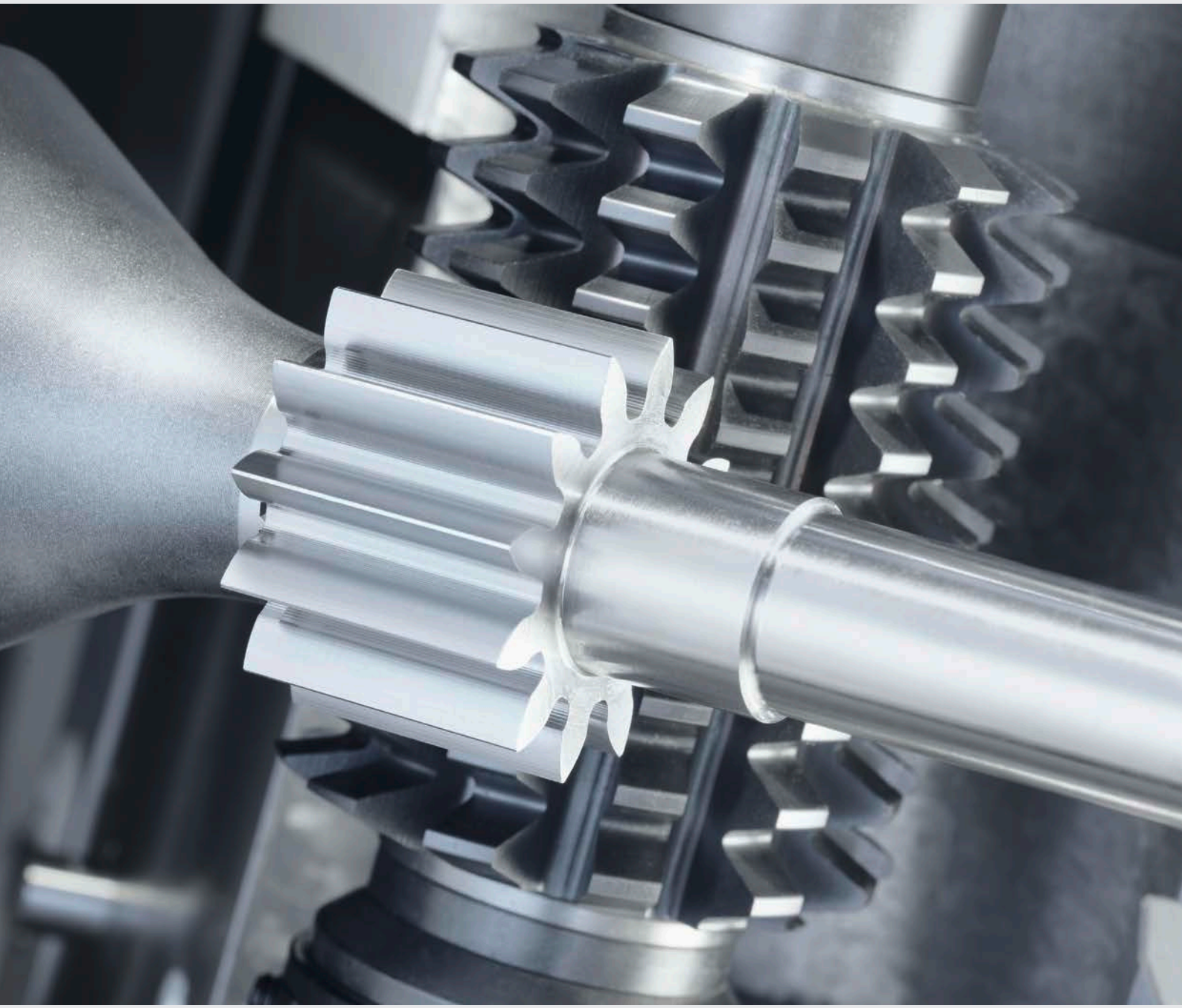
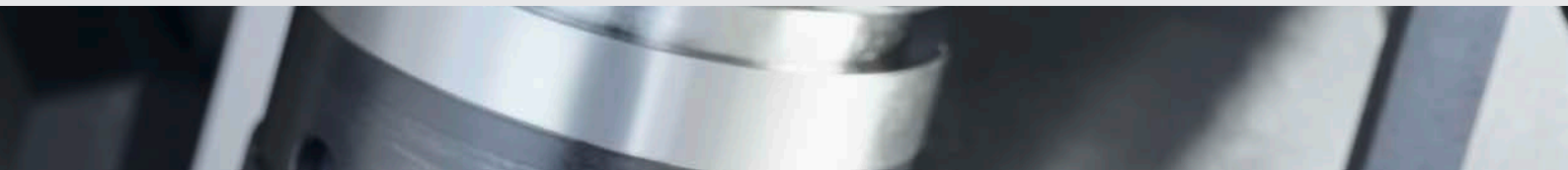
Total Gear Solutions Gleason



