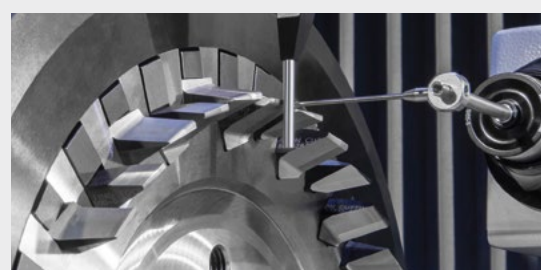
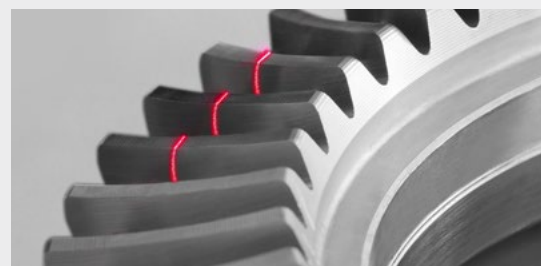


Total Gear Solutions **Gleason**



Bevel Gear Manufacturing Solutions





Bevel Gear Cutting Machines

| | Workpiece dia. max., mm | Face width, mm | Max. module, mm |
|-----------------|----------------------------|-------------------|--------------------|
| Phoenix® 280C▪ | 280** | 55 | 10 |
| Phoenix® 280CX▪ | 280** | 55 | 10 |
| Phoenix® 500C▪ | 500** | 110 | 15 |
| Phoenix® 600HC▪ | 600** | 110 | 15 |
| Phoenix® 1000HC | 1000 | 115 | 17 |

▪ with Coniflex® cutting capabilities
** maximum workpiece diameter is not valid for the Coniflex® option

Bevel Gear Grinding Machines

| | Workpiece dia. max., mm | Max. wheel dia., mm | Max. module, mm |
|----------------|----------------------------|------------------------|--------------------|
| Phoenix® 280G▪ | 280** | 228 | 10 |
| Phoenix® 600G▪ | 600** | 508 | 15 |
| Phoenix® 800G | 762 | 600 | 17 |

▪ with Coniflex® grinding capabilities
** maximum workpiece diameter is not valid for the Coniflex® option

Curvic® Coupling Grinding Machines

| | Workpiece dia. max., mm | Wheel dia. range, mm | Max. grinding wheel speed, rpm |
|-----|----------------------------|-------------------------|-----------------------------------|
| 887 | 914 | 164 to 546 | 3,000 |
| 888 | 610 | 115 to 530 | 3,000 |

Bevel Gear Testing Machines

| | Workpiece dia. max., mm | Shaft angle, degree | Offset range, mm |
|--------|----------------------------|------------------------|---------------------|
| 360T | 450 | 90 (65 -185)* | +/- 150 |
| 600HTT | 600 | 90 | +/- 76 |
| 1000T | 1,050 | 45 -180 | +/- 115 |
| 2000T | 2,000 | 30 -135 | +/- 210 |
| 2500T | 2,500 | 30 -135 | +/- 275 |

*option

For requirements beyond specified values, consult Gleason Application Engineering.

Bevel Gear Lapping Machines

| | Workpiece dia. max., mm | Shaft angle, degree | Offset range, mm |
|--------|----------------------------|------------------------|---------------------|
| 600HTL | 600 | 90 | 76.2 |

PMC Quenching Machines

| | Workpiece dia. max., mm | Total force, kN | Oil capacity, l |
|------|----------------------------|--------------------|--------------------|
| 685Q | 685 | 259 | 1,856 |

Blade Grinding and Cutter Sharpening Machines

| | Stick blades for cutter dia. | Grinding wheel drive, kW | Grinding wheel speed, rpm |
|-----|---------------------------------|-----------------------------|------------------------------|
| BPG | 38 - 457 mm 1.5" - 18" | 20 | 10,000 |

| | Maximum cutter dia. | Maximum tilt, degree | Index range |
|--------|------------------------|-------------------------|-------------|
| NCG125 | 1.1" - 12" | + 40 | 1 - 99 |
| NCG205 | 2" - 25" | + 40 | 1 - 99 |

