



G 250 / G 450  
generating and profile gear grinding machine

## G 250 / G 450 generating and profile grinding machine



The SAMPUTENSILI G 250 / G 450 is a machine platform, available in two sizes, based on established concepts of the best-selling SAMPUTENSILI S 250/400 G machine, which have been further enhanced and improved. The result is an innovative, compact and extremely flexible gear grinding machine.

The SAMPUTENSILI G 250 / G 450 has been especially developed for very low cycle times and for top-quality and efficient mass production of gears with outside diameters up to 250 mm (450 mm for the bigger size) and shafts with lengths up to 550 mm.

Particular attention has been paid to the state-of-the-art solutions that allow a fast tool change.

The machine can equally use form and worm grinding wheels, both in ceramic and in electroplated CBN.

Simple design concepts in terms of tooling and dressing technology, fast automation and amazing user-friendliness are the strengths behind this unique machine.



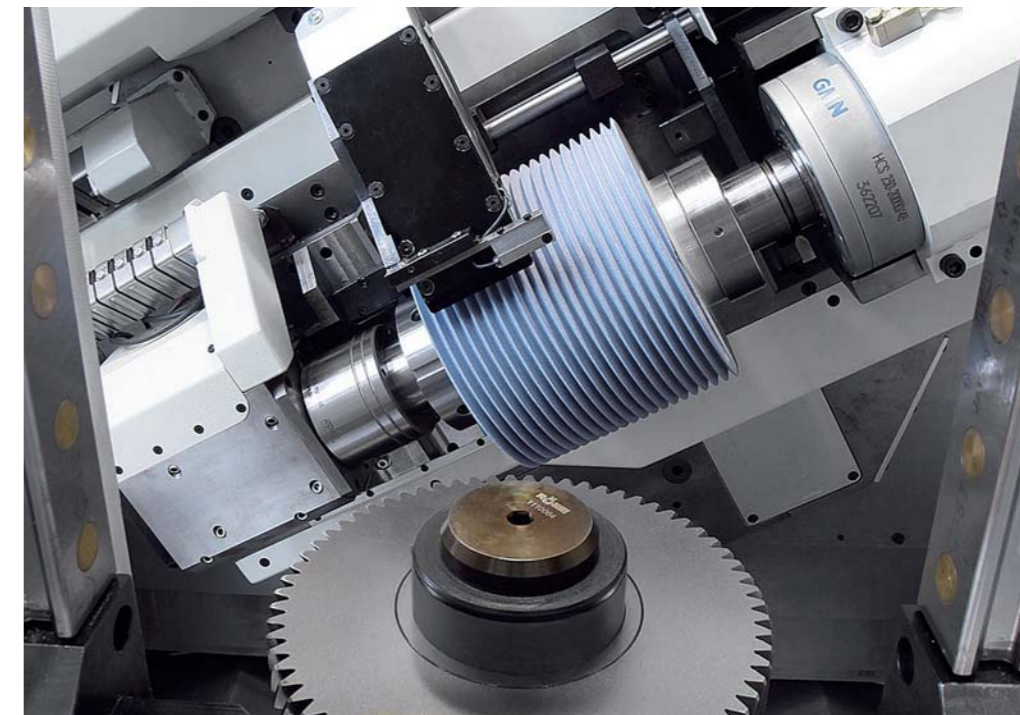
## Gear grinding: maximum efficiency with safe investments

The grinding spindle with its specifically large tool capacity allows the use of long grinding worms to raise the tool life of single or combination worms of roughing and finishing tools employing electroplated CBN or ceramic bound grinding worms and wheels. So you can always rely on the most efficient technology or the most beneficial combination to complete your grinding task.

Due to the extremely high rotational and linear accelerations with their appropriate absolute speeds the machine guarantees excellent cycle times and is perfectly suited to benefit from future developments in the grinding tool sector.



Universal quick change clamping systems for mass production environments allow rapid tool change so valuable grinding time is never compromised.



Optimised direct drives for tool and work spindle with independent refrigerating circuits.