Horizontal Hobbing Machines



Overview
Horizontal Hobbing Machines

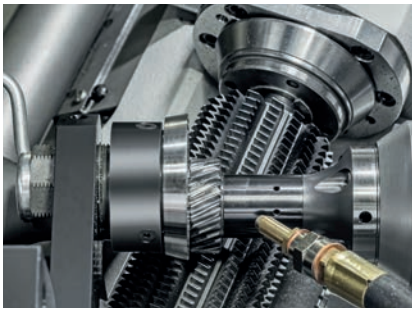
Universal Machines for a Wide Range of Applications

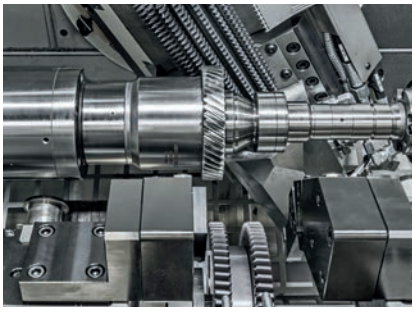
Horizontal hobbing machines from Gleason are designed to handle a wide variety of applications.

Whether automotive or special gears, gear wheels or shafts, worms and worm gears, our range of horizontal hobbing machines can handle them all – up to an outside workpiece diameter of 100 mm (up to 120 mm on request) and module 4 mm (worms: module 8 mm).

Various options and configurations allow optimum machining of specific applications including chamfering/ deburring.

- Different machine model versions for optimum adaption to various applications.
- Direct-driven hob and workpiece spindles with sufficient power reserves to exploit the potentials of modern tool generations.
- Horizontal axis design for „natural“ simple chip removal.
- Dry or wet machining with different chip removal options.
- Linear recirculating ball guides for maximum rigidity and precision.
- Absolute measuring systems on linear axes.
- Ergonomically designed work space allows fast machine setups and rapid tool changes.
- Siemens 840D sl control with Gleason dialog program and diagnosis software for maximum user-friendliness.
- Various gantry loader options for short loading and unloading times.
- Auxiliary units with easy access for convenient and fast servicing.
- Large selection of software options for different application requirements.





Whether pinions, gears, shafts or worms, Gleason horizontal hobbing machines are up to the job, including time-parallel or subsequent auxiliary tasks.

The Compact Solution for Gears, Shafts and Worms

The P60 is the smallest machine in Gleason´s range of horizontal hobbing machines.

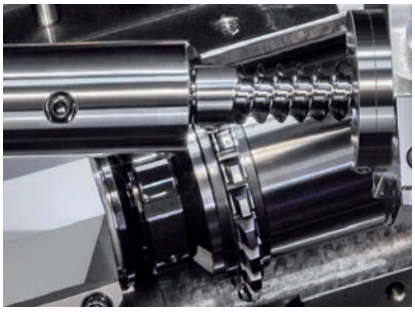
The P60 cuts geared workpieces with any profile which can be produced by the hobbing process, up to a diameter of 80 mm (120 mm on request) and module 2.5 mm. This machine is also the perfect solution for machining steering pinions and worms.

Highlights

- Versatile solution for gears, pinion shafts, worms and worm gears.
- Hobbing and milling.
- Hard finishing of gears and pinions via hard skive hobbing.
- Machine is simple to adapt to different automation requirements.
- Minimum floor space 5 m^2.
- Optional equipment for carbide skive hobbing.

Automation with gantry; discontinuous chain belt, loading rail and unloading belt.

Skive hobbing of a steering pinion with a carbide tool.



Worm-milling with milling cutter.

P90 – Shortest Cycle Times for Planetary Pinions and Sun Gears
P90EL – for Long Shafts

The P90 will enable you to handle any profile which can be hobbed, up to a diameter of 100 mm (120 mm on request) and module 3 mm (optionally 4 mm, larger modules depending on application).

