

Bevel Gear Manufacturing Solutions



Bevel Gear Manufacturing



Bevel Gear Cutting Machines

	Workpiece dia. max., mm	Face width, mm	Max. module, mm
Phoenix® 100C*	100*	30	3.5
Phoenix® 280C*	280*	55	10
Phoenix® 280CX*	280*	55	10
Phoenix® 500C*	500*	110	15
Phoenix® 600HC*	600*	110	15
Phoenix® 1000HC	1,000	115	17

* with Coniflex® cutting capabilities

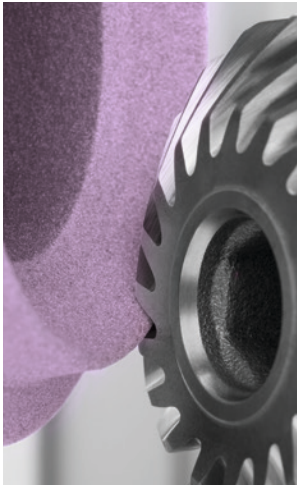
* maximum workpiece diameter is not valid for the Coniflex® option

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 - 546	3,000
888	610	115 - 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

/ 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

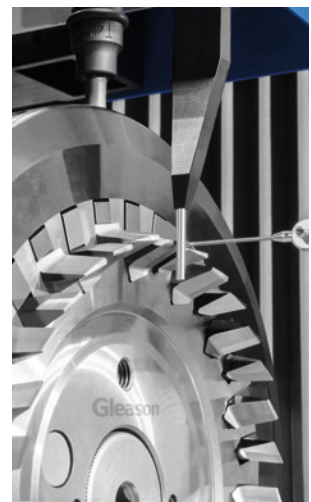
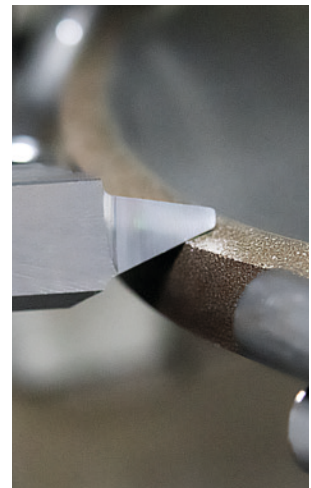
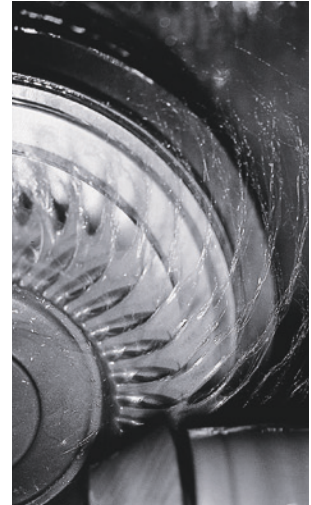
	Maximum cutter dia.	Maximum tilt, degree	Index range
125NCG	1.1" - 12"	+40	1 - 99
205NCG	2" - 25"	+ 0	1 - 99

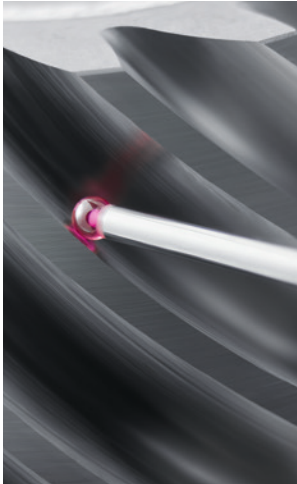
Blade Inspection Machines

	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
	Revacyle®	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)

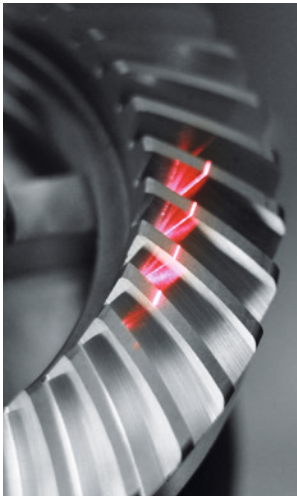




Analytical Gear Inspection Systems

	Workpiece dia. max., mm	Module range, mm	Center distance, mm	Z-axis travel, mm
175GMS nano	175	0.15 / 0.4 - 6.35	480	340
300GMS nano	300	0.15 / 0.4 - 18	500*	450*
300GMSP nano*	300	0.15 / 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*

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



Analytical Gear Inspection Systems (Laser)

	Workpiece dia. max., mm	Module range, mm	Center distance, mm	Z-axis travel, mm
300GMSL	300	0.15 / 0.4 - 18	500*	450*
500GMSL	500	0.15 / 0.4 - 18	1,000*	600*

/ option * other dimensions on request

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.

