

# 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.



Grinding



Eroding



Laser



Measuring



Software



Customer Care

## Ewag AG

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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

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- 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

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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.

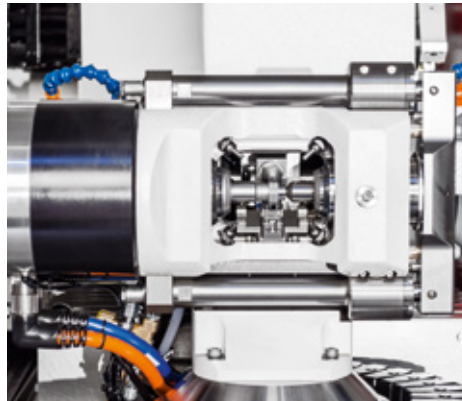
## Direct drive clamping system

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.

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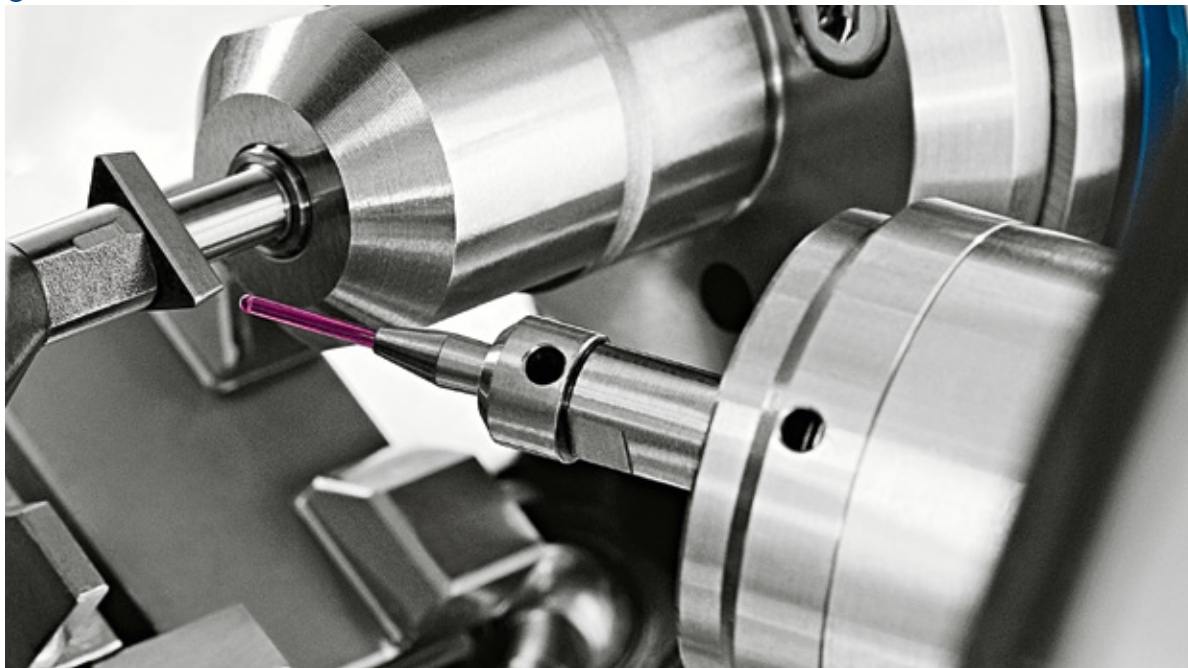


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#### Technology for productivity:

- 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.

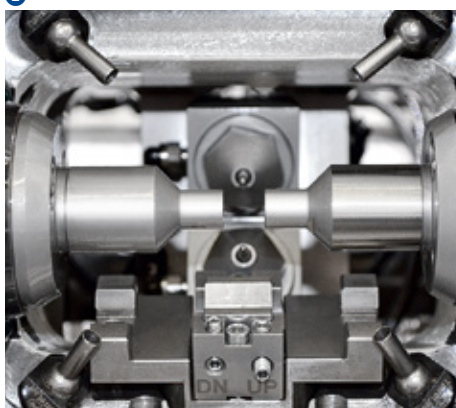
### In process measuring system

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.

