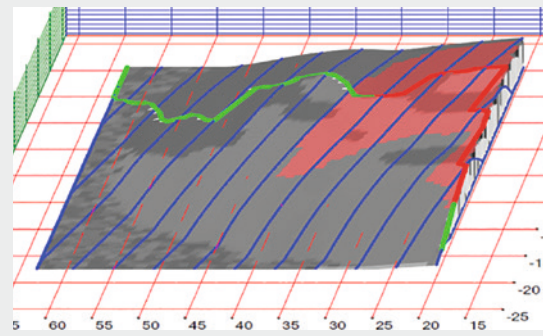
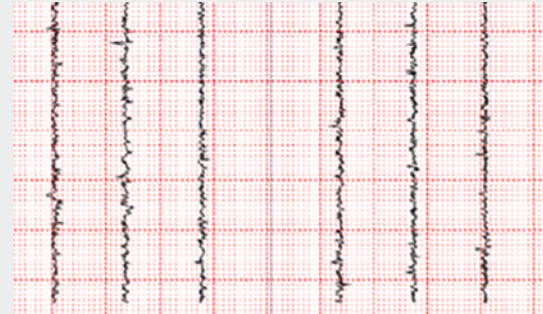


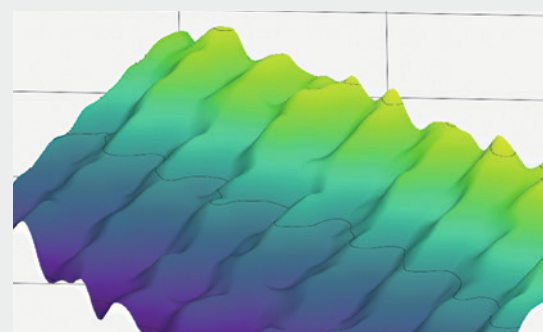
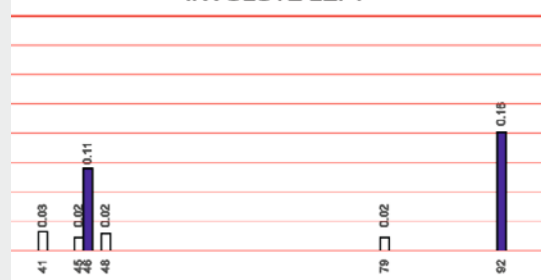


NEW

175GMS
nano



INVOLUTE LEFT



Multi-Sensor Inspection Machines
for High Precision Parts

GMS Metrology Solutions

Improving Your Manufacturing Process

Solutions for Small, Medium and Large Size Part Inspection: Lab and Shop Floor; Prototype to Production

This latest generation of Gleason GMS® metrology solutions takes gear inspection to an entirely new level, adding value and improving performance across the complete range of applications.

These Gleason systems are faster, easier to operate and more versatile than anything available up until now. They are also easily networked with the latest Gleason Gear Manufacturing Machines in a Closed Loop to improve quality and productivity while reducing scrap and rework.

Models are available for complete inspection in the lab or on the shop floor; for prototype and development jobs; and for 100% in-process inspection of gears in high volumes.

We configure your GMS Metrology System exactly the way you require it, for universal inspection applications or dedicated to your specific application.

At a Glance

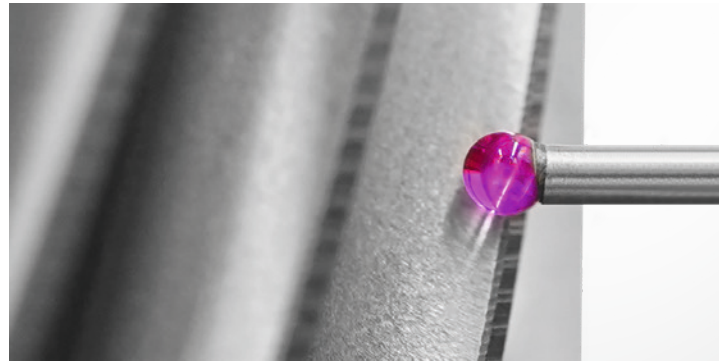
- Reduce cost of ownership by combining multiple inspection tasks onto a single platform.
- Solutions for every gear inspection challenge, whether in the lab or on the shop floor.
- Extremely versatile: GMS series as well as specialized models GMSP/GMSL/GRSL for specific applications.
- User-friendly: Powerful, intuitive Windows® based GAMA™ applications software to speed throughput and simplify operation.
- Closed Loop networking with Gleason production machines for real-time gear optimization.
- Faster throughput than earlier generations and competitive models.