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

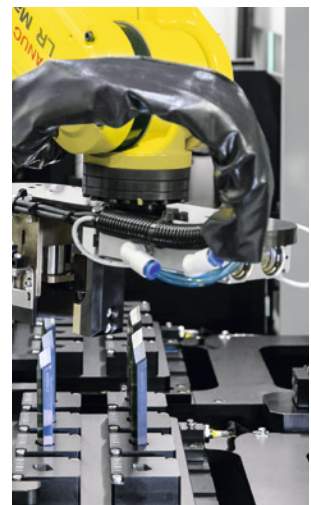
	Drawer size, max., mm	Payload, max., kg	Weight of parts handled, max., kg
70ARD	600 x 600	7	4.9
120ARD	600 x 600	12	8.4

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.



Gear Manufacturing Tools



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

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



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.

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

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

Conventional Cutters

- Coniflex® Cutter System
- Revacyle® 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

Grinding Wheels and Dressing Tools

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

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.



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

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

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.

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.



Workholding Solutions



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.



Uni-Spand® Arbor

Expanding spring clamping system used for small- to mid-sized bevel gears. Pull back feature to ensure positive seating, auto load compatible and part loading expansion spring safety built into the design.



Hi-Spand®

Hi-Spand is an expanding high torque collet with pull-back for positive seating, designed for gears and pinions with small bores. Bore range for clamping is from 0.560 inch (14.2 mm) to 1.5 inch (38 mm).



X-Pandisk®

Expanding spring clamping system used for medium to large bevel gear applications. Features like Uni-Spand Arbor.



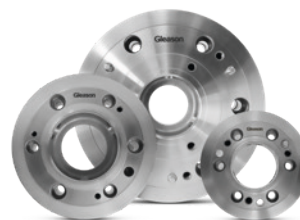
Mechanical and Hydraulic Workholding Systems

Mechanical and hydraulic workholding systems to meet any quality, production, and workpiece-specific requirement.



Single Angle Contracting Collets

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



Quick-Change Systems

Quick-change systems are available for any work spindle. The simple changeover takes place in 30 seconds or less, ensuring high repeatability.



Pitch Line Fixture

They are used in finishing operations such as hard turning, grinding and inspection. This is a great way to improve final accuracy between the gear pitch line and other critical datums.



Maintenance Programs

Gleason's regular maintenance programs for workholding equipment ensure full availability and consistent quality results in production.