Large tool capacity

New enlarged workarea capacity

Electroplated CBN and dressable corundum tools

Grinding worms and wheels on one spindle

Standard tool clamping systems and workpiece fixtures

### at a glance

+ Tailored solutions for each application

+ Grinding of every kind of workpieces and complex geometries

+ Power and speed reserves for future tool developments

+ Simple, stabile and flexible workholding solutions

+ Automatic balancing unit integrated in the tool holder

## G 250 Dual work spindles concept for maximum productivity and flexibility

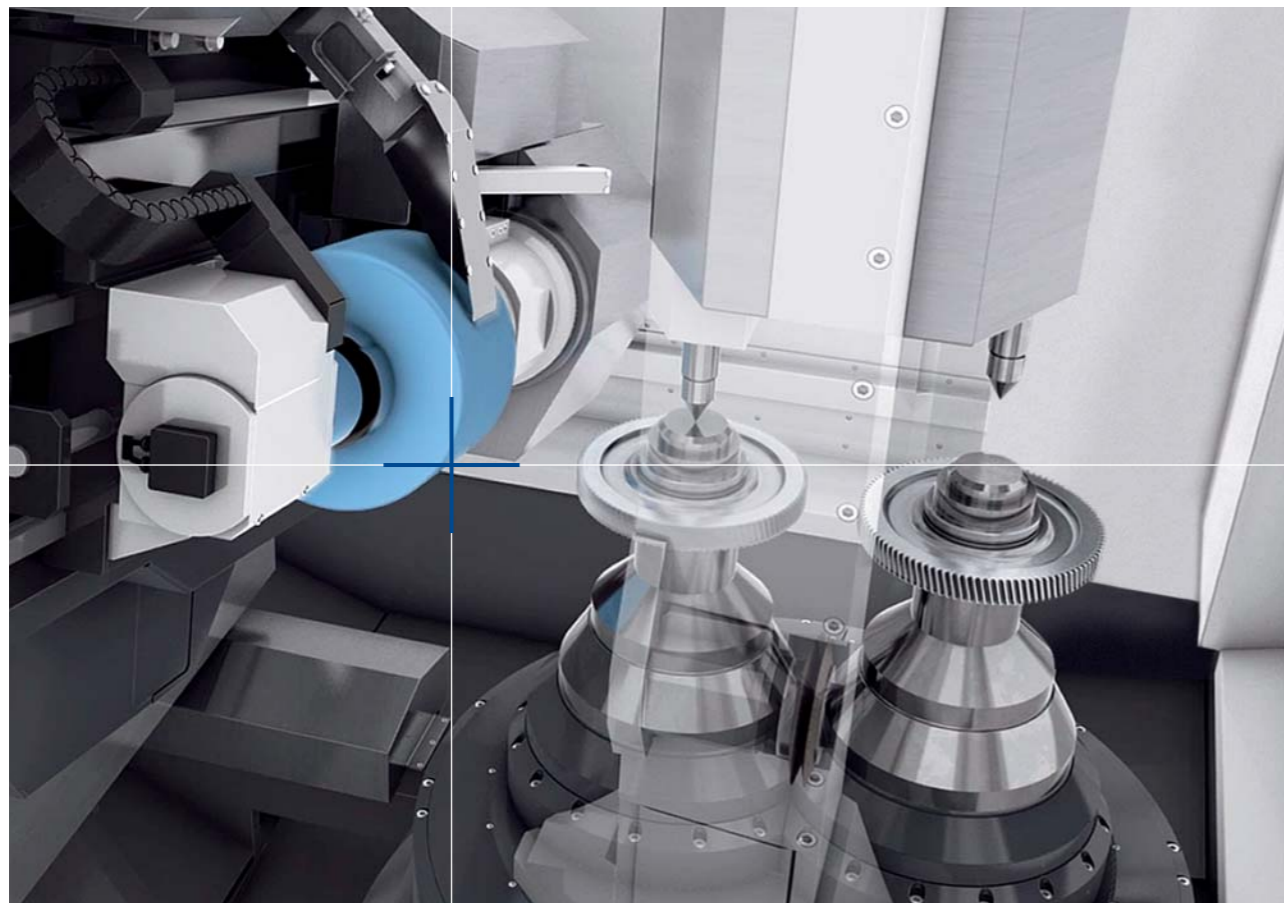
The G 250 machine features a dual work spindle concept, which eliminates non-productive auxiliary times almost completely, thus raising the efficiency of your production.

By means of the dual work spindles, the loading/unloading process of a workpiece is carried out in masked time, while simultaneously the manufacturing process proceeds on another workpiece.