Gear Noise Reduction

GMS systems can apply multiple analysis tools to help identify the root cause of gear noise, including tooth contact analysis, Advanced Waviness Analysis, surface finish analysis and Kinematic Transmission Error Prediction Software (KTEPS). The GMSL series offers non-contact laser sensor technology to capture high density data at incredibly fast speeds for faster, more accurate gear analysis. The GRSL combines laser inspection with roll testing and can analyze up to 100% of production output for gear noise emissions.

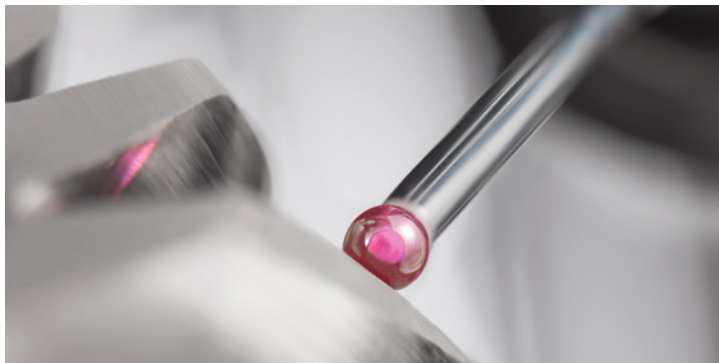
GMS / GMS nano

GMS Series for Analytical
Inspection of Small, Medium
and Large Parts.



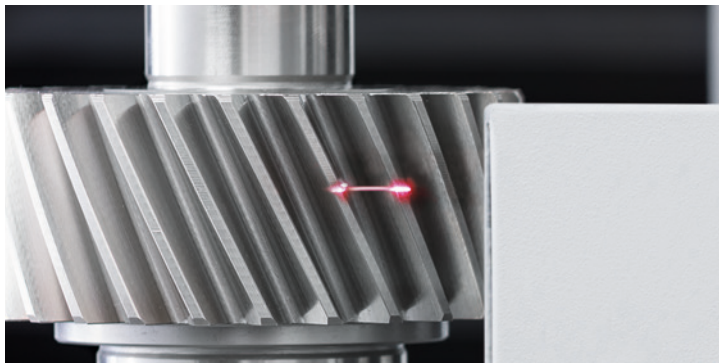
GMSP / GMSP nano

GMSP Series for Factory Floor Inspection
to Save on Queue and Transport Time.



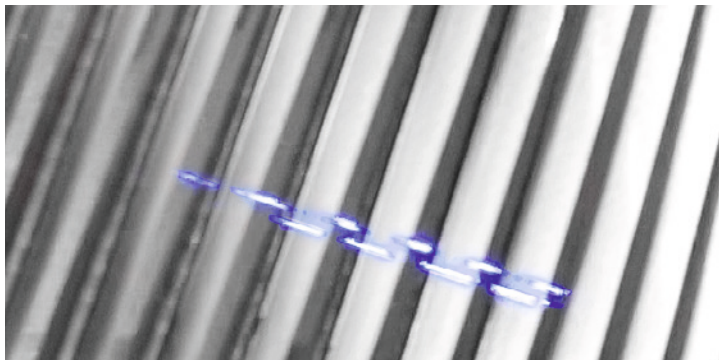
GMSL

GMSL for Non-Contact, Multi-Sensor
Inspection to Speed Gear Design and
Development.



GRSL

GRSL for Non-Contact Laser Inspection
for 100% In-Process Measurement of
Gears in High Volumes.



GMS nano Series for High Precision Inspection

175/300GMS nano

Inspection at Nano Level: Fine Pitch and Small Diameter Gears for Automotive, Aerospace, Robotics and Similar Size Applications

nano.
inspection at nano level

The GMS nano series of analytical inspection systems combines all the latest inspection capabilities into a single, compact platform for the complete inspection of gears up to 300 mm in diameter and shafts up to 500 mm in length and fine pitch gears as small as 0.15 module. Repeatability and reliability exceed VDI/VDE 2612 form standards up to factor 5.

