



Gleason

Gleason - PFAUTER

P 90 G
Grinding and
Hobbing Machine

KEEPING THE WORLD IN MOTION™

P 90 G – three grinding methods + hobbing combined in one machine.

The P 90 G is a new development based on the proven P 90 Hobbing Machine platform.

The P 90 G is a universal machine providing three grinding methods.

In addition to hobbing it will meet requirements for prototype, small and large volume production.

The P 90 G machine is capable of hobbing and grinding spur and helical gears and pinions up to module 3 mm*, and single and multi-thread worms up to module 5 mm* in a range of diameters up to 100 mm*. Various designs of grinding tools made of non-dressable CBN are used. A variety of processes and software options is available, depending on the users' individual requirements.

Standard features

- **Grinding head** with infinitely variable high-speed direct drive and maintenance-free bearings. Spindle with hob arbor taper or with straight bore and collet chuck for shank-type hobs.
- **Work spindle** with maintenance-free direct drive.
- **Work area guarding** made of stainless steel with steep angles for optimum chip disposal.
- **Integrated hydraulic unit** for hob and workpiece clamping.
- **Siemens numerical control** of the latest generation with 12" flat color monitor integrated in a 19" control panel.
- **Gleason-Pfauter operator interface**, menu-assisted and shop-oriented programming with operator-friendly help functions and service support.
- **Digital drive technology** on all axes with integrated gear interpolation functions.
- **Absolute measuring systems.**
- **Machine** meets all the relevant standards and is CE certified.

Special features/options

- **Electronic handwheel.**
- **Remote diagnostics system** via modem.
- **Loading systems available:**
 - H grippers
 - rotational grippers
 - NC gantry loader for workpieces up to 7 kg.
- **Power clamping equipment.**
- **Deburring unit.**
- **Motorized safety withdrawal** for effective protection of machine and tool.
- **Meshing/stock division.**
- **Magnetic/scrapper conveyor** or coalescing filter with chip box.
- **Coolant system.**
- **Oil mist separator.**
- **Workholding equipment for workpieces.**
- **Other accessories available on request.**



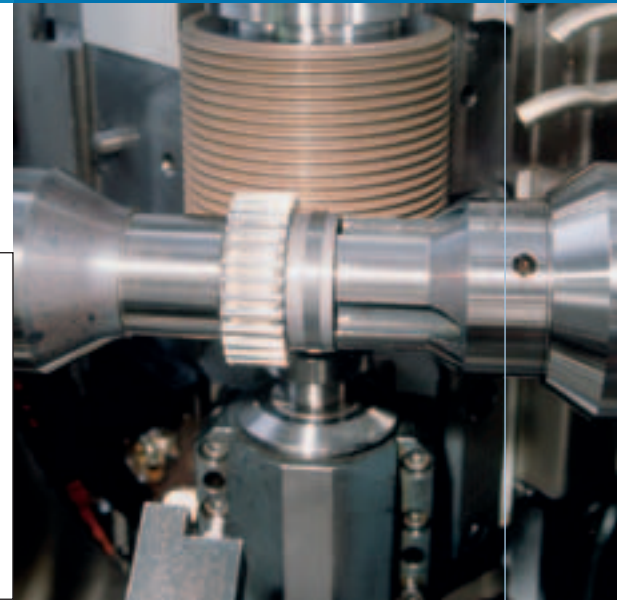
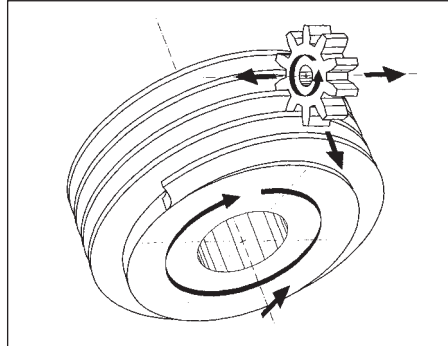
* Standard values – deviations or restrictions may result from machine features, workpiece clamping or machining methods and require technical clarification.

Threaded wheel grinding.

Grinding using single or multi-thread CBN grinding worms. If required, several grinding worms can be mounted on one arbor for roughing and finishing, thus machining the workpiece in one setting. The option of using small-diameter grinding wheels allows workpieces to be ground with limited approach and overrun distances.

The machine is programmed by means of a user-friendly dialog system. In the basic version, several

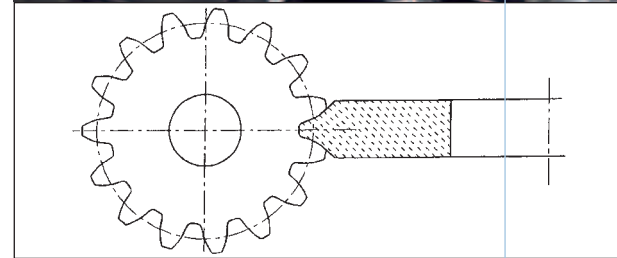
options are available for lead modifications, such as crowning or taper.