Gear Development and Closed Loop Manufacture

The Next Generation in Bevel Gear Design and Optimization

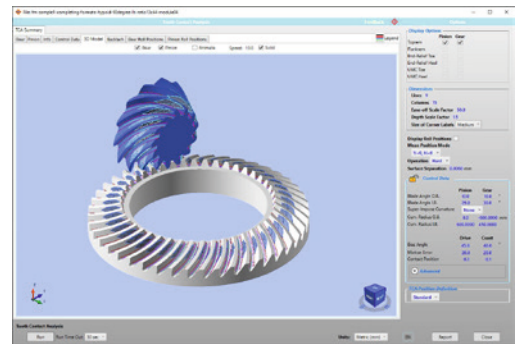
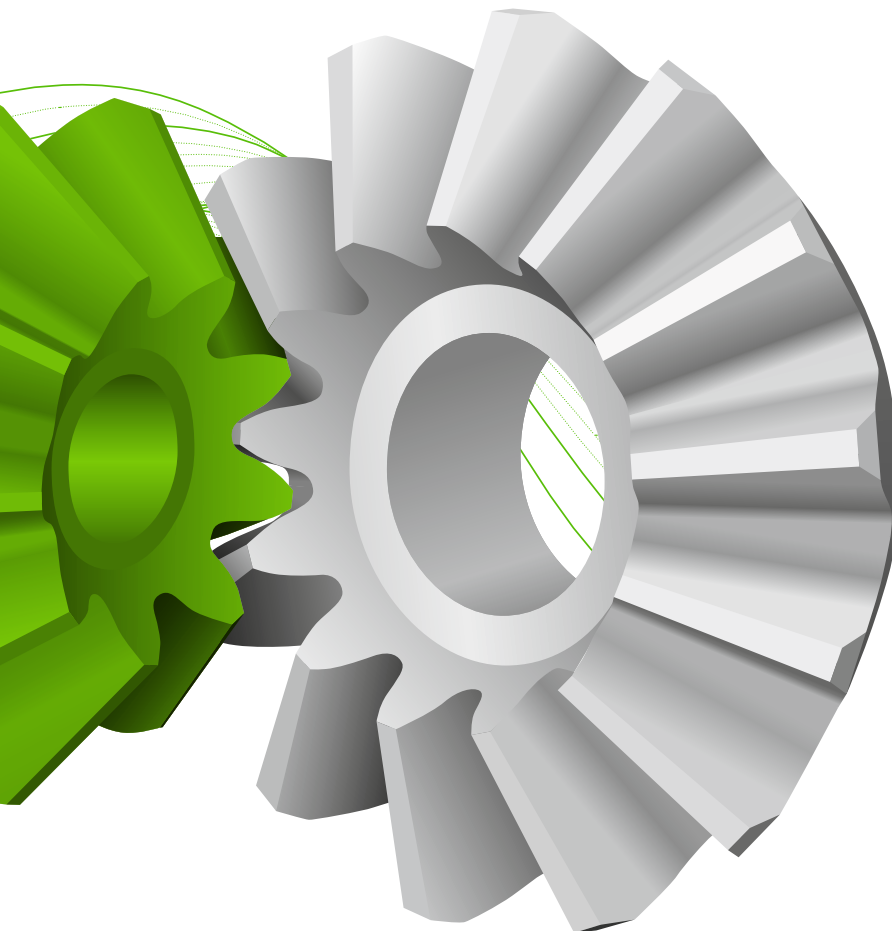
The GEMS® Gleason Engineering and Manufacturing System makes the design of spiral bevel gears and hypoid gear sets simple and fast. This powerful platform provides smart gear design and analysis capabilities for optimal performance of bevel gear-sets. The latest addition to GEMS, Gleason's Coniflex® Pro Design and Manufacturing System, is ideally suited for producing stronger, quieter, and more reliable e-drive differential gears in high volumes, for automotive, truck, bus and off-highway transmissions.

Seamless Connectivity

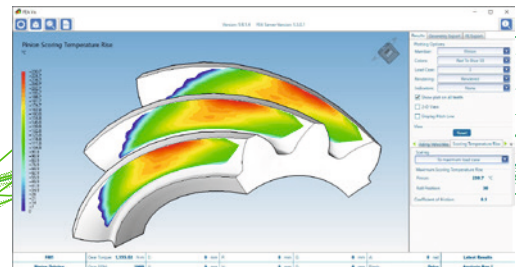
GEMS and KISSsoft® are linked by a direct interface to exchange gear tooth and system design data. After designing a transmission with KISSsoft, bevel and hypoid gears are calculated and manufactured with GEMS. While designs are simulated more accurately than ever, they can also be optimized in a closed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

GEMS provides many powerful software tools, including:

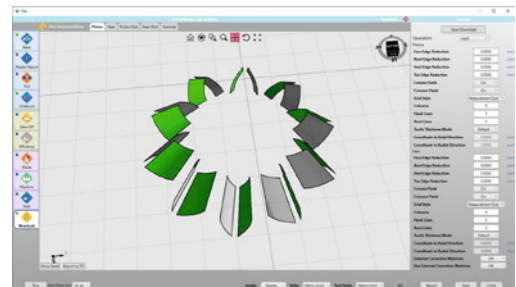
- G-AGE® Gleason Automated Gear Evaluation.
- Summary Manager for cutting, grinding, mechanical conversions, blade profile grinding.
- UMC™ Ultimate Motion Concept FEA Finite Element Analysis.
- GABE™ Gleason Automated Blade Evaluation.
- Calculation of straight and Curvic® Couplings.