Evaluation of Waviness at Sub-Micron Level

- Waviness-analysis for profile, lead and pitch.
- Noise analysis with highly sophisticated software tools.
- Sub-micron surface finish measurement with skidless probe.
- High accuracy SP25 3D scanning probes with a broad range of standard styli to meet various inspection challenges.

Resistant to Thermal Deviations and Vibrations

- The reference: highly accurate precision guides, laser-mapped with invar-scales.
- Optional, patented machine base with super-dampening by air-cushions.
- Table with axial air-cushioning, no stick-slip effect, resistant to potential mishaps.

Smart APC

- Optional automatic probe changer with sensor-controlled positions to avoid probe pad collisions.

Trendsetting Operation

- Human/Machine Interface (HMI) meets factory space allotment and operator preferences.
- Optional Advanced Operator Interface (AOI) offers video, telephone and voice mail messaging, environmental monitoring and bar code/QR code reading.
- Easily networked in a Closed Loop with the latest Gleason Gear Manufacturing Machines to improve quality and productivity.

Benefits

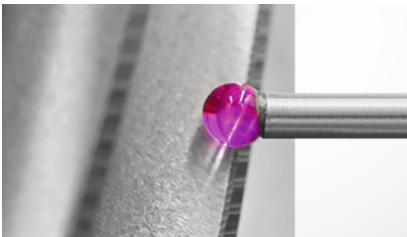
- For highest precision and repeatability.
- Evaluation of waviness at sub-micron level.
- Ideally suited for noise evaluation and analysis.
- Full range of inspection capabilities, fine pitch and CMM.
- Available in standard and "P" execution for the shop floor environment.
- True Windows® based GAMA 3.2 software suite to reduce programming and cycle times.
- Compact design with ergonomic operator work station.



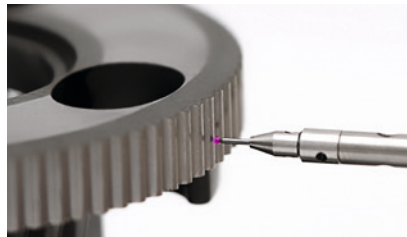
GMS nano



175GMS nano and 300GMS nano are particularly well suited for inspection of all types of fine pitch gears and cutting tools as small as .15 module, and surface roughness measurement down to .9 module.



Renishaw SP25 digital 3D scanning probes accommodate the widest range of workpiece types, sizes and applications.



Ideal for the inspection of special characteristics for example cycloidal gears.



Use of non-skidded style probe type provides surface roughness measurement capability for cylindrical and bevel gears.



Inspection of the complete range of gear cutting tools, even broaches and racks.



Smart Automatic Probe Change (APC) system simplifies operation and reduces non-productive time. 4 or 6 positions for 175GMS nano, 6 or 9 positions for 300GMS nano.

Typical chart for Advanced Waviness Analysis.



See the 300GMS nano in action.

GMSP Series for Shop Floor Inspection

300GMSP nano / 475GMSP

Putting Powerful Inspection Right on the Factory Floor

The Gleason GMSP series brings a full range of inspection capabilities to the production floor, delivering fast, precise inspection of everything from the smallest fine pitch gears to surface finish inspection and CMM measurement.

Built for the Production Environment

- Featuring a host of integrated systems that compensate for typical production floor thermal dynamics, vibrations and mitigates contamination influence on machine components.

- A unique patented base design includes an active leveling system to attenuate a broad spectrum of normal production environment vibrations, yielding measurement values in parallel with those achieved in temperature-controlled inspection rooms.
- The system identifies and applies a compensation for factory floor thermal fluctuations in real time.



Patented base design with active leveling system minimizes the effects of typical production environment vibration to help achieve measurement values comparable to the typical controlled laboratory.

