quiet operation and minimal heat expansion are the advantages which impact positively on the grinding result.

Kinematics
The WS 11 and WS 11-SP universal grinding machines are marked by the special arrangement of their kinematics. As a result, the operator can accurately machine the most complex of tools.

1 Pivoting grinding spindle
2 Hydrostatic spindle
3 Kinematics

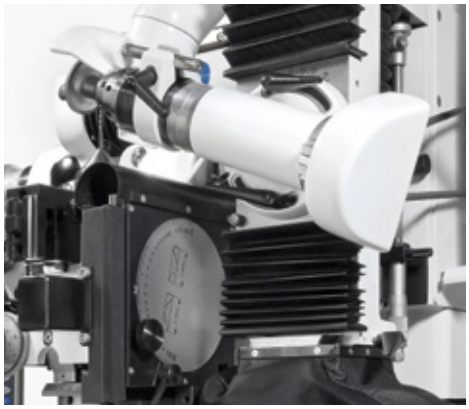
1

Hand wheels
The X, Y and Z linear axes can be positioned accurately within microns.

3

4

2



Digital display
With this optional feature, the key axis settings can be displayed clearly to an accuracy of 1 micrometre.

Sine bar
All spiral angles can be adjusted within a stepless range directly on the WS 11-SP with the sine bar.

Tool carrier C axis
The flexible W20 or W25 interface is used as a tool holder. This enables maximum runout and the tool can be machined either in rotary grinding or ultra-precise indexing mode.

1 Hand wheels
2 Sine bar
3 Digital display
4 Tool carrier C axis

Accessories for greater flexibility

1

Radius and spherical grinding attachment
This allows radii and forms with optimum tangent transition to be ground on tools in one clamping with high accuracy.

2

3

High-frequency spindle
It works at up to 100,000 rpm and can thus grind the smallest inside diameters and outer forms. This opens the door to the micro range.

Measuring optics
Displays the grinding process at a magnification of up to 100:1. At the same time, it checks and measures angles and diameters. A key control measure for grinding precision.

1 Radius and spherical grinding attachment
2 High-frequency spindle
3 Measuring optics

Customer Care

WALTER and EWAG deliver systems and solutions worldwide for all areas of tool machining. Our claim is based on ensuring maximum availability of our machines over their entire service life. For this we have thus bundled numerous services in our customer care program.

From “Start up” through “Prevention” to “Retrofit”, our customers enjoy tailor made services for their particular machine configuration. Around the world, our customers can use helplines, which can generally solve a problem using remote service. In addition to that, you will also find a competent service team in your vicinity around the world. For our customers, this means:

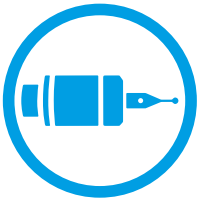
- Our team is close by and can quickly be with you.
- Our team will support you to improve your productivity.
- Our team works quickly, focuses on the problem and its work is transparent.
- Our team solves every problem in the field of machining tools, in an innovative and sustainable manner.

Start up
Commissioning
Extension of the guarantee

Qualification
Training
Support for production

Prevention
Maintenance
Inspection

Service
Customer service
Customer advice
Helpline
Remote service



Material
Spare parts
Replacement parts
Accessories

Rebuild
Machine overhauling
Refurbishing of assemblies

Retrofit
Conversions
Retrofitting parts
Taking machines back

Technical data, dimensions

Axes

X axis	100 mm
Y axis	100 mm
Z axis	100 mm
V axis (WS 11-SP)	184 mm
A axis	- 135 to + 30°
B axis	∞
D axis (WS 11-SP)	+/- 35°

Drives

Grinding spindle

Grinding spindle performance	0.3 kW
Grinding spindle speed	2,500 – 8,000 rpm
Max. grinding wheel diameter	75 mm

Tool spindle

Tool spindle performance	0.37 kW
Tool spindle speed	100 – 1,300 rpm
Tool spindle	W20 / W25

Accuracy

Linear resolution with digital display	0.001 mm
Radial resolution, rotational axes A,C	1°
Radial resolution, rotational axis B with angle micrometer	2°

Tool data[1)]