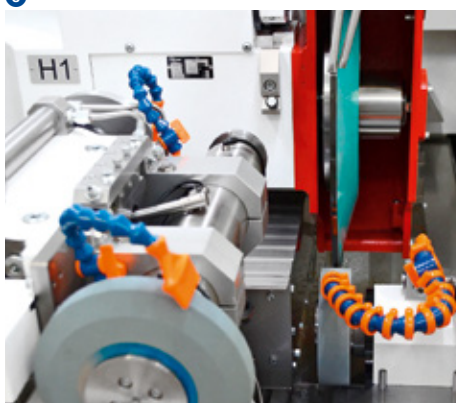
### Dressing-Plus

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.

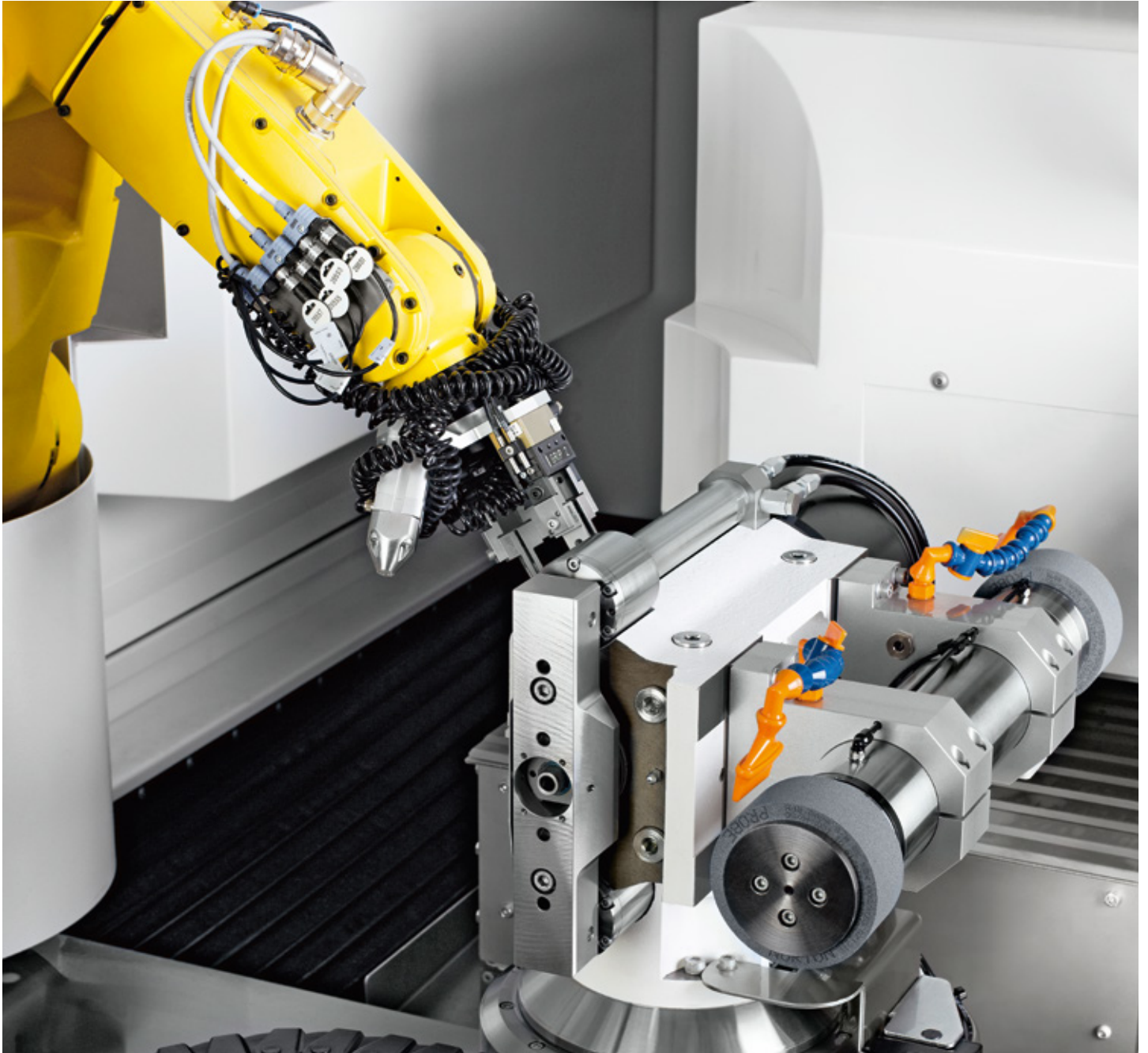