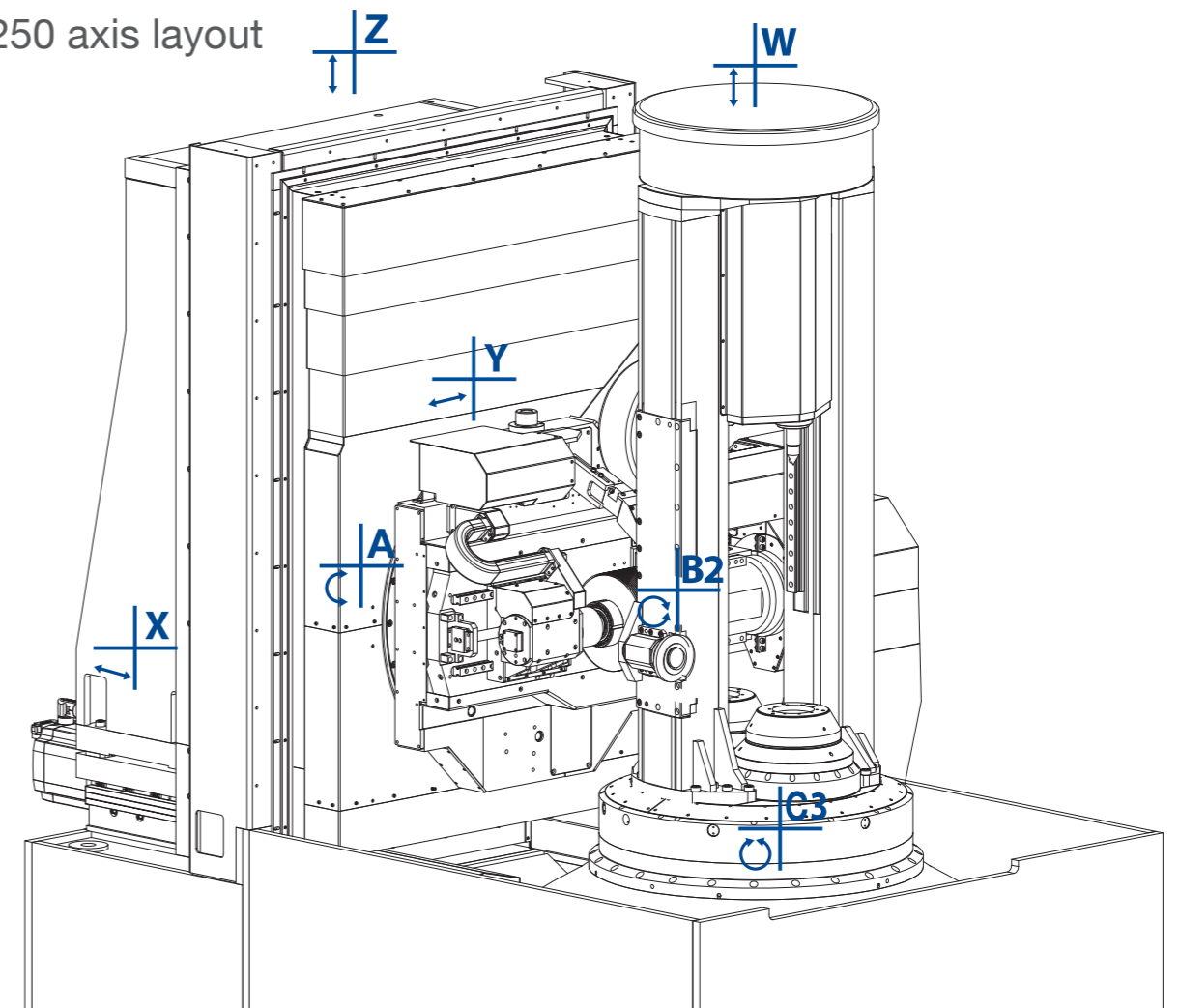
Unlike other applications, the gear meshing is conveniently carried out directly in the grinding position for better accuracy purposes and very high change-over flexibility. Indeed, only in this position the meshing can be achieved with a micron-level accuracy.