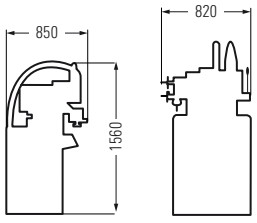
Max. diameter	25 mm

Options

- Dust extraction
- Digital display

Accessories

- Diverse wheel adapters
- Dressing attachment
- Digital micrometer with optics
- Measuring system diameter (0.0001 mm)
- Touch-Test TT
- Dividing head
- Eccentric grinding attachment
- Radius grinding attachment
- Spherical grinding attachment
- Spiral grinding attachment
- High-frequency spindle
- Further accessories on request



WS 11/WS 11-SP

[1)] The maximum tool dimensions depend on the type of tool and its geometry, as well as the type of machining.

Creating Tool Performance

WALTER and EWAG are globally acting market-oriented technology and service companies, and are system and solution partners for all areas of tool machining. Our range of services is the basis for innovative machining solutions for practically all tool types and materials typical for the market with a high degree of added value in terms of quality, precision, durability and productivity.

Grinding – Grinding of rotationally symmetrical tools and workpieces

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC ESSENTIAL	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI POWER	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI AUTOMATION	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC BASIC	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER 400	P R	HSS TC C/C CBN	520 mm / Ø3 – 315 mm
HELITRONIC VISION 400	P R	HSS TC C/C CBN	370 mm / Ø3 – 315 mm
HELITRONIC VISION 400 L	P R	HSS TC C/C CBN	420 mm / Ø3 – 315 mm
HELITRONIC VISION 700 L	P R	HSS TC C/C CBN	700 mm / Ø3 – 200 mm
HELITRONIC MICRO	P	HSS TC C/C CBN	120 mm / Ø0.1 – 12.7 mm
	R	HSS TC C/C CBN	120 mm / Ø3 – 12.7 mm

EWAG machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	200 mm / Ø0.2 – 200 mm
PROFILE LINE	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
WS 11/WS 11-SP	P R M	HSS TC	– / up to Ø25 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Eroding – Electrical discharge machining and grinding of rotationally symmetrical tools

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC DIAMOND EVOLUTION	P R	HSS TC C/C CBN PCD	185/255 mm / Ø1 – 165 mm
HELITRONIC POWER DIAMOND	P R	HSS TC C/C CBN PCD	350 mm / Ø3 – 290 (400) mm
HELITRONIC POWER DIAMOND 400	P R	HSS TC C/C CBN PCD	520 mm / Ø3 – 380 mm
HELITRONIC VISION DIAMOND 400	P R	HSS TC C/C CBN PCD	370 mm / Ø3 – 315 mm
HELITRONIC VISION DIAMOND 400 L	P R	HSS TC C/C CBN PCD	420 mm / Ø3 – 315 mm

Software – The intelligence of tool machining and measuring for production and regrinding

Customer Care – Comprehensive range of services

Grinding – Grinding of indexable inserts

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
PROFILE LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø50 mm
COMPACT LINE	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
INSERT LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø75 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Laser – Laser machining of indexable inserts and/or rotationally symmetrical tools

EWAG machines	Use	Materials	Tool dimensions [1] max. length / diameter
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm

Measuring – Contactless measurement of tools, workpieces and grinding wheels

WALTER machines	Use	Tool dimensions [1] max. length / diameter
HELICHECK PRECISION	M	420 mm / Ø1 – 320 mm
HELICHECK ADVANCED	M	420 mm / Ø1 – 320 mm
HELICHECK PRO	M	300 mm / Ø1 – 200 mm
HELICHECK PRO LONG	M	730 mm / Ø1 – 200 mm
HELICHECK PLUS	M	300 mm / Ø0.1 – 200 mm
HELICHECK PLUS LONG	M	730 mm / Ø0.1 – 200 mm
HELICHECK 3D	M	420 mm / Ø3 – 80 mm
HELISET PLUS	M	400 mm / Ø1 – 350 mm
HELISET	M	400 mm / Ø1 – 350 mm

Use: P Production R Regrinding M Measuring

Materials: HSS High speed steel TC Tungsten carbide C/C Cermet/ceramics CBN Cubic boron nitride PCD Polycrystalline diamond CVD-D Chemical vapour deposition MCD/ND Monocrystalline diamond/natural diamond

[1] Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.
[2] From the theoretical taper diameter of the workpiece holder.