Profile grinding.

Single – index form grinding. CBN profile grinding wheels are shaped to suit the desired tooth form. Profile modifications (e.g. tooth tip chamfer or profile crowning) are incorporated directly into the grinding wheel. Lead modifications such as crowning or taper, can be programmed directly via the CNC dialog. The possibility of using small-diameter grinding wheels allows workpieces to be ground with limited approach and overrun distances.

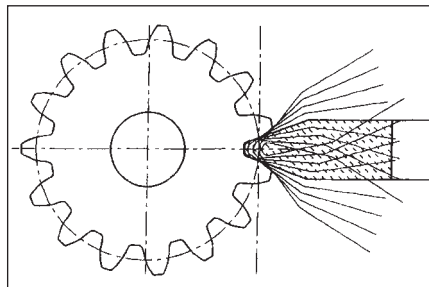
The process is divided into a roughing and a finishing operation. A specific software package provides a variety of standard options for selection (e.g. multiple-flank roughing, dual-flank finishing) and cycles (e.g. random indexing cycle). The precise positioning of the grinding wheel is supported by a special function in the software and this considerably reduces set-up time.



Indexing generation grinding.

Single – index generation grinding using a module-independent CBN wheel. The grinding wheel is based on the profile of the rack (standard basic rack tooth profile); the form angle of the grinding wheel does not have to be identical to the pressure angle of the gear to be ground. This fact makes the method of particular interest for grinding prototypes and small volumes. Arranging one roughing wheel and one finishing wheel on one arbor allows workpieces to be ground from the solid blank in one set-up.

Involutes are generated by applying the tangent (edge of the grinding wheel) across the reference circle. The spacing of individual points and “feed direction” are both freely selectable in this process.



Desired modifications to both profile and tooth trace can be conveniently defined by means of the dialog.





Cylindrical shafts placed in and removed from stacks by lifting loader. This automated solution provides a high level of autonomy for little space.

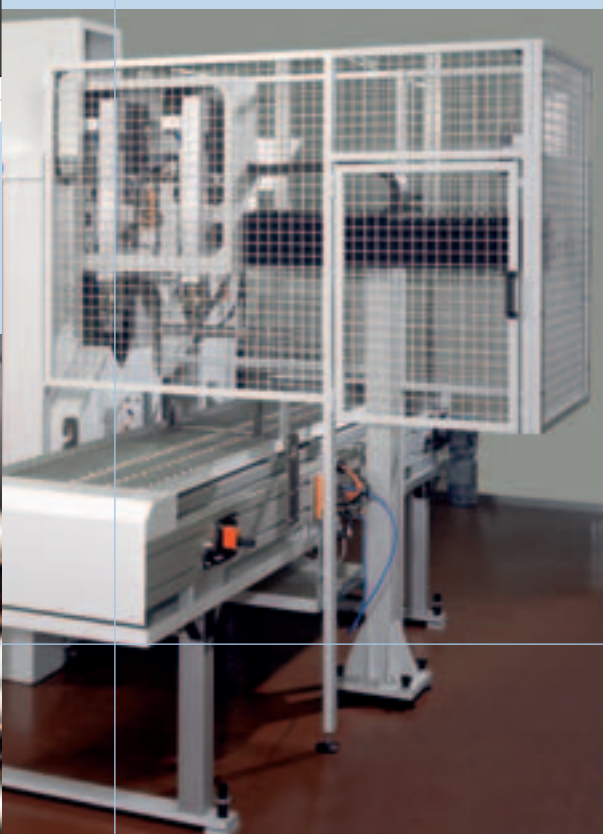


The combination of indexing chain belt and V-magazine for supplying blanks and the unloading belt for discharging finished parts provides another interesting option for rapidly changing over long shafts, pinions and gears.



Customer-specific material flow system with pallet circulating system. The workpiece pallets can be changed over in minimum time, with no tools required for the process.

Fast and flexible workpiece loading/unloading systems are available for the P 90 G. The machine can easily be incorporated into customer-specific conveyor systems. The gantry loader, which is integrated in the machine, can also be optimized in terms of length and function to suit unique workpiece loading requirements.



Machine with NC gantry loader, lifting capacity per gripper of 7 kg. Continuous indexing chain belt with central lifting station for supplying blanks and discharging finished parts.