Blade Inspection Machines

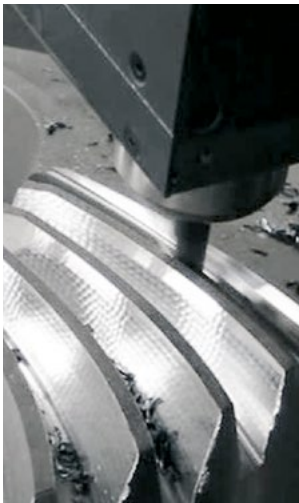
| | Application | Capacity |
|-----|---|-------------------------------|
| GBX | Touch probe - all blades | Stick blade width up to 35 mm |
| BIM | Optical, automatic loading - all blades | Stick blade width up to 35 mm |

Cutter Build Machines

| | Application | Capacity |
|-------|--|--|
| CCB | Coniflex® Plus | 4.25" - 9" - 15" outside diameter |
| | Revacycle® | 16" and 21" outside diameter |
| | Pentac® Slimline | Up to 15" outside diameter |
| | Curvic® Couplings Inspection | Up to 550 mm max. outside diameter, stacking height 305 mm |
| CB | All available stick blade cutter systems | Face Milling 1.5" - 21" (diameter) Face Hobbing 16.5 - 210 mm (radius) |
| 500CB | All available stick blade cutter systems | Face Milling 2.75" - 21" (diameter) Face Hobbing 16.5 - 210 mm (radius) |



5-Axis Machining Centers



Gleason-Heller 5-Axis Machining Centers for Large Cylindrical and Bevel Gears

| | Workpiece dia. max., mm | Pinion shaft length max., mm | Table / pallet size, mm |
|--|----------------------------|---------------------------------|----------------------------|
| FP Series 5-Axis Machining Centers with Pallet Changer | | | |
| FP6000 | 1,000 | - | 630 x 630 |
| FP8000 | 1,250 | - | 800 x 800 |
| FP10000 | 1,400 | 1,350 | 1,000 x 1,000 |
| FP14000 | 1,400 | 1,550 | 1,000 x 1,000 |
| FP16000 | 2,000 | - | 1,250 x 1,600 |
| FT Series 5-Axis Machining Centers with Table Loading | | | |
| FT6000 | 1,580 | 1,200 | Ø 1,000 |
| FT8000 | 1,810 | 1,500 | Ø 1,200 |
| FT16000 | 2,500 | 2,000 | Ø 1,300 |
| CP Series 5-Axis Machining Centers with High-Speed Table for Turning with Pallet Changer | | | |
| CP6000 | 1,000 | - | 630 x 630 |
| CP8000 | 1,250 | - | 800 x 800 |
| CP10000 | 1,400 | 1,350 | 1,000 x 1,000 |
| CT Series 5-Axis Machining Centers with High-Speed Table for Turning with Table Loading | | | |
| CT6000 | 1,580 | 1,200 | Ø 1,000 |
| CT8000 | 1,810 | 1,500 | Ø 1,200 |



Automation Solutions

AR Series - Adaptable and Flexible Robotic Material Handling

| | Payload, max., kg | Weight of parts handled, max., kg |
|--------|----------------------|--------------------------------------|
| 70AR | 7 | 4.9 |
| 120AR | 12 | 8.4 |
| 250AR | 25 | 18 |
| 700AR | 70 | 49 |
| 2700AR | 270 | 150 |



ARC Series - Highly Versatile Cart Loaded Automation with Greater Capacity

| | Tray/basket size, max., mm | Payload, max., kg | Weight of parts handled, max., kg |
|--------|-------------------------------|----------------------|--------------------------------------|
| 70ARC | 500 x 700 | 7 | 4.9 |
| 120ARC | 500 x 700 | 12 | 8.4 |
| 250ARC | 500 x 700 | 25 | 18 |



ARD Series - Compact, Fast and Efficient Drawer Loaded Automation

| | Drawer size, max., mm | Payload, max., kg | Weight of parts handled, max., kg |
|--------|--------------------------|----------------------|--------------------------------------|
| 70ARD | 600 x 600 | 7 | 4.9 |
| 120ARD | 600 x 600 | 12 | 8.4 |