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RS 15

The universal machine
for all tool types

Key parameters

The RS 15 is a manual universal grinding machine with integrated measuring device for rotationally symmetrical tools and indexable cutting inserts as individual pieces or low volume production. It machines tools up to 25 mm perimeter diameter for replaceable cutting inserts and up to 200 mm diameter for rotationally symmetrical tools.

EWAG

Ewag AG

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RS 15

The RS 15 six-axis universal grinding machine demonstrates how efficient manual high-precision grinding can be. Grinding and measuring in one clamping cycle as well as integrated dressing of the grinding wheels in combination with the fast tool changeover ensure high productivity.


Grinding


Grinding


Measuring

The RS 15 at a glance

Application

- Rotationally symmetrical tools up to 200 mm diameter
- Indexable cutting inserts from 3 mm inside diameter and up to 25 mm perimeter diameter.
- For production and/or regrinding
- Materials include HSS, carbide, cermet, ceramic, CBN, PCD

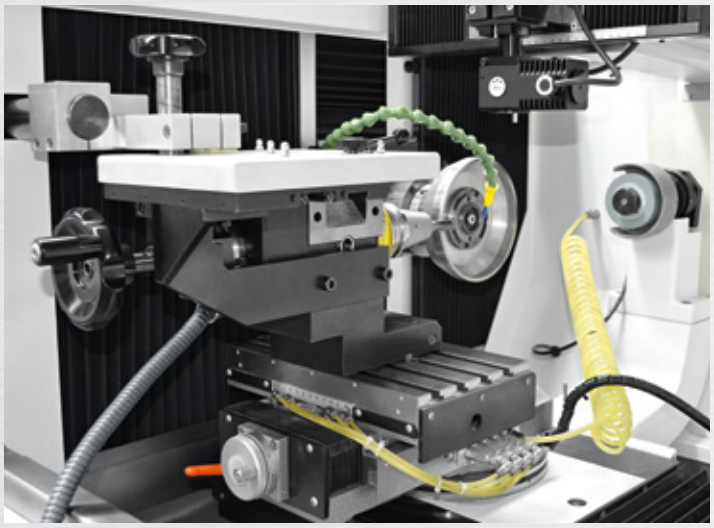
The machine

- Low-vibration grey cast iron machine base
- Linear axes X, Y, Z
- Rotation axes A, B, C
- TA 55 clamping system for rotationally symmetrical tools
- Measuring during the grinding process with projector and digital display
- Grinding and measuring in one clamping
- Integrated dressing of the grinding wheels
- Adjustable grinding pressure for super-hard materials
- Many options and accessories for a wide range of applications available

Universal grinding machine RS 15 for rotationally symmetrical tools and indexable cutting inserts, grinding and measuring in one clamping.

Geometries

- Convex radii and tangents with a constant or variable clearance angle up to 27°
- Constant profiles
- Sphere grinding
- Multi-facet grinding on gun drill



Flexibility through a choice of grinding attachments
The RS 15 can be fitted with grinding attachments for indexable cutting inserts or with a TA 55 dividing head for rotationally symmetrical tools. It can also be fitted with an AWS axis angle grinding attachment for grinding positive and negative angled PCD plates. The operator can freely choose between AWS, TA 55 and indexable cutting insert applications.

Manual and universal

The machine base of the RS 15 enables low-vibration high-precision grinding. Depending on the clamping system, rotationally symmetrical tools and production parts or indexable cutting inserts are produced. Quality consistency is increased by measuring the tool during the production process and also through the integrated dressing of the grinding wheels in combination with the fast tool changeover.

Tool examples:
Grinding on the RS 15

Details and options

Projector as a work coordinator
A projector in the operator's field of vision means that the tool can be visually positioned, measured and monitored in parallel to the grinding operation. This contributes significantly towards the high level of productivity of the RS 15. A camera system can be optionally specified instead of a projector.