### at a glance

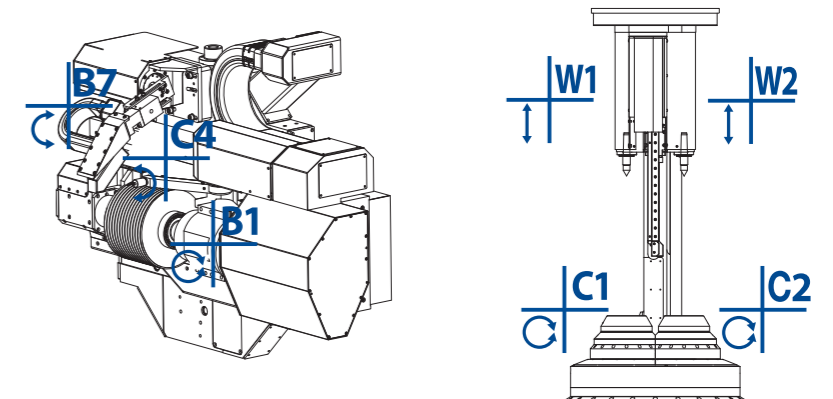
- + Loading/unloading of the workpiece in masked time
- + Optional automatic workpiece loading/unloading
- + Semi-automatic tool change



G 250 axis layout



- X Radial movement tool column
- Y Tangential movement tool head
- Z Vertical movement tool head slide
- A Swivel tool head
- B1 Rotation tool spindle
- B2 Rotation movement dressing spindle
- B7 Swivel coolant nozzle
- C1 Rotation workpiece spindle 1
- C2 Rotation workpiece spindle 2
- C3 Rotation worktable
- C4 Rotation checking unit
- W Vertical movement tailstock positioning
- W1 Vertical movement tailstock 1
- W2 Vertical movement tailstock 2



## G 450 Work spindle concept

The G 450 is synonymous with maximum flexibility and high ergonomics, and has been especially engineered for small-medium production lots.

As a result, the G 450 works using a single worktable, which – as in the case of the G 250 – is mounted on the rotating table. This feature simplifies the loading/unloading as well as the tooling operations.

During the workpiece changeover, the grinding wheel keeps rotating and the oil jet is constant.

Keeping the machine at operating speed gives advantages in terms of thermal and mechanical stability of the machine parts.

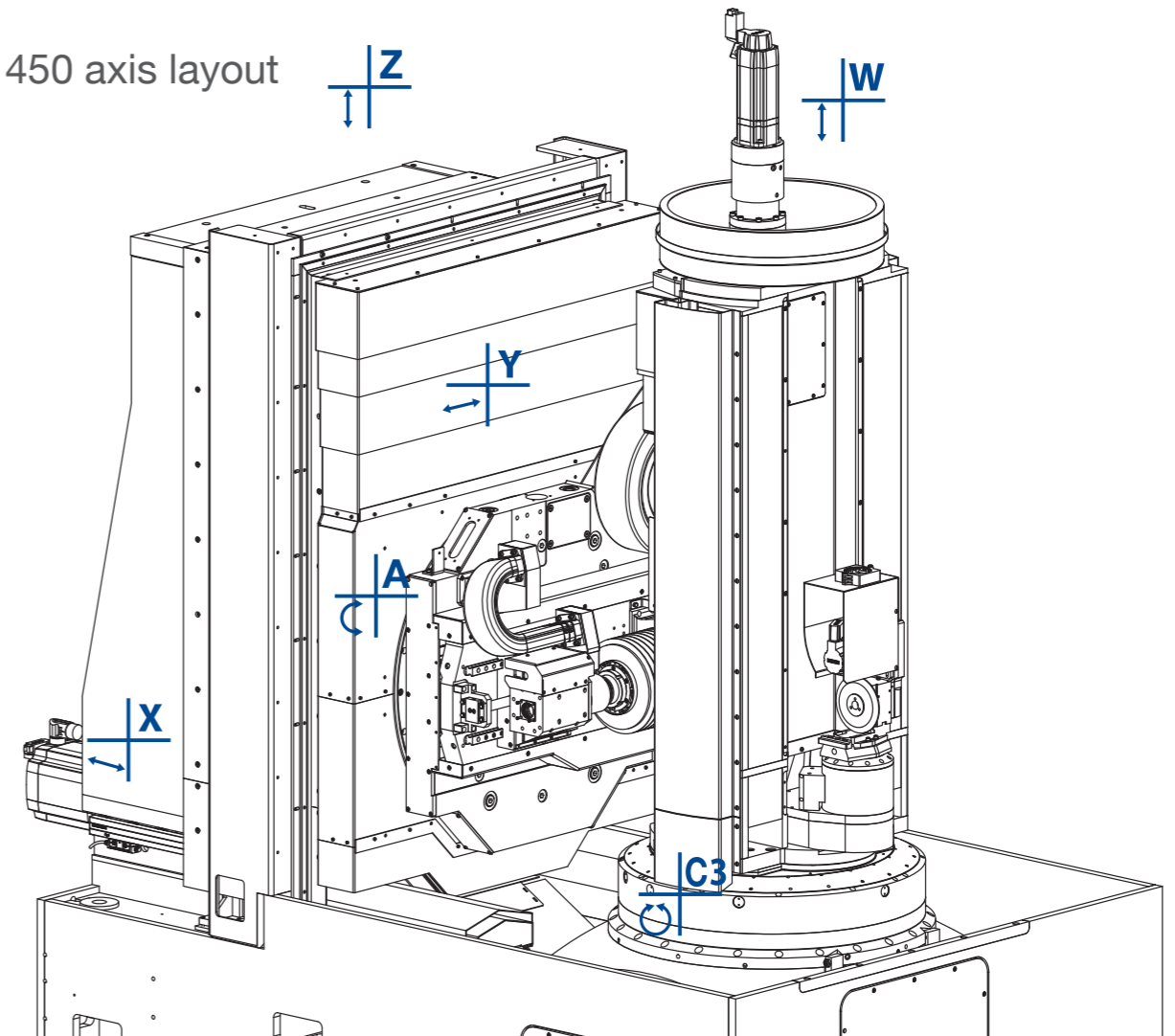
On the same rotating table, but diametrically opposite the work spindle, an innovative and patent-pending dressing system ensures a very high process flexibility.