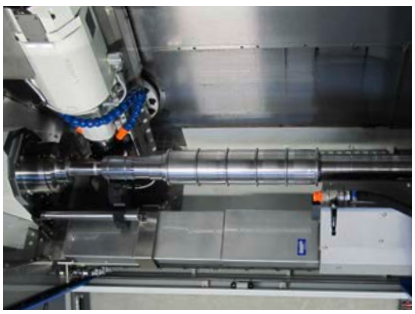
The P90 has been specifically optimized for the mass production of shafts, planetary pinions and sun gears with the shortest cycle times. The P90 can also machine any other disk- and shaft-type workpieces, including steering pinions and worms.

Highlights

- Direct-driven hob head with up to 12,000 rpm.
- Cutting planetary pinions in a few seconds.
- Extremely fast rotary loader.
- Hobbing and milling of gears and worms.
- Variety of automation systems for your individual requirements.
- Optional support of long shafts by integrated steady rests.
- Shafts up to 1,200 mm in length (P90EL).
- Optional equipment for carbide skive hobbing.

Hobbing and deburring as a dry-cut process.

Hobbing of pump gears.



The P90EL features an extended machine frame and increased axial slide travel (cutting length) to 800 mm for shafts up to 1,200 mm in length.

P90CD Hobbing Machine

Hobbing with Time-parallel Chamfering/Deburring for Gears and Small Shafts

Based on the P90 model, the machine is enhanced with an additional NC chamfering/deburring station which works completely time-parallel to the actual cutting process, hence productivity is not compromised by the auxiliary process.

The P90CD can handle any profile which can be hobbed, up to a diameter of 60 mm (120 mm on request) and module 3 mm – with short cycle times.

The P90CD is an excellent solution for the machining of disc-type workpieces, e.g. planetary pinions, and short shafts.

Highlights

- Direct-driven hob spindle with up to 12,000 rpm for minimum machining times.
- NC chamfering/deburring station works time-parallel to the hobbing process for optimum results requiring a few seconds only.
- Auto-meshing of cut workpieces and chamfering tools for consistent cycle times and to avoid damages on workpieces.
- Gleason rotary chamfering/deburring tools for accurate deburring and precise chamfers.

Dry hobbing and chamfering/deburring.

NC chamfering/deburring station.

Eliminating Burrs in High Volume, Geared Shaft Production

The P90iC features an integrated chamfering/deburring unit which eliminates burrs on the tooth flanks during geared shafts production.

This model version is an excellent solution for the production of shafts using a one- or two-cut process for finish hobbing or to create a quality-base for subsequent hard-finishing operations.

The two-cut process in particular is executed in a single setup (cutting - chamfering/deburring - cutting) and eliminates remaining burrs in the gear flanks. This process is very beneficial in subsequent hard-finishing processes, protecting the tool life of expensive finishing and dressing tools, especially if a honing process is applied.

The P90iC handles any geared profile which can be hobbed, up to a diameter of 100 mm (120 mm on request) and module 3 mm (optionally module 4 mm).

Highlights

- Direct-driven hob head options offer the right solution to different applications.
- Optimized solution for shaft-type workpieces.
- NC chamfering/deburring process for consistent, quality results.
- Burr-free flanks for a long tool life in subsequent hard finishing process.
- Gleason rotary chamfering/deburring tools for accurate deburring and precise chamfers in accordance with customer specifications.
- Cutting and chamfering with a minimum floor space of 6 m^2 (64.5 sqft.).

Hobbing and chamfering in one setup.

P90WM Worm Milling Machine

Designed for Worm Manufacture up to Module 8 mm

The P90WM Horizontal Worm Milling Machine is the ideal solution for the machining of any type of worm, up to a diameter of 100 mm and module 8 mm.

The special cutter head design features an extended swivel range, specifically developed for worm-milling applications. The spindle can mount disc-type milling cutters up to 200 mm in diameter made of HSS or with indexable carbide inserts.