1

2

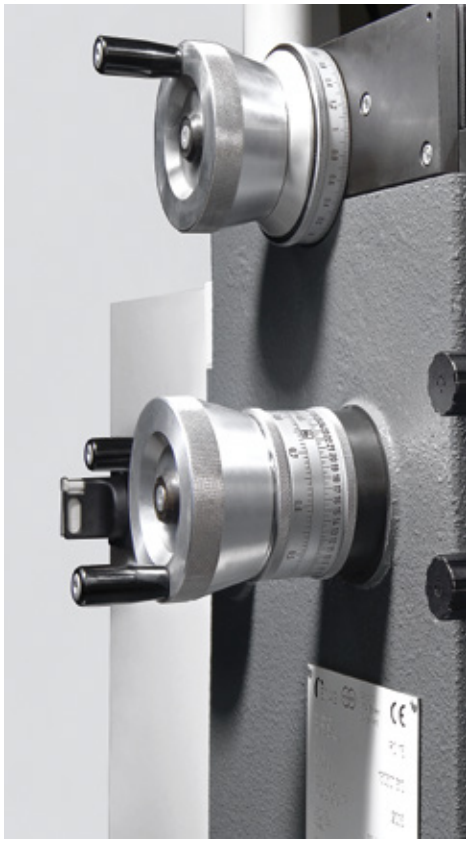
3

Grinding wheel dressing attachment
The integrated dressing attachment dresses the grinding wheel in between tool changes. This increases the precision of the grinding wheels and improves the grinding quality.

Digital display
The operator can see all the positions of the six axes at a glance. He can see what is happening. The reference points can be set quickly and easily using the display.

1 Projector as a work coordinator
2 Grinding wheel dressing attachment
3 Digital display

1



Hand wheels for positioning
The linear axes are positioned in a micron-precise manner using hand wheels, which are within the operator's reach, as well as by using the digital display.

3

4

2

Control panel
Positioned ergonomically within the operator's reach and fitted with the latest electronics and electric technology, the operator can comfortably control the grinding operation from the control panel.

Grinding pressure stabiliser
Constant grinding pressure or contact pressure optimises the removal performance and is mandatory for grinding PCD tools. The operator sets the grinding pressure on the machine.

Tool holder cross table
This is the holder for all clamping systems. Ball screws for low-maintenance linear axes for ultimate precision. These axes can also be fitted with glass scales.

1 Hand wheels for positioning
2 Grinding pressure stabiliser
3 Control panel
4 Tool holder cross table

Accessories for greater flexibility

1

TA 55 universal dividing head
In the basic set-up the dividing head is fitted with a HSK 63 adaption. All the popular clamping systems on the market for rotationally symmetrical tools can be used with the TA 55.

Chamfer grinding attachment
This attachment is used to grind geometrically-precise negative chamfers on indexable cutting inserts.

Universal 3CV clamping table
The tool holders can be tilted in two planes and rotated horizontally on the table. This enables two different clearance angles to be ground perfectly on the respective side.

2

3

1 TA 55 universal dividing head
2 Universal 3CV clamping table
3 Chamfer grinding attachment

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Commissioning
Extension of the guarantee

Qualification
Training
Support for production

Prevention
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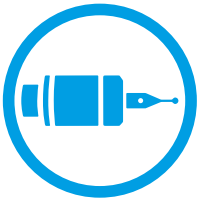
Service
Customer service
Customer advice
Helpline
Remote service



Material
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Technical data, dimensions

Axes

X axis	490 mm
Y axis	130 mm
Z axis	120 mm
A axis	- 10 to + 27°
B axis	235°

Workpiece slide Z

Contact pressure	0 – 400 N

Oscillation on the lateral axis X

Oscillation size	0 – 70 mm
Oscillation frequency	0 – 60 strokes/min

Accuracy

Linear resolution	0.001 mm
Radial resolution	0.01°

Drives

Grinding spindle performance	2.2 kW
Grinding spindle speed	1,000 – 6,000 rpm
Max. grinding wheel diameter	150 mm

Tool data[1)]

Clamping system for indexable cutting inserts

Various shapes and geometries

Clamping system for rotationally symmetrical tools

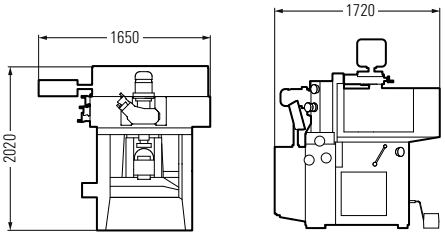
TA 55 dividing head	HSK 63
Axis angle grinding device AWS	HSK 63