Three-dimensional TCA in GEMS.



Dedicated FEA calculation in GEMS.



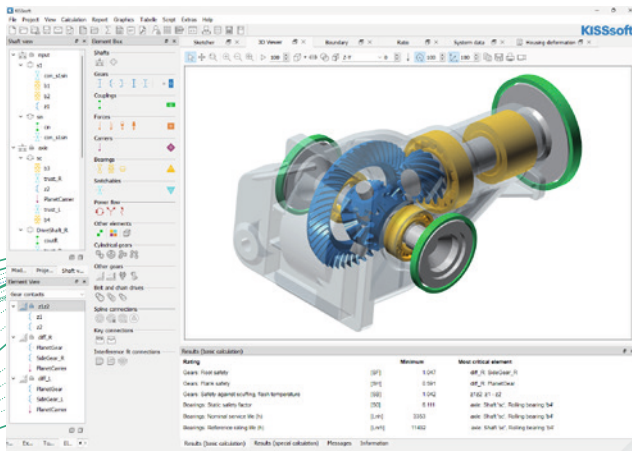
GEMS Coniflex Pro for straight bevel gears.

Gear Development and Closed Loop Manufacture

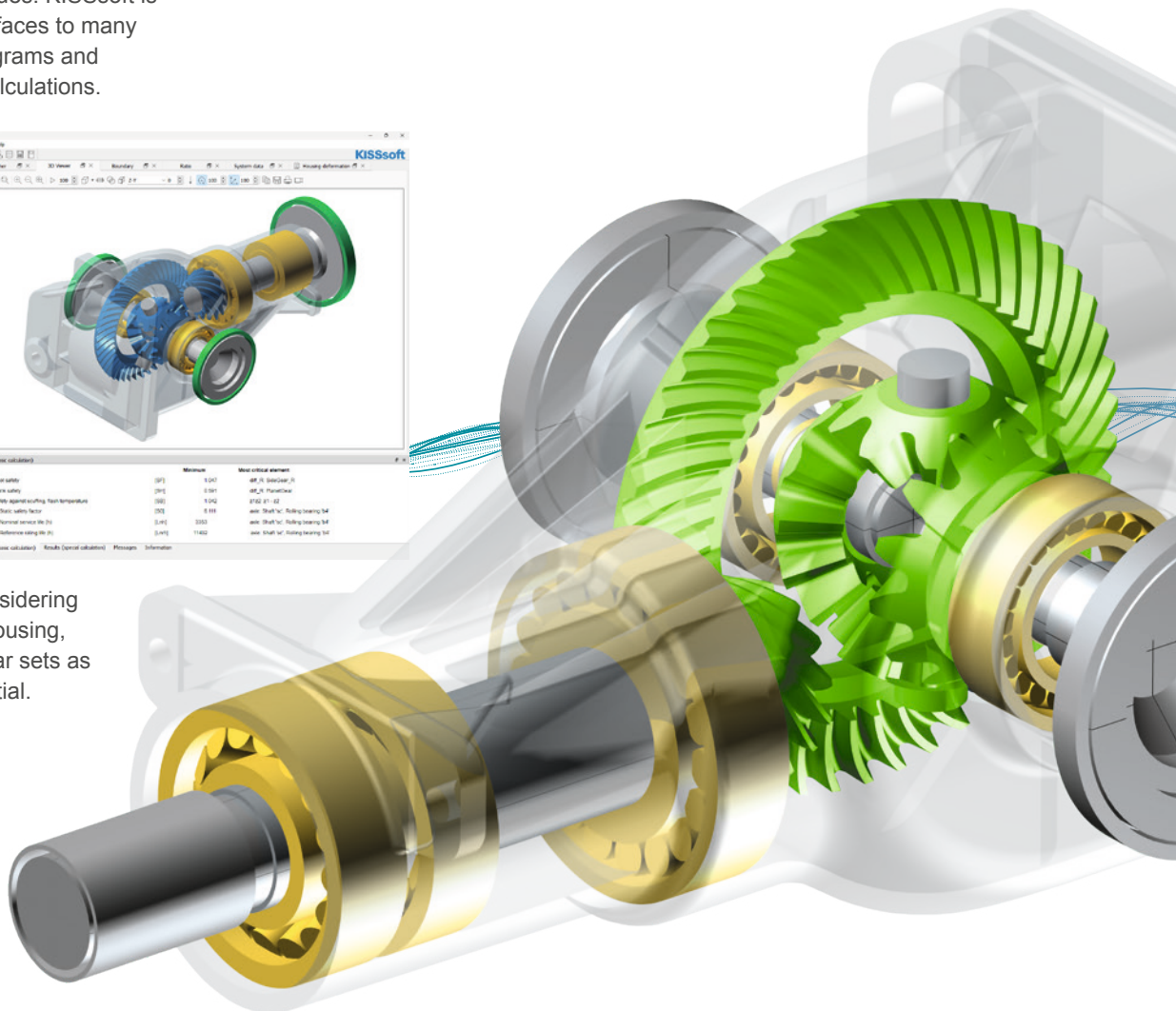
KISSsoft Design Software for Gears and Transmissions