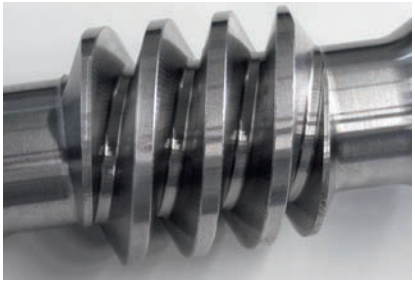
The P90WM cuts single-start as well as multiple-start worms, including the removal of sharp infeed and outfeed burrs without the need for an additional setup or the application of a special tool.

Highlights

- Optimized for the machining of worms.
- Special cutter head for the machining of worms.
- Disk-type milling cutters made of HSS or with indexable carbide inserts.
- Suitable for single-start or multiple-start worms.
- Removal of sharp in- and outfeed burrs with the worm cutter.
- Prismatic supports available for longer workpieces.

Prismatic supports are available for longer workpieces.

Worm manufacturing with regular HSS milling cutters.



Optional deburring and end relief for worm milling.

Hobbing and Chamfering/Deburring of Larger Shafts

The P210L Hobbing Machine and P210LiC Hobbing Machine with Integrated Chamfering/Deburring Unit are designed for the manufacture of large, long shafts which must meet high quality demands.

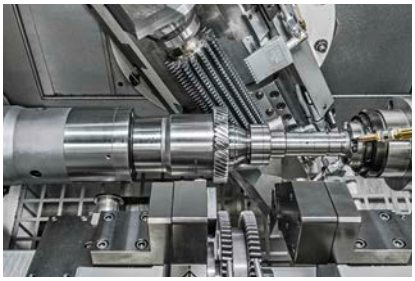
Both models cut any profile which can be hobbed, up to a diameter of 180 mm (larger diameters on request) and module 4 mm.

The LiC Version of the machine is equipped with an integrated chamfering/deburring unit which eliminates residual burrs in the gear flanks by the means of a two-cut-process (cut - chamfer - cut), all in one setup.

Quality, burr-free flanks significantly support tool life of finishing and dressing tools in the subsequent hard-finishing processes, especially if a honing process is applied.

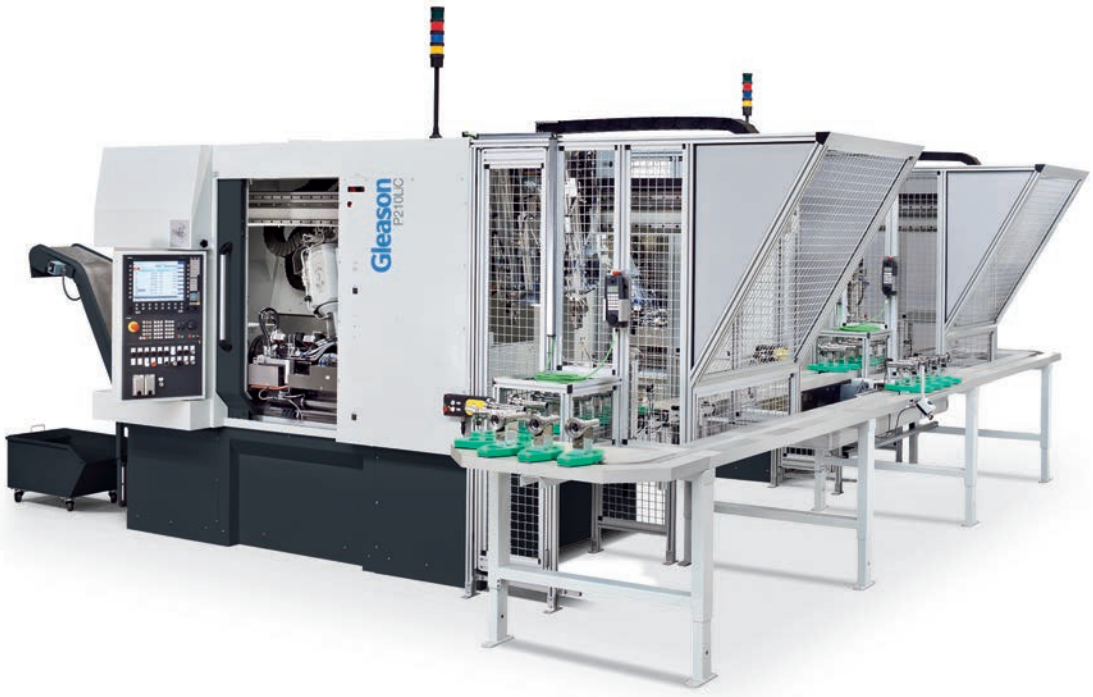
Highlights

- An axial travel of 400 mm permits cutting of shafts up to 600 mm long (depending on the workholding design).
- Integrated CNC chamfering/deburring unit with two-cut process option for burr-free flanks (P210LiC).
- Skive Hobbing equipment available.
- Gleason rotary chamfering/deburring tools for quality, accurate deburring and precise chamfers.