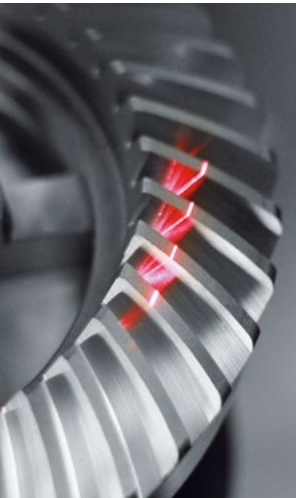
ARP Series - Pallet Loading and Unloading Automation

| | Tray size, max., mm | Payload, max., kg | Weight of parts handled, max., kg | Weight of trays handled, max., kg |
|--------|------------------------|----------------------|--------------------------------------|--------------------------------------|
| 70ARP | 500 x 700 | 7 | 4.9 | 49 |
| 120ARP | 500 x 700 | 12 | 8.4 | 49 |



Available options on all models include integration of pre- and post-processes including finishing, assembly, cleaning, inspection and marking.

Larger part handling systems are available on request.
Customized solutions available on request.



Analytical Gear Inspection Systems

| | Workpiece dia. max., mm | Module range, mm | Center distance, mm | Z-axis travel, mm |
|----------------|----------------------------|---------------------|------------------------|----------------------|
| 175GMS® | 175 | 0.2* / 0.4 - 6.35 | 380 | 305 |
| 300GMS® nano | 300 | 0.2* / 0.4 - 18 | 500* | 450* |
| 300GMSP® nano* | 300 | 0.2* / 0.4 - 18 | 500* | 450* |
| 350GMS® | 350 | 0.3 - 18 | 650* | 450* |
| 475GMS® | 475 | 0.4 - 18 | 650* | 450* |
| 475GMSP®* | 475 | 0.4 - 18 | 650* | 450* |
| 650GMS® | 650 | 0.5 - 22 | 1,000* | 600* |
| 850GMS® | 850 | 0.5 - 22 | 1,300* | 1,000* |
| 1000GMS® | 1,000 | 0.5 - 22 | 1,300* | 1,000* |
| 1300GMS® | 1,300 | 0.5 - 22 | 1,300* | 1,300* |
| 1500GMS® | 1,500 | 0.5 - 32 | 1,300* | 1,000* |
| 2000GMS® | 2,000 | 0.8 - 32 | 2,000* | 1,200* |
| 3000GMS® | 3,000 | 0.8 - 32 | 2,000* | 1,200* |

▪ P-version for the production environment * option
* other dimensions on request

Analytical Gear Inspection Systems with Laser Technology

| | Workpiece dia. max., mm | Module range, mm | Center distance*, mm | Z-axis travel*, mm |
|---------|----------------------------|---------------------|-------------------------|-----------------------|
| 300GMSL | 300 | 0.2* / 0.4 - 18 | 500 | 450 |
| 500GMSL | 500 | 0.2* / 0.4 - 12 | 1,000 | 600 |

* other dimensions on request * option
For laser measurement capability on larger size machines consult factory.



Closed Loop

Gleason’s Closed Loop functionality has been available in bevel gear production for many years and was adapted for cylindrical gears in 2015. Closed Loop provides for direct data exchange of measured data between metrology and production machines and is part of the standard repertoire of Gleason’s gear metrology systems.



Pentac® Plus Cutter System
For face hobbing and face milling on the latest CNC machines at optimum speeds and feeds.



Cyclocut™ Cutter System
Combines the advantages of the classic jobbing method (using interlocking 2-part cutters) with an exceptionally stiff cutter head design and Pentac® Plus design features.



Pentac® Plus RT (Radially Trueable) Cutter System
The ideal solution for today’s medium to high volume face hobbing and face milling applications.



Coniflex® Plus Cutter System
The most productive solution ever for straight bevel gear cutting.



Pentac® Ecoblade RT
For significantly reduced blade blank sizes with specially developed and patented radial spacers for highest productivity and economics.



UNIMILL™ Universal Milling Process
Gleason’s proprietary UNIMILL™ process enables users of Gleason Phoenix® cutting machines to manufacture bevel gears using universal cutting tools.



Pentac® Aero Cutter System
Improves aircraft bevel gears manufacturing efficiency and economy.