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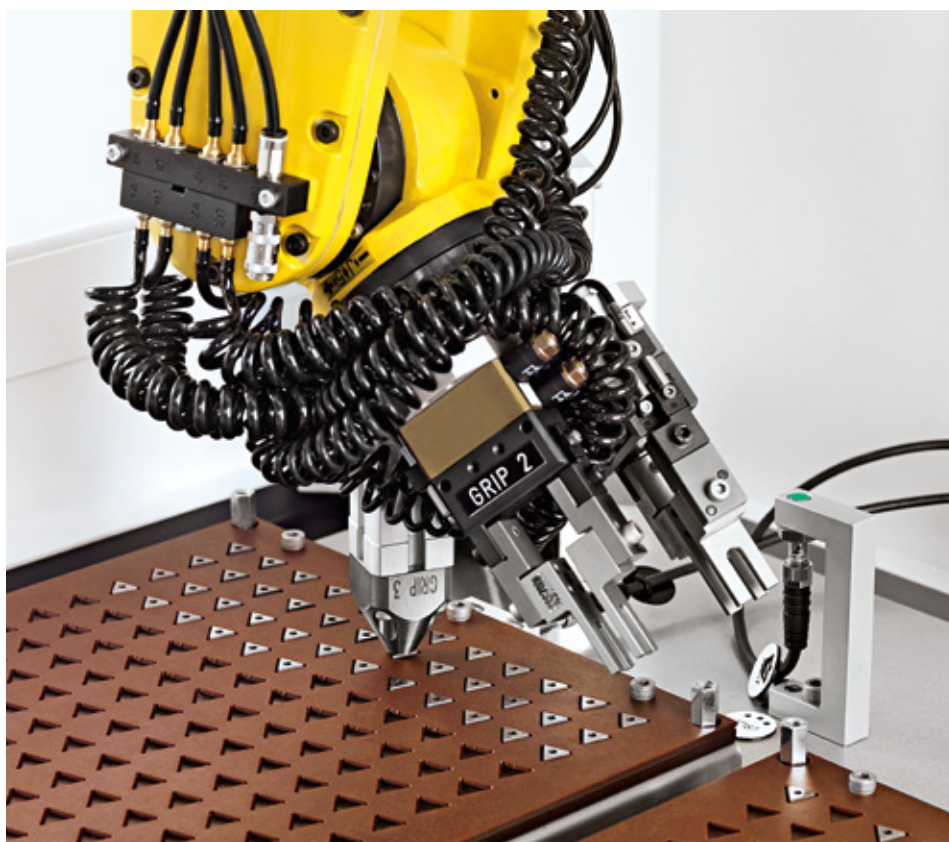
## Experience and expertise in tool handling