Options

- AWS (Axis Angle Grinding attachment)
- Digital display
- Camera system/250 mm projector
- Dressing attachment
- Regeneration unit for grinding wheels

Accessories

- Clamping sets (HSK 63/ ISO40/ W31.75/ W25/ W20/ DSF-M)
- TA 55 dividing attachment
- Spherical grinding device 20 – 500 rpm
- Various grinding flanges
- Universal 3CV clamping table
- Chamfer grinding attachment
- Radius grinding device R150 – 400 mm
- Coolant system
- Coolant (emulsion)
- Additional accessories upon request



RS 15

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Grinding – Grinding of rotationally symmetrical tools and workpieces

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC ESSENTIAL	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI POWER	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI AUTOMATION	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC BASIC	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER 400	P R	HSS TC C/C CBN	520 mm / Ø3 – 315 mm
HELITRONIC VISION 400	P R	HSS TC C/C CBN	370 mm / Ø3 – 315 mm
HELITRONIC VISION 400 L	P R	HSS TC C/C CBN	420 mm / Ø3 – 315 mm
HELITRONIC VISION 700 L	P R	HSS TC C/C CBN	700 mm / Ø3 – 200 mm
HELITRONIC MICRO	P	HSS TC C/C CBN	120 mm / Ø0.1 – 12.7 mm
	R	HSS TC C/C CBN	120 mm / Ø3 – 12.7 mm

EWAG machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	200 mm / Ø0.2 – 200 mm
PROFILE LINE	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
WS 11/WS 11-SP	P R M	HSS TC	– / up to Ø25 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Eroding – Electrical discharge machining and grinding of rotationally symmetrical tools

WALTER machines	Use	Materials	Tool dimensions [1] max. length [2] / diameter
HELITRONIC DIAMOND EVOLUTION	P R	HSS TC C/C CBN PCD	185/255 mm / Ø1 – 165 mm
HELITRONIC POWER DIAMOND	P R	HSS TC C/C CBN PCD	350 mm / Ø3 – 290 (400) mm
HELITRONIC POWER DIAMOND 400	P R	HSS TC C/C CBN PCD	520 mm / Ø3 – 380 mm
HELITRONIC VISION DIAMOND 400	P R	HSS TC C/C CBN PCD	370 mm / Ø3 – 315 mm
HELITRONIC VISION DIAMOND 400 L	P R	HSS TC C/C CBN PCD	420 mm / Ø3 – 315 mm

Software – The intelligence of tool machining and measuring for production and regrinding

Customer Care – Comprehensive range of services

Grinding – Grinding of indexable inserts

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
PROFILE LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø50 mm
COMPACT LINE	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
INSERT LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø75 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm

Laser – Laser machining of indexable inserts and/or rotationally symmetrical tools

EWAG machines	Use	Materials	Tool dimensions [1] max. length / diameter
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm

EWAG machines	Use	Materials	Indexable inserts [1] Inscribed / circumscribed circle
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm

Measuring – Contactless measurement of tools, workpieces and grinding wheels

WALTER machines	Use	Tool dimensions [1] max. length / diameter
HELICHECK PRECISION	M	420 mm / Ø1 – 320 mm
HELICHECK ADVANCED	M	420 mm / Ø1 – 320 mm
HELICHECK PRO	M	300 mm / Ø1 – 200 mm
HELICHECK PRO LONG	M	730 mm / Ø1 – 200 mm
HELICHECK PLUS	M	300 mm / Ø0.1 – 200 mm
HELICHECK PLUS LONG	M	730 mm / Ø0.1 – 200 mm
HELICHECK 3D	M	420 mm / Ø3 – 80 mm
HELISET PLUS	M	400 mm / Ø1 – 350 mm
HELISET	M	400 mm / Ø1 – 350 mm

Use: P Production R Regrinding M Measuring

Materials: HSS High speed steel TC Tungsten carbide C/C Cermet/ceramics CBN Cubic boron nitride PCD Polycrystalline diamond CVD-D Chemical vapour deposition MCD/ND Monocrystalline diamond/natural diamond

[1] Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.
[2] From the theoretical taper diameter of the workpiece holder.

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