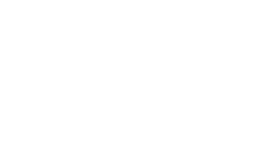
- Conventional Cutters**
- Coniflex® Cutter System
 - Revacycle® Flo-Cut™ Cutter System
 - Hardac® III Face Milling Cutter System
 - Solid Face Milling Cutter System
 - Crown Cut™ Face Milling Cutter System
 - RIDG-AC® Roughing Face Milling Cutter System
 - Helixform® Finishing Face Milling Cutter System



Pentac® Slimline Cutter System
A low profile peripheral cutter using stick blades; greatly reduces the large wall thicknesses typically required to accommodate individual clamp blocks and clamp screws for each stick blade.



Grinding Wheels and Dressing Tools
For the hard finishing of bevel gears, featuring advanced designs to deliver faster, more aggressive metal removal rates.



TRI-AC® Face Hobbing Cutter System
A rectangular stick blade-type face hobbing cutter system used for completing operations.



RSR® Face Milling Cutter System
A rectangular stick blade-type face milling cutter system with a front rake angle used for roughing or completing operations.

Spiroform™ Cutter System
Utilizes Pentac® Plus features to precisely duplicate the flank geometry cut with the older Spiroflex cutter system requiring 3 blades per blade group.

Tool Services
Gleason offers the most comprehensive range of reconditioning services for all kinds of bevel blades and cutters. Scan the e-Ticket code for online tooling requests.

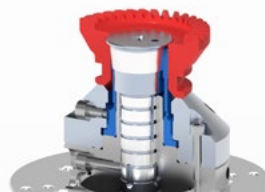




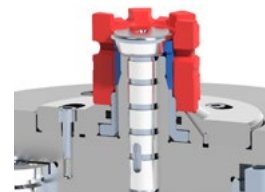
Single Angle Contracting Collets
Contracting collet system designed to center and clamp on one pinion or gear shank bearing diameter.



Vers-Grip® Arbor
Contracting collet system designed to simultaneously center and clamp two pinion or gear shank bearing diameters.



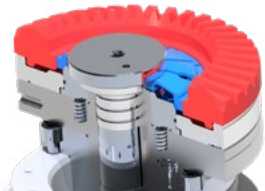
Single Angle Expanding Collets
Expanding collet system designed to center and clamp on one pinion or gear bore bearing diameter.



Double Angle Expanding Collets
Expanding collet system designed to center and clamp on one pinion or gear bore bearing diameter.



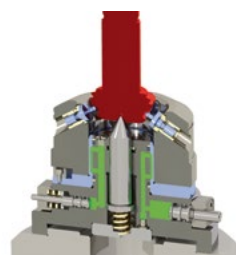
Segmented Collets
Standard collet configurations cover bores ranging from 20 mm (0.781") up to 100 mm (3.937").



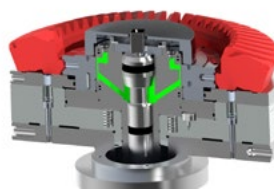
Uni-Spand® Arbor Small- to Mid-Sized Gears
Expanding spring clamping system used for small- to mid-sized bevel gear applications. Pull back feature to ensure positive seating, auto load compatible and part loading expansion spring safety built into the design.



X-Pandisk® Large Gear Clamping
Expanding spring clamping system used for medium to large bevel and cylindrical gear applications. Features like Uni-Spand Arbors.



Pitch Line Fixtures
Designed to locate a gear or pinion on its gear tooth pitch diameter, to re-qualify axial and radial bearing surfaces. (Typically used to re-qualify blanks after heat treatment).



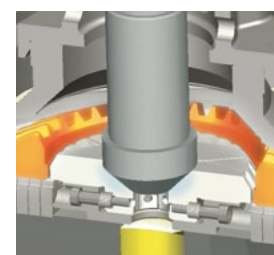
Hydraulic Workholding
Hydraulically actuated expanding and contracting workholding systems are used as an alternative to traditional mechanical clamping devices.



Flex-Spand™ for Gears
The universal clamping system utilizes replaceable segments to center and clamp in the gear bore bearing diameters, ranging from 108 mm (4.25") up to 203 mm (8.00"). The system is designed for gear development or low production applications.