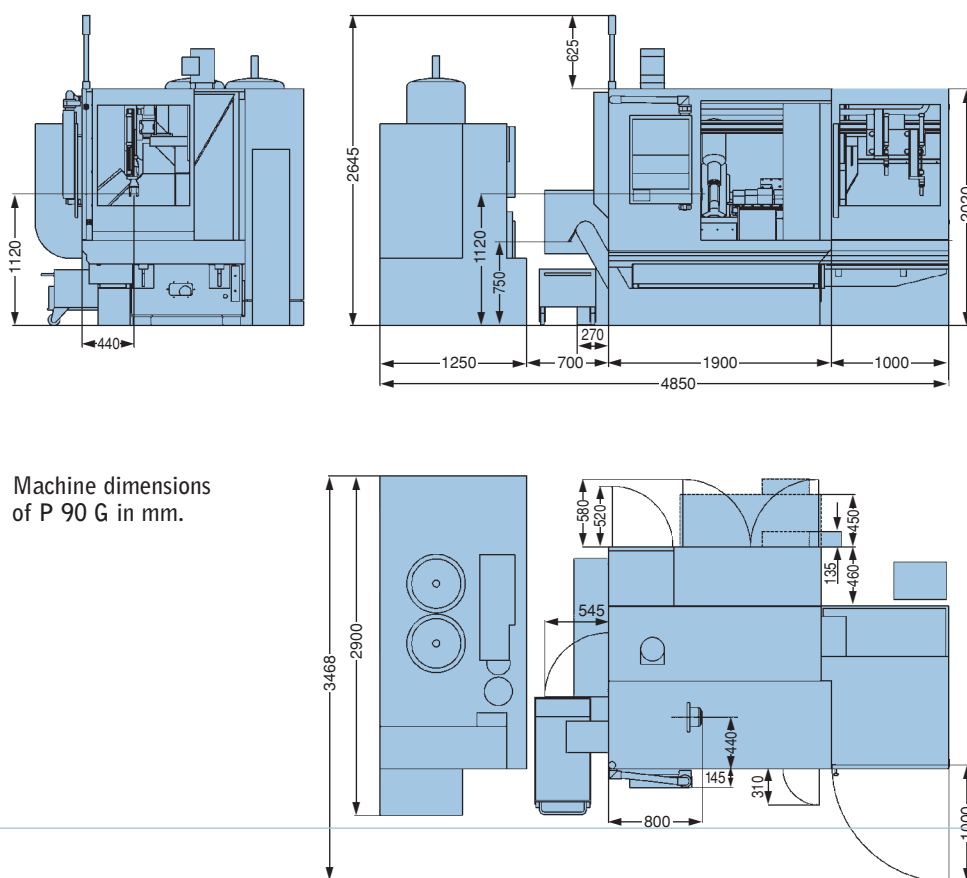
Technical data

Nominal workpiece diameter:	
– automatic loading	100 mm
– manual loading	125 mm
Nominal module of machine:	
– threaded wheel grinding	approx. 3.0 mm
– profile grinding	approx. 3.0 mm
– indexing generation grinding	approx. 3.0 mm
Maximum axial slide travel	300/400* mm
Maximum grinding head swivel angle:	
– left	45°
– right	115°
Maximum grinding wheel dimensions:	
– form wheel diameter	115 mm
– grinding worm diameter	100 mm
– grinding worm length	180 mm
Maximum grinding wheel travel (shifting)	160 mm
Maximum work spindle speed	3000 rpm
Minimum/maximum center distance	10/100 mm
Grinding wheel drive rating	14 kW
Grinding wheel speed range	50 – 12000/20000* rpm
Rapid traverse speeds:	
– axial	10000 mm/min
– radial	7500 mm/min
– tangential	5000 mm/min

Machine weight (without filtration unit)

approx. 5500 kg

* Special design.



Tooling and Workholding.

Gleason is the world's leading source for advanced new tooling and Quick Change workholding systems to meet the latest requirements for accuracy, speed, and tool life. Only Gleason provides the complete range of gear cutting and finishing tools for cylindrical and bevel gears, including hobs, shaper cutters, shaving and honing tooling, bevel blades and heads, replatable CBN and diamond grinding and dressing wheels and plated diamond rolls.

The Complete System.

At every stage of the gear production process, Gleason offers advanced new technology that takes significant production time and cost out of the operation.

For the production of spur and helical gears, for example, Gleason offers a full range of vertical and horizontal hobbing machines, gear shapers (electronic and mechanical helical guides), shaving and honing machines, and advanced threaded wheel and profile grinding machines.

Gleason's ability to manufacture and completely inspect all types of gears and gear cutting tools is unmatched.

Global Service and Support.

With a manufacturing presence worldwide, as well as service support in over 30 countries, Gleason is truly a global company.

Our broad-based infrastructure and strong worldwide presence place us in a unique position to respond to customer requirements anywhere, anytime.



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