Hobbing and chamfering/deburring of an automotive input shaft.

Hobbing an output shaft.



Standard and Customized Automation Systems

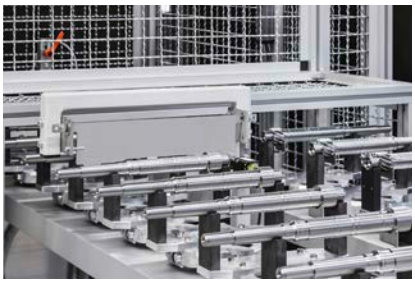
Gleason offers a wide array of fast and flexible automation systems including fully-integrated automation modules made by Gleason.
The integrated gantry loaders of the horizontal machine series can be adapted to any required functionality or specific auxiliary requirement.

Gleason horizontal machines are easily integrated into existing workflows with vertical or horizontal orientation.

Next to typical third party automation solutions we offer fully integrated, robot-, conveyor- or basket-based automation systems made by Gleason. The modular nature of machine and automation allows to integrate additional processing steps with stations that can be added up- or downstream of the actual gear cutting process.

- Chamfering/deburring, including the deburring of the in-/outfeed of worms.
- Pre-positioning of workpieces.
- Coolant spin-off.
- Brushing.
- Inspection by dimensions over balls or by dual-flank roll testing.
- Laser-marking or engraving.
- Many other functions available on request.

Basket-/Tray-based systems by Gleason Automation Systems.


Ring-conveyor with adjustable pallets.

Cell integration via robotic loading.


Direct loading/unloading to conveyor.

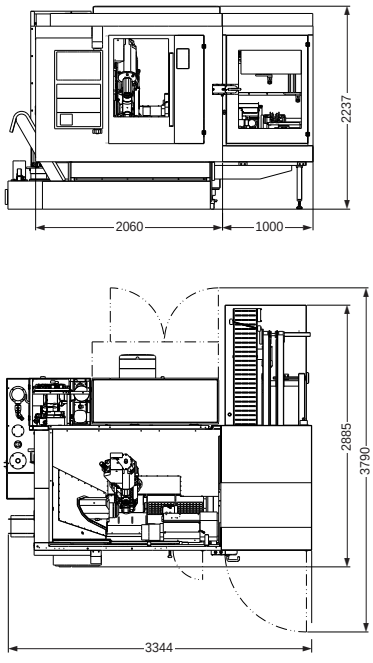

Gantry loader.

Technical Data / Dimensions

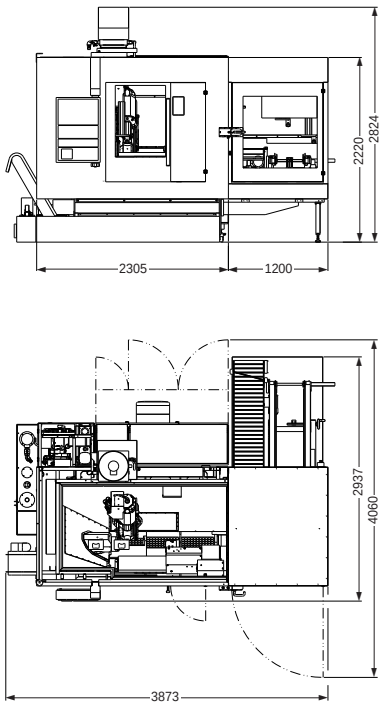
		P60	P90	P90EL	P90CD
Workpiece diameter, nominal	mm	80/120*	100/120*	100/120*	60/120*
Workpiece length, max.	mm	460	550	1,000/1,200**	200
Module, nominal					
- standard	mm	2.5	3	3	3
- option	mm	-	4	4	-
Axial slide travel, max.					
- standard	mm	320	400	800	400
- option	mm	400	-	-	-
Maximum workspindle speed	rpm	3,000	3,000	3,000	3,000
Hob diameter, max.					
- standard	mm	60	80	80	80
- option	mm	-	-	-	-
Hob length toothed, max.	mm	160	180	180	180
Worm milling cutter diameter, max.	mm	118	118	118	-
Hob shift travel, max.	mm	160	160	160	160
Hob head swivel range	degrees	+115/-45	+118/-45	+118/-45	+118/-45
Hob speed range					
- standard	rpm	200-5,000	50-12,000	50-12,000	50-12,000
- option	rpm	-	50-5,000	50-5,000	-
Hob spindle power					
- standard	kW	7.5	14	14	14
- option	kW	-	28	28	-
Maschinengewicht ca.	kg	4,800	5,500	6,000	6,000