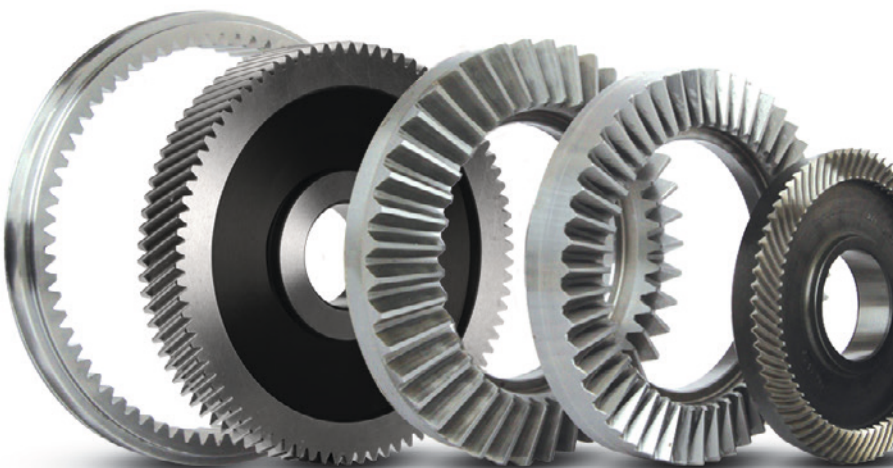


Shop-Hardened Inspection of Truck Gears and Similar Size Parts

Gleason's "P"-series technology is also available for the 475GMSP bringing shop-floor inspection to larger size and heavier parts.

A special feature of the 475GMSP is the availability of both probe heads: SP80H and SP25 depending on customers' applications and preferences, for example when measuring extreme crowning on profile and lead.

For smaller modules and measuring surface roughness the 475GMSP offers both, skidded and skidless probes.



Benefits

- Compensates for typical production floor thermal dynamics, vibrations and mitigates contamination influence on machine.
- Eliminates wasted time for part transport and queues at the lab.
- Achieves measurement values comparable to those in temperature-controlled inspection rooms.

GMS Series for Medium Sized Parts

475/650GMS

The Ultimate in Inspection Reliability and Versatility for Medium Size Parts

For gear jobbers, truck manufacturers and other producers of medium-size gears for industrial applications, the inspection workload isn't getting any lighter. These GMS systems for medium size parts take on all

the latest inspection tasks, speed throughput for the complete inspection of any gear, cutting tool or prismatic part, and operate more reliably, around the clock.

User Friendly

- Powerful, intuitive Windows 10 based GAMA applications software to speed throughput and simplify operation.
- Easily networked in a Closed Loop with the latest Gleason Gear Manufacturing Machines to improve quality and productivity.

Benefits

- Complete inspection of all types of gears, gear cutting tools and prismatic parts, up to 650 mm in diameter, lengths up to 1,000 mm.
- Simplified operation and increased throughput with powerful GAMA applications software.
- A single platform performs multiple inspection tasks including surface finish measurement and noise analysis.
- Easily networked with Gleason production machines in a Closed Loop.

Extremely Versatile

- Fast, easy, complete inspection of all types of gears and gear cutting tools, even measurement of prismatic parts.
- High accuracy 3D scanning probes with a broad range of styli and optional Automatic Probe Changer with up to 8 positions.
- Performs a wide range of surface roughness measurements, as defined in DIN, ISO and ANSI.
- Barkhausen noise analysis technology for the inspection of external cylindrical gears and external shaft diameters for residual and compressive stresses to detect grinding burn.

Built for Reliability

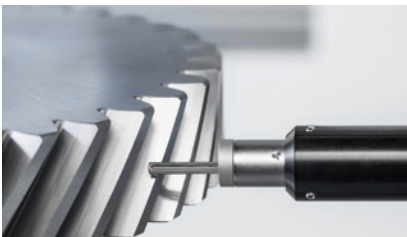
- Solid granite base (except GMSP series machines).
- All axes linear motor driven.
- 0.1 μm resolution scales (actual resolution achieved on machine is much smaller than .1 μm). Absolute scales eliminate need for "homing" sequence.
- High precision work table for increased work capacity.



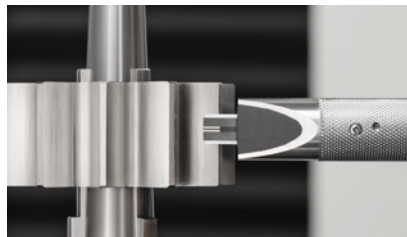


Advanced Operator Interface puts powerful tools right at the operator's fingertips, including:

- Environmental monitoring station to record temperature and humidity.
- Video telephony with Gleason Service or Application Engineering for ease of support.
- Note pad and voice mail messaging.
- Gleason Connect® for enhanced remote diagnostic support.