### at a glance

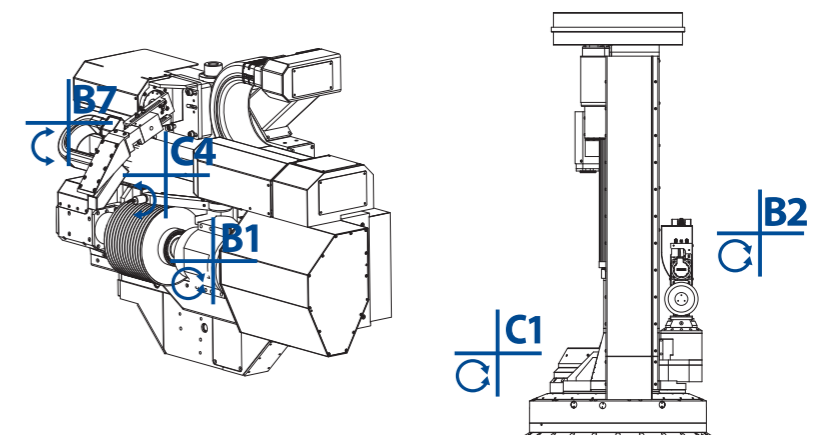
- + ideal for small-medium production lots
- + easy loading/unloading and tooling operations
- + high thermal and mechanical stability



## G 450 axis layout



- X Radial movement tool column
- Y Tangential movement tool head
- Z Vertical movement tool head slide
- A Swivel tool head
- B1 Rotation tool spindle
- B2 Rotation movement dressing spindle
- B7 Swivel coolant nozzle
- C1 Rotation workpiece spindle
- C3 Rotation worktable
- C4 Rotation checking unit
- W Vertical movement tailstock positioning