* on request ** optional Specifications are subject to change without notice.
Please contact our application engineering department for requirements profiles outside the limit values specified here.

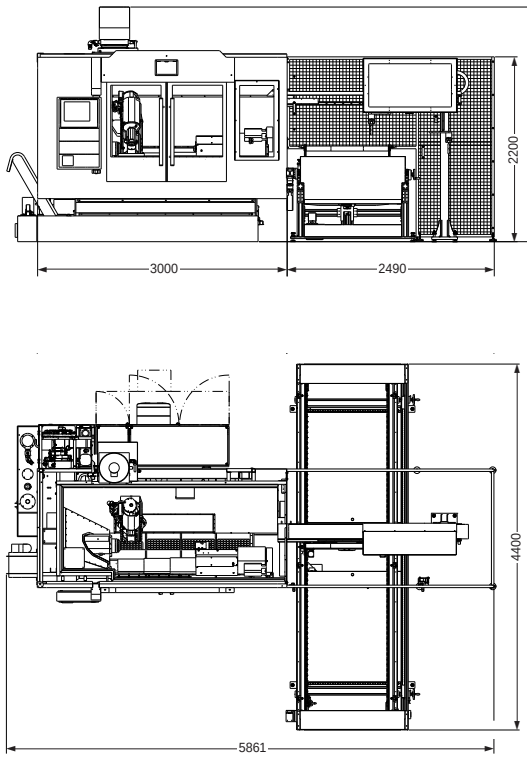
P60



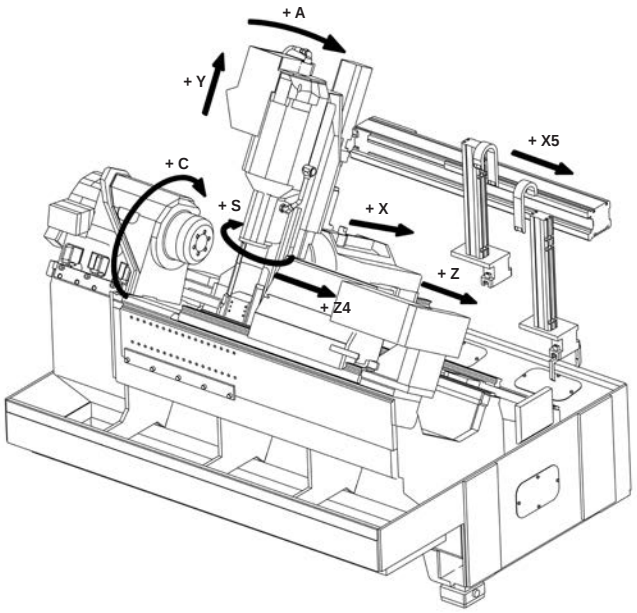
P90



P90EL



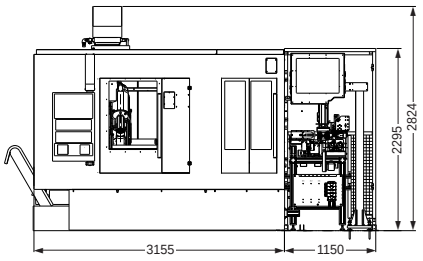
P90iC	P90WM	P210L	P210LiC
100/120*	90/100*	180/230*	180
550	500	490/640**	400/550**
3	8	4	4
4	-	-	-
400	280	300	300
-	330	400	400
3,000	3,000	1,000	1,000
80	-	65	65
-	-	80	80
180	-	170	170
-	200	-	-
160	-	160	160
+118/-45	+54/-60	+40/-40	+40/-40
50-12,000	50-500	300-4,000	300-4,000
50-5,000	-	-	-
14	22	14	14
35	-	-	-
5,700	5,500	8,000	8,500