Flex-Grip® for Pinions
The universal contracting collet clamping system utilizes replaceable components to center and clamp on pinion shank bearing diameters ranging from 35 mm (1.30") up to 55 mm (2.16"). This system is designed for prototyping and small lots manufacture.



Quench Fixtures
Designed to locate and contain a heated gear or pinion during a rapid cooling process, utilizing temperature controlled oil to control blank distortion.

KISSsoft Design Software for Gears and Transmission Elements

KISSsoft® performs strength calculations quickly and accurately, and provides detailed documentation, including safety factors and service life values. KISSsoft is completed by interfaces to all standard CAD programs and links to FE calculations.

KISSsoft AG develops design software for engineers and designers in a wide variety of fields: whether they

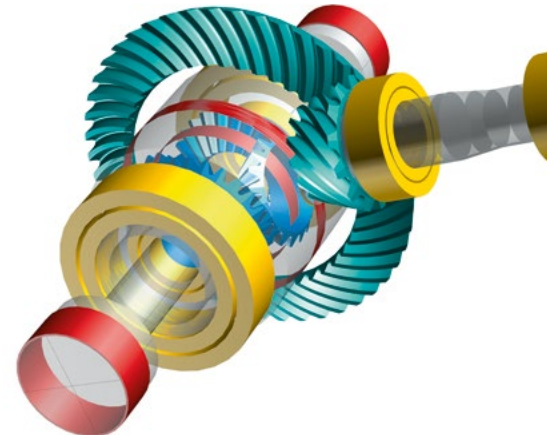
manufacture cable car systems, gears for construction equipment, Formula 1 race car transmissions or the tiny gears used in Mars rovers. When used in keeping with valid standards (DIN, ISO, AGMA), KISSsoft serves as a quick, high-quality tool for sizing transmission elements, reviewing calculations, determining component strength, and documenting safety factors and service life values.



KISSsys Transmission Design and Simulation

KISSsys® enables users to model complete gear units and drive trains. KISSsys brings together kinematic analysis, 3D graphics, and user-defined tables and dialogs, allowing users to perform system level evaluations in one run while

considering the interdependent effects of every single component of the gearbox. System reliability, load spectrum calculation, efficiency and thermal balance evaluation, modal analysis are now available, and more.

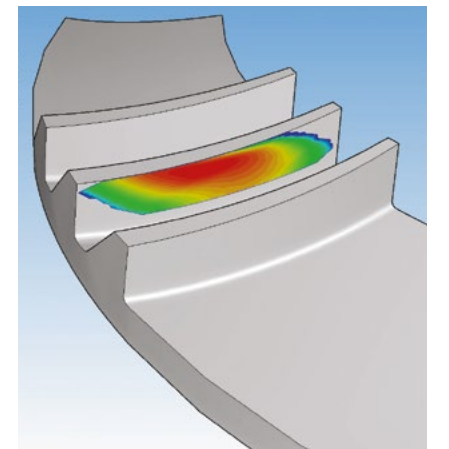


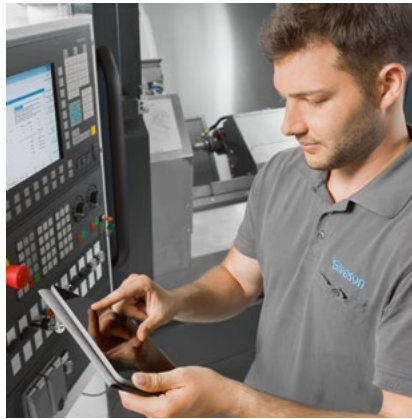
Seamless Connectivity to GEMS Engineering and Manufacturing System

KISSsys® and GEMS® are linked by a direct interface to exchange gear tooth and system design data. After the design of transmissions with KISSsys, bevel and hypoid gears are calculated and manufactured with GEMS. While designs are simulated more accurately than ever, they can also be optimized in a closed loop system.

GEMS includes many powerful software tools including:

- G-AGE® Gleason Automated Gear Evaluation.
- Summary Manager (Cutting, Grinding, Mechanical Conversions, BPG).
- UMC™ (Ultimate Motion Concept FEA (Finite Element Analysis).
- GABE™ Gleason Automated Blade Evaluation.
- Calculation of straight and Curvic® Couplings





Service Programs

Our objective is to keep your machine in optimum performance, avoiding unplanned downtimes before they occur. Gleason Service Teams know Gleason machines best and are able to provide comprehensive and certified services.