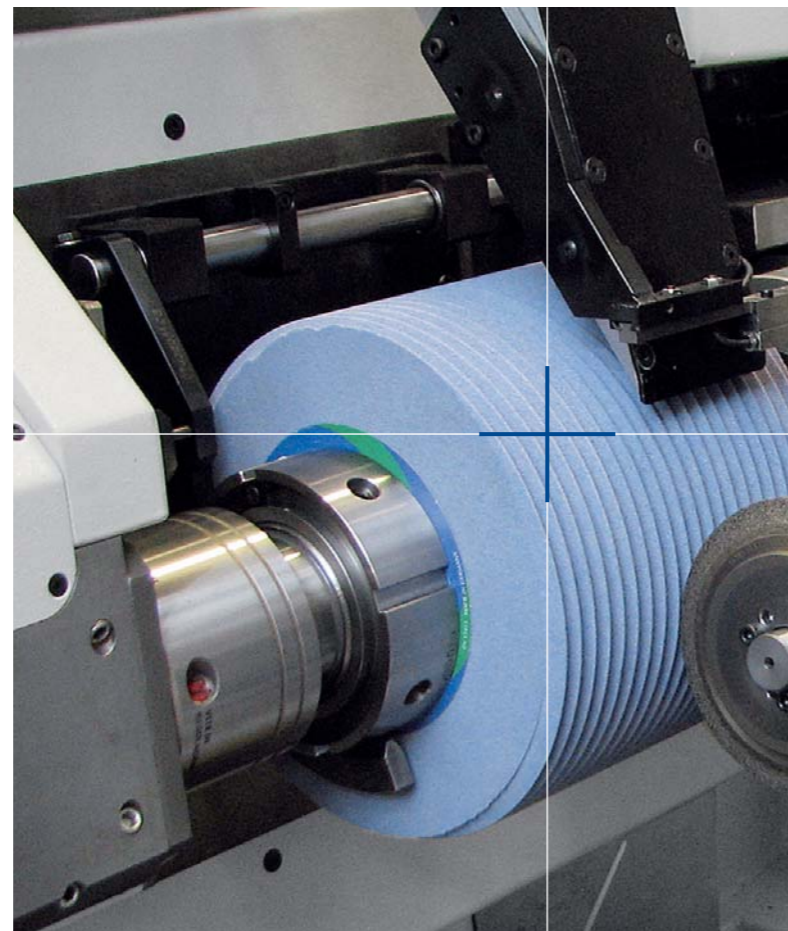


## Dressing for flexible efficiency via standard dressing rolls

The dressing unit consists of a diamond dressing roll mounted on a dedicated spindle, which is located on the rotating table structure. An optional diamond OD dressing tool can be mounted on the dressing unit structure, in order to have the necessary flexibility to dress the OD of the grinding wheel.

If the tooth root diameter must be ground as well, a tip radius dressing roll is applied to create the required tip radius on the grinding tool. When required, the dressing unit is automatically brought into the working position by the rotating movement of the worktable. This guarantees an extremely precise and rigid positioning, which is of fundamental importance in order to obtain an excellent result. The dressing movements are actuated by the interpolation of the axes.

The possibility to use generic profile dressing rolls on the machine allows you to save money and guarantees a fast supply of dressing tools. You may employ both single and double flank dressing rolls, as well as multi-rib type.



## Automation options: maximum productivity with minimum auxiliary times

Depending on your application, the G 250 / G 450 machine can be easily equipped with various automation solutions to produce parts in small and large quantities, with shorter lead times, preserving high quality at lower costs.

The G 250 / G 450 can be linked for example to a robotic arm, which is normally installed next to the machine and manages the loading and unloading process of workpieces. Optionally a pallet storage solution can be integrated for a continuous workflow without any interruptions.

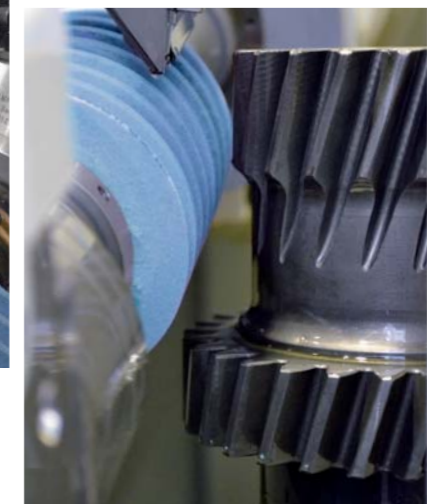


## Integrated inspection unit

A hydraulically actuated swivelling arm brings the inspection probe into position and retracts it from the working area during the grinding process; profile, lead and pitch inspection is performed. Results may be directly printed or stored on a memory device.