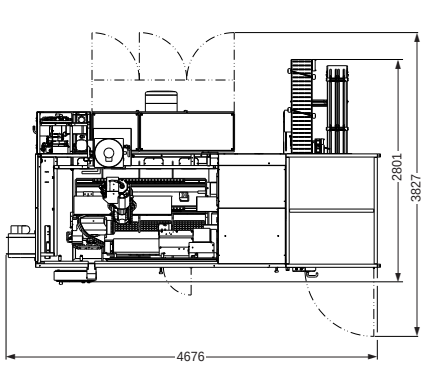


NC axes

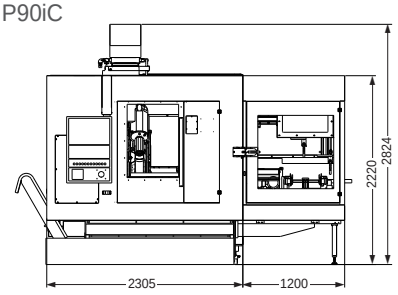
S = Hob spindle
C = Spindle head
A = Hob head swivel
X = Radial slide
Y = Tangential slide
Z = Axial slide
Z4 = Tailstock
X5 = Loader

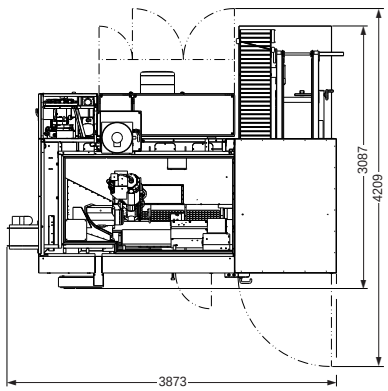
P90CD



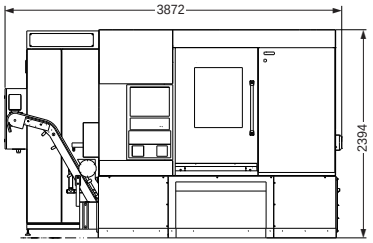


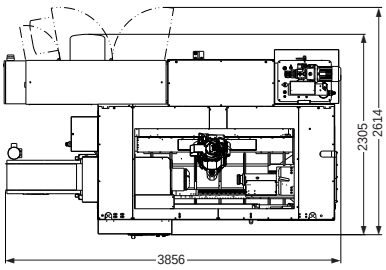
P90iC





P210L / P210LiC





Machine dimensions in mm

Complete Solutions from One Source

Gear-cutting Tools

Gleason solid steel hobs and milling cutters are available in the module range from 0.3 to 40 mm (DP 85 – 0.635), bore or shank-type, made of high-speed steel, G90, solid carbide or other substrates; coated with latest PVD coatings based on titanium, aluminum, chrome or nitride

Applications

- Involute gears
- Chain wheels
- Crown gears
- Serrations
- Worm gears
- Cycloidal gears
- Gear shafts
- Multi-start gears
- Knurled wheels
- Spline shafts
- Special gears

Deburring Tools

Rotary deburring is a combined forming and metal-cutting process for chamfering and deburring of gears. The method is suitable for large-scale and serial production and is characterized by extremely long tool life and thus a high degree of economy.

Applications

- Module range from 0.8 to 6 mm.
- Dry or wet machining.
- Long tool life and high efficiency.
- Chamfer shapes and sizes selectable.
- Integrated burnishing feature.
- Patented, adjustable burnishing wheel to adapt lead corrections

Workholding Equipment

Standard Workholding
Gleason designs and manufactures a complete line of workholding equipment for cylindrical gears. Designs are both mechanical and hydraulic including quickchange systems for both Gleason and non-Gleason spindles.

Quik-Flex®Plus
- Modular workholding system designed to be quickly installed, removed and adapted to different gear applications.
- Changeover is done with a simple removable handle in less than 30 seconds

Global Services

Gleason Global Services keep customers‘ machines running at optimum levels regarding productivity, quality and economy.

Gleason provides also mechanical retrofits and CNC upgrades to extend the lifetime of your investment.

Sharpening & Coating Services

Gleason local service centers provide sharpening, reconditioning and coating for hobs and chamfering/deburring tools, but also for all other gear cutting tools.

Gleason

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