Original Spare Parts Perform Better

Only original spare parts guarantee the optimum performance and longevity of your Gleason machine as they are tested for quality and high reliability. We provide more than 100,000 different spare parts from our spare parts stock supplies located all around the globe.

Gleason Academy Training

The Gleason Academy offers the industry's widest variety of training classes, covering the full spectrum of bevel, cylindrical, automation, metrology as well as gear and transmission design topics. Additionally, we offer seminars, webinars and online trainings. For details about training classes, check gleason.com/training

Modernization Programs

Gleason Services offers modular packages for machine modernization. Depending on your requirements, you can choose from a wide range of solutions at different levels: Remanufacturing of mechanical components, update of automation systems, control upgrades, or a complete machine remanufacture.

e-Ticket Machine Services

Use the e-Ticket Machine Services for online service requests regarding Gleason machines. You benefit from immediate and effective support, as all relevant data is available.

Original Accessories

Original accessories include Geometry Check Set, Mobile Setup Station, Gleason Connect® digital retrofit, and Gleason Connect+ augmented reality support to extended remote communication possibilities.

Gleason Fingerprint

Fingerprint automatically compares machines' status in time for continuous diagnostics, resulting in proactive service actions.

Production Support

We help design and evaluate all types of bevel and cylindrical gears to enhance their manufacturability and functionality.

Gleason's Specialized Gear Services group supports the development of prototypes which are evaluated for performance and further manufacturing process improvements. We assist with pre-production and small lot production runs.

gTools Software

gTools software enables seamless communication between tooling, machines and reconditioning facilities, adding intelligence to customers' tooling management. gTools reduces setup time while minimizing operator errors. It provides data and methods to track and optimize the complete tool life cycle, during use, crib storage and reconditioning.



Gleason Plastic Gears – Where Precision Gears Take Shape

Custom molded gear solutions leverage KISSsoft® Gear Design Software that delivers the smoothest and quietest gear mesh possible.

Designs for Specific Applications

Custom gear tooth forms are tailored to specific applications including high temperature, high torque, low noise, and minimal backlash.

Material Selection

Gear design services include material selection and moldability recommendations.

Metal to Plastic Gear Design Transformation

Many applications can be rendered more efficient and simple by switching from metal to plastic gears. We help you with the transformation.

High Quality Gears

- State-of-the-art gear inspection capabilities ensure the highest gear quality levels possible.
- Gear Inspection with Tactile Probing and Laser Scanning.
- Double Flank Testing.
- Double flank testing capabilities include roll testing, testing with staging fixtures and product audits.
- Optical Metrology
Precise optical measurements complement contact measurements.
- Plastic Gears
Do Have a Quality Level
We can design and produce your plastic gears according to common gear quality standards.

Molding Solutions

Gleason Plastic Gears provides single and multi-cavity mold solutions including our proprietary no-weldline technology for stronger and more durable gears.

Stronger and More Durable Gears

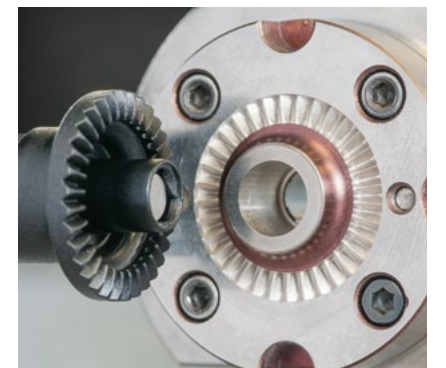
Gleason Plastic Gears proprietary no weld-line technology results in stronger and more durable gears, for applications that demand the best that plastic gears can offer.

Single Gears or Complete Gearbox Assemblies

We provide a single plastic gear or a complete gearbox assembly – as prototype suggestion or in serial production.

Solutions for Demanding Applications

Gleason Plastic Gears Solutions can be found in many different industries and applications including gears for e-drives and automotive actuators, gears for power tools, drones, robots and electronics, as well as geared medical applications.



Complete Solutions from One Source



Gleason

info@gleason.com
www.gleason.com



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