KISSsoft AG is a fully owned subsidiary of Gleason Corporation. KISSsoft AG develops design software for engineers in a wide variety of fields: industrial gearboxes and geared motors, construction equipment, race car transmissions or aerospace applications. KISSsoft Design and Transmission Software includes rating methods along accepted standards (DIN, ISO, AGMA and others) and serves as a fast, high-quality tool for sizing transmission elements, optimizing gear geometry, determining component reliability, and documenting safety factors and service life values. KISSsoft is completed by interfaces to many standard CAD programs and integrates to FE calculations.

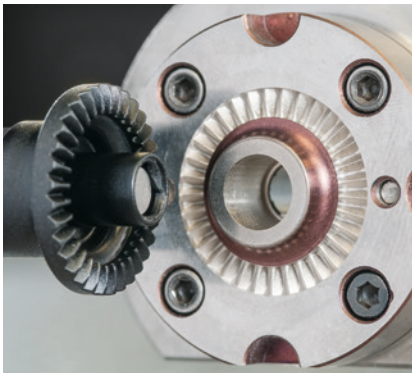
KISSsoft System Module enables users to model complete gearboxes and transmissions, bringing together kinematic analysis, 3D graphics, and user-defined tables and dialogs, allowing users to perform system level evaluations in one run while considering the interdependent effects of every single component of the gearbox. KISSsoft System Module provides tools for system reliability, load spectrum calculation, efficiency and thermal equilibrium evaluation, modal analysis, and much more.



System design considering bearings, shafts, housing, bevel or hypoid gear sets as well as the differential.



Plastic Gear Solutions



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.

Molding Solutions

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

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 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.

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.

Service Programs

Gleason's global service organization keeps customers' machines at optimum performance level, avoiding unplanned downtimes before they occur. Gleason service teams know Gleason machines by heart, and providing comprehensive and certified services.

Original Spare Parts

Original spare parts guarantee optimum performance and longevity of Gleason machines as they are tested for quality and reliability. Gleason Global Services provides more than 100,000 different spare parts from stock supplies located all around the globe.

Original Accessories

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

Gleason Fingerprint

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

Modernization Programs

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

Production Support

Gleason's Specialized Gear Services

group helps design and evaluate all types of bevel and cylindrical gears to optimum functionality and manufacturability, assisting with pre-production series and small lot production runs.

Service Apps

Gleason Global Services offers various helpful applications, such as an electronic parts catalog, Gleason's Connect Cloud, remote and augmented reality support, as well as monitoring programs.

Gleason Academy Training

Gleason offers the industry's widest variety of training classes, covering the full spectrum of bevel and cylindrical gear technology, automation, metrology, as well as gear and transmission design topics. Additionally, we offer seminars, webinars and online trainings.

E-Ticket Machine Services

Service requests for Gleason machines can be directly communicated via Gleason's e-Ticket System for immediate and effective service support.



Gleason Academy Training
www.gleason.com/training



E-Ticket Machine Services
www.gleason.com/e-ticket-machine-services

Complete Solutions from One Source



Gleason

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