### At a glance

- + Completely integrated process with centralised control
- + Direct inspection sheet print-out
- + Checking unit retracted from workarea during grinding



## Highlights

In the G 250 / G 450 the minimum axis distance between worktable and grinding wheel is 40 mm, and its grinding spindle can achieve 12.000 rpm. Due to the combination of these two unique features, the grinding process is also possible using profile/threaded grinding wheels with very small outside diameter, mounted on the main spindle. Workpieces with tool diameter limitations, for example shoulder-type gears, can be ground with a grinding wheel down to 90 mm.



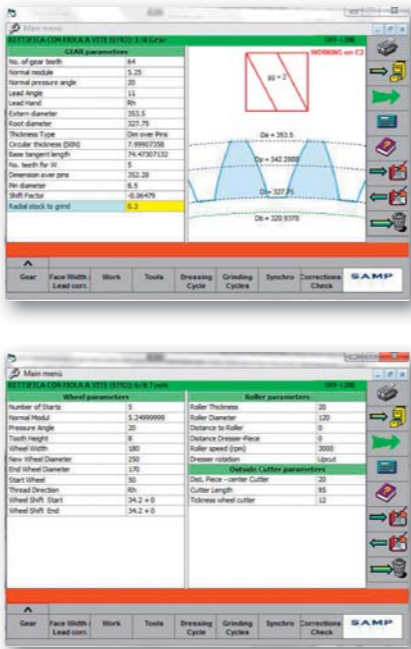
Similarly, double and triple pinions with very small distances can be ground with the proper tooth-to-tooth alignment.

To grind gears very close to a shoulder and to improve the productivity of the machine Samputensili developed a new solution combining an high speed electrospindle and long axis travel: G250HS. With this machine it is possible to use profile grinding wheels down to 30 mm and generating grinding wheels down to 68 mm.



### At a glance

- + Minimum axis distance between small worktable and grinding spindle
- + High speed grinding spindle
- + Small profile/threaded grinding wheel on the main spindle
- + HS version: electrospindle for profile grinding wheels with outside diameter down to 30 mm and generating grinding wheels down to 68 mm



Technical data

Workpiece diameter, max. (G 250 / G 450)	mm	250 / 450
Module	m <sub>n</sub>	0.5 - 7.0
Workpiece length, max.	mm	550 / 650
Face width, max.	mm	400
Helix angle	degree	+45° / -45°
Grinding wheel dia.	mm	250 / 170 or 120 / 90
Grinding wheel width, max.	mm	180
Grinding speed, max.	m/s	80
Dressing tool dia.	mm	120
Machine overall dimensions L x W x H	mm	4,120 x 2,200 x 2,700
Controls		Siemens 840 D Solution Line

Technical data subject to change.

Latest Siemens drive technology and Samputensili Menu guidance ensure maximum process security.

Samputensili correction software allows the immediate correction of profile slope errors by redressing the grinding wheel.

- Samputensili menu-guided operator interface with simulation capability

Modular software packages including profile correction modules

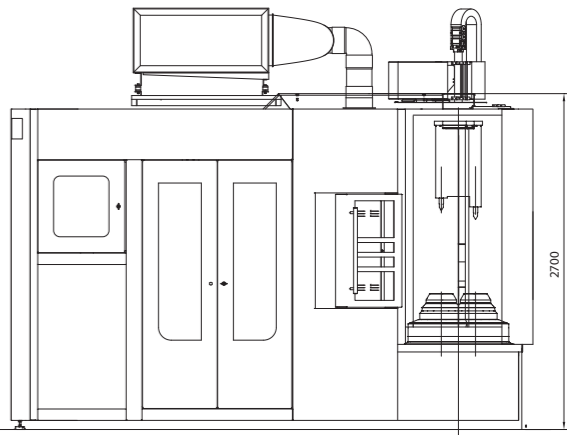
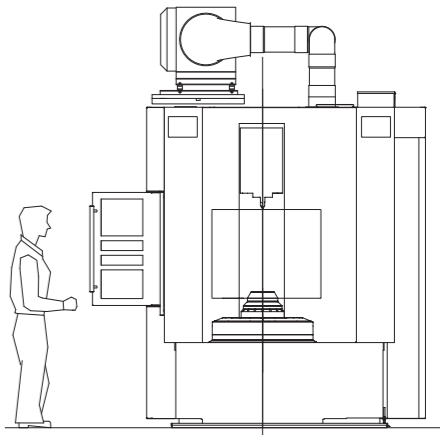
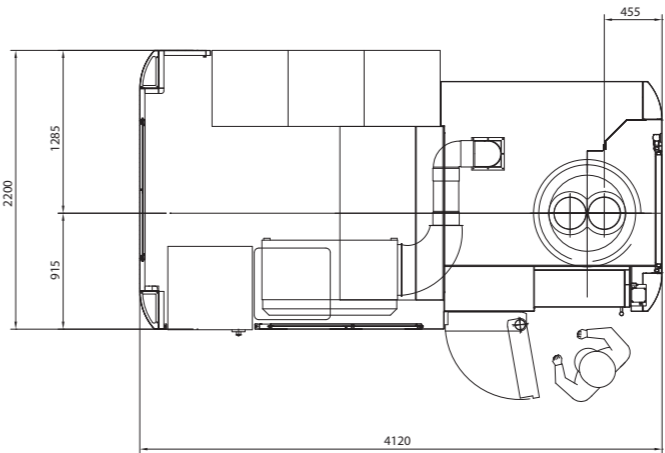
Direct networking, USB interface included