### **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.



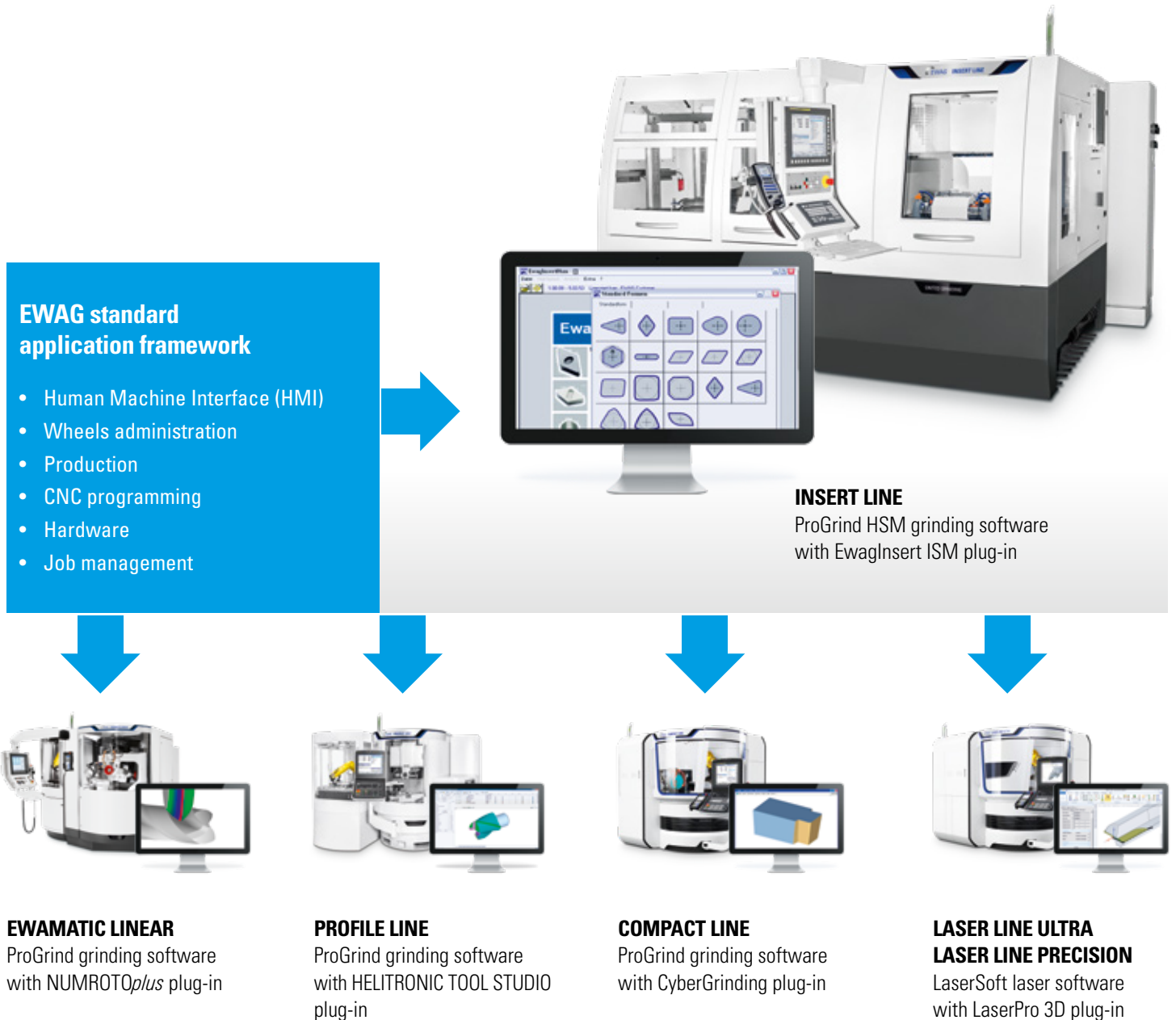
### Vision system

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!