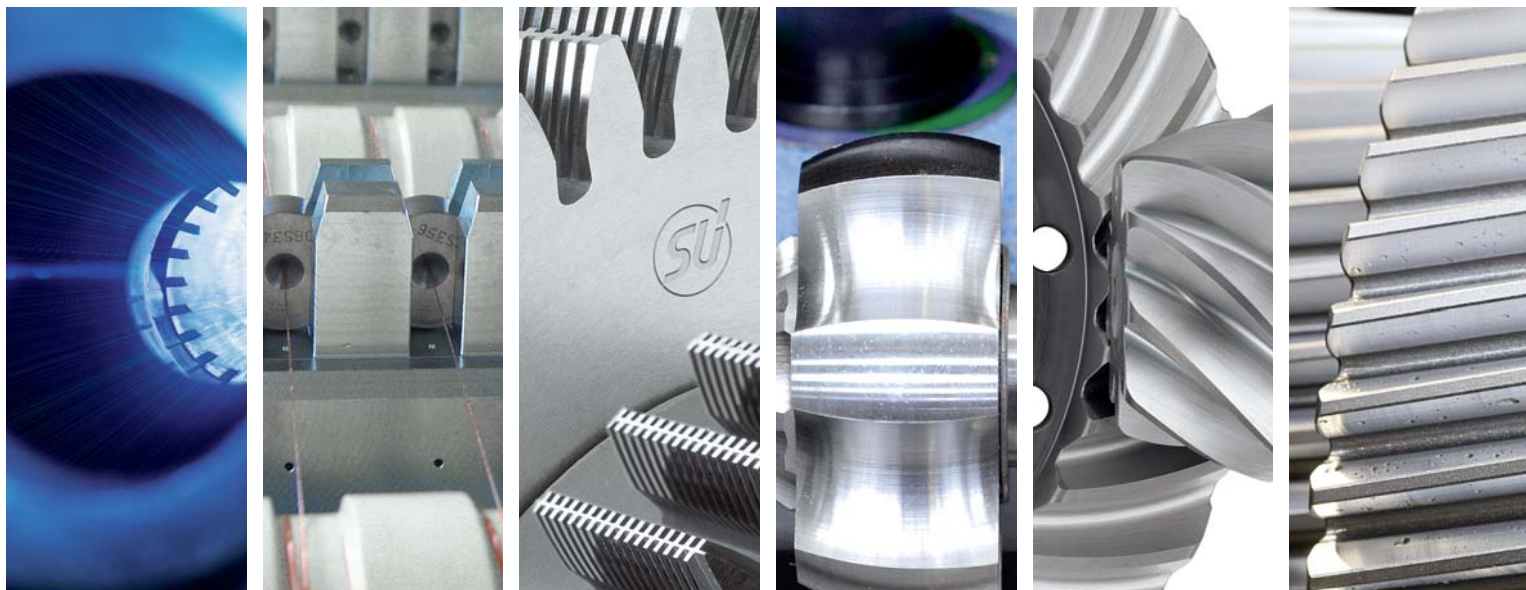
True Windows® environment
- at a glance

+ Fast data validation and error correction

+ Easy and intuitive operation

+ Faster data transfer to machine





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