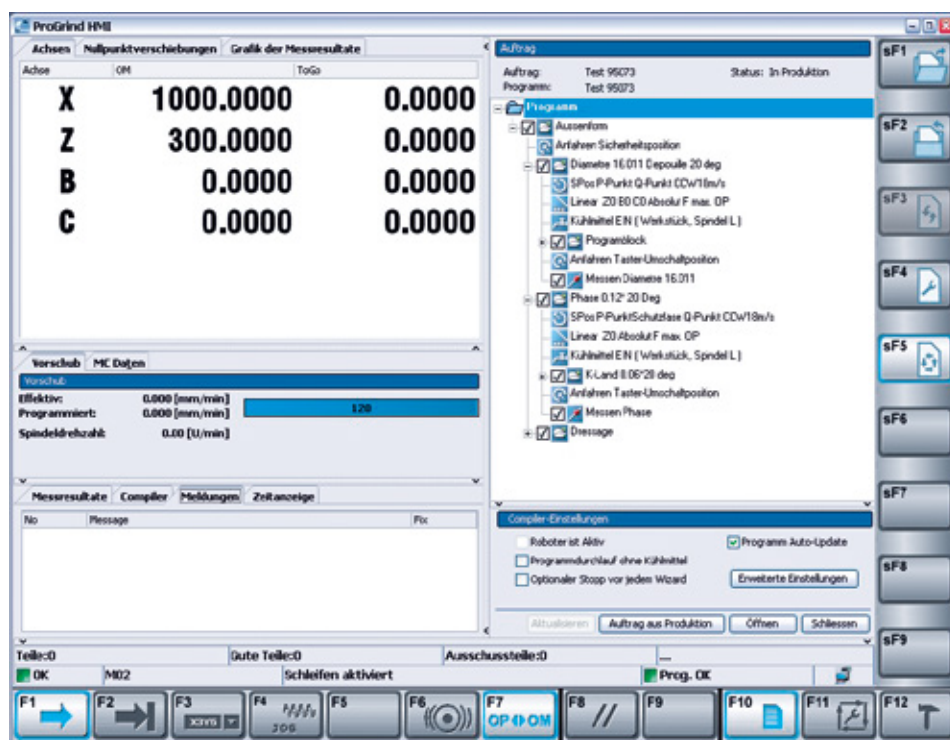
Innovation demands innovative software. As customer-centric software from EWAG, ProGrind meets all your exacting demands. Programs can be created quickly and easily on all EWAG CNC machines with ProGrind. The input screens feature 3D graphics. The machines can be integrated within your company network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





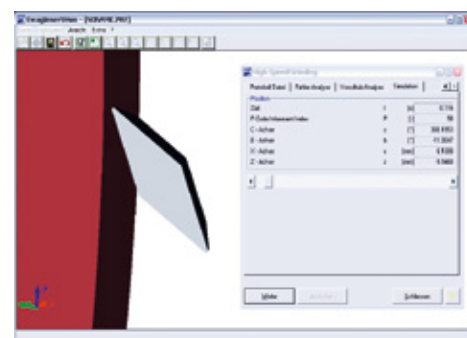
### Human machine interface HMI

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.

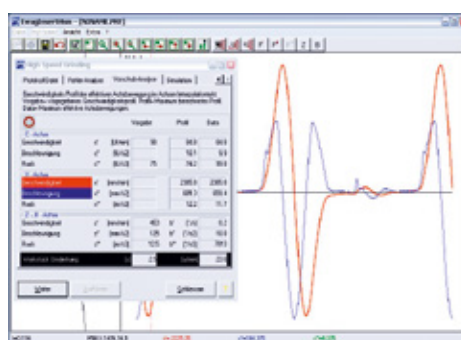


### 3D simulation

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.

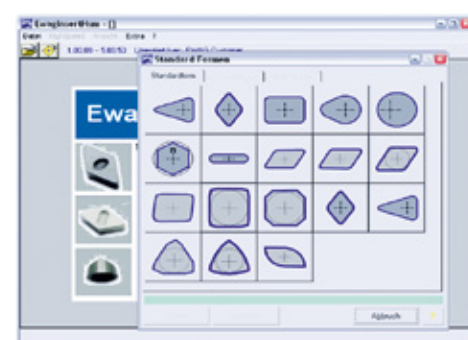


- ISO geometric shapes via input screens
- 3D simulation
- Effective HSM analysis tool
- Standard EWAG human machine interface



### 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.



# 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



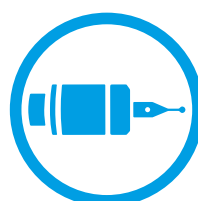
**Qualification**  
Training  
Support for production



**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, 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

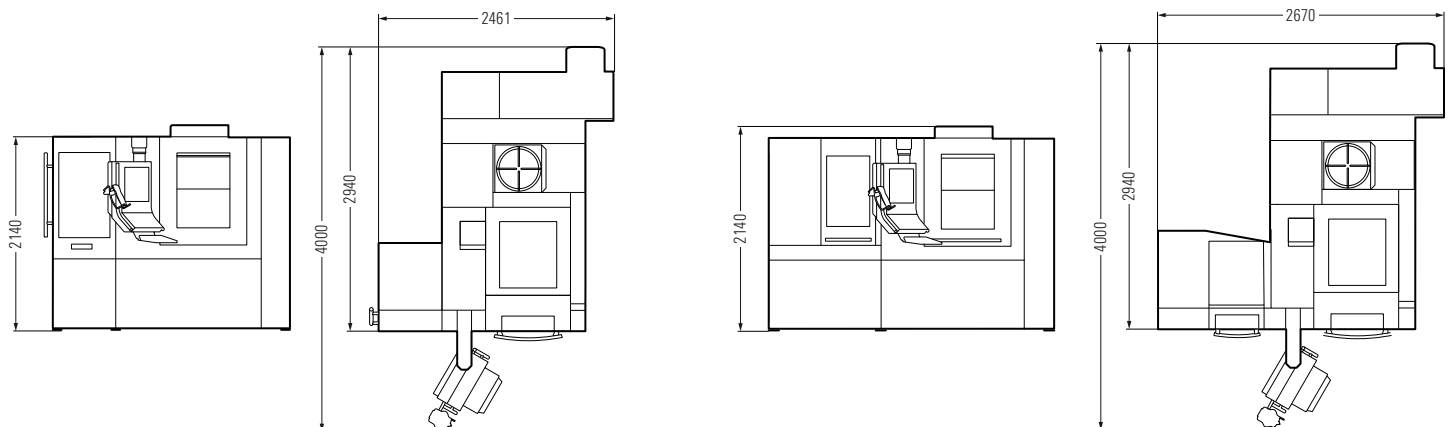
## Tool data<sup>1)</sup>

### 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



<sup>1)</sup> 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.



# 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 <sup>1)</sup> max. length <sup>2)</sup> / 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 R	HSS TC C/C CBN HSS TC C/C CBN	120 mm / Ø0.1 – 12.7 mm 120 mm / Ø3 – 12.7 mm

EWAG machines	Use	Materials	Tool dimensions <sup>1)</sup> max. length <sup>2)</sup> / 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 <sup>1)</sup> max. length <sup>2)</sup> / 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

**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



## Grinding – Grinding of indexable inserts

EWAG machines	Use	Materials	Indexable inserts <sup>1)</sup> 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 <sup>1)</sup> 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 <sup>1)</sup> 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 <sup>1)</sup> 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
HELISSET PLUS	M	400 mm / Ø1 – 350 mm
HELISSET	M	400 mm / Ø1 – 350 mm

<sup>1)</sup> Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.

<sup>2)</sup> From the theoretical taper diameter of the workpiece holder.









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