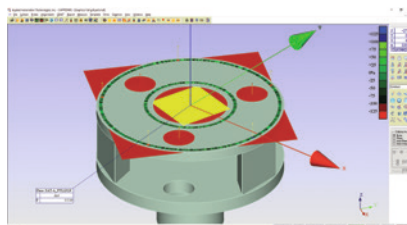
Skidded style probe provides surface roughness measurement capability as part of the normal gear inspection process, for gears down to module 1.8.



Barkhausen noise analysis technology for the inspection of external cylindrical gears and external shaft diameters for residual and compressive stresses to detect grinding burn.



By networking with Gleason's GEMS® and KISSsoft® gear design programs, GMS can take many hours out of bevel gear design and optimize production.



3D CMM measurement for position and dimension on non-gear applications.



Shaft-type parts with 1,000 mm in length can be accommodated. Tailstock with two speeds in both up and down directions and auto stop on achieved clamping force delivers faster, more consistent part loading/clamping.

GMS Series for Large Gears

850/1000/1300/1500/2000/3000GMS

Solutions for Large Size Parts Inspection: Gears and Shafts up to 3,000 mm in Diameter, Length up to 2,500 mm

The GMS series includes 850, 1000, 1300, 1500, 2000 and 3000GMS models for the inspection of larger gears and shafts up to 3,000 mm in diameter and lengths up to 2,500 mm. With their wide array of options, these larger GMS systems set up faster, operate more intuitively and automate the inspection processes to take precious time out of the complete inspection of larger, increasingly complex workpieces.

Benefits

- Complete inspection of all types of gears, gear cutting tools and prismatic parts up to 3,000 mm in diameter.
- Constructed to deliver exceptional accuracies and repeatability for the largest workpieces.
- 3D measurement and analysis functionality typically performed by a CMM available as an option.

More Productive

- GAMA, Windows®10 based operating software simplifies programming, automates the inspection process.
- 0.1 µm resolution absolute scales on all the main axes eliminates time-consuming 'homing' sequence at startup.
- Tailstock with optional two speeds both up and down for faster loading/clamping.
- Extended Journal Reference software with up to 10 mm wobble and eccentricity greatly improves the speed and accuracy of large-part setup.
- Hand-held Advanced Operator Interface enables the operator to be productive from anywhere.

Highly Versatile

- High accuracy 3D scanning probes with a broad range of styli and optional Automatic Probe Changer with up to eight racks.
- Performs a wide range of surface roughness measurements, as defined in DIN, ISO and ANSI.
- Barkhausen noise analysis technology for the inspection of external cylindrical gears and external shaft diameters for residual and compressive stresses to detect grinding burn.
- Offers multiple noise analysis tools via the power of GAMA.
- Supports all major industrial standards including AGMA, DIN, ISO, JIS, GOST, China GB and others.





Advanced Operator Interface (AOI) is particularly useful during part setup, letting you answer program prompts from anywhere in the work area. AOI connects video telephony, notepad and voice mail messaging to Gleason Service for remote diagnostics and support.



With GMS' Journal Reference software, large-part setup is much simpler, faster and more accurate. Precise alignment of workpiece to machine now occurs without the typical 'truing up' steps.

Exceptionally Accurate

- Solid granite base and the largest diameter worktable in its class for greater weight capacity.
- Meehanite® cast iron slide assemblies on all the linear and rotary axes for improved vibration damping.
- Direct-drive, high torque rotary worktable features a .15 arc/second resolution rotary encoder to ensure superior positioning accuracy.
- All the main axes are linear motor driven, with .1 micrometer resolution linear scales.
- Every axis with high performance pre-loaded bearings, precision ground guideways, passive anti-vibration leveling and temperature monitoring for exceptional drive and motion control performance.

3D scanning probes with various stylus sizes up to 800 mm in length and custom configurations including probe extensions up to 600 mm in length for internal gears.



GMSL Series for Prototyping and R&D Tasks

300/500GMSL

The Multi-Sensor Inspection System: Three Instruments, One Platform

The Gleason GMSL Multi-Sensor Inspection Systems give manufacturers a single compact, reliable and easy-to-operate inspection solution to apply the most desirable gear measurement and analysis methods for both R&D and production applications.

Extremely Versatile

- Tactile probing for traditional gear feature data collection on spur and helical gears, spiral and straight bevel gears, beveloid gears up to 300 mm / 500 mm in diameter; and many types of gear cutting tools, as well as 3D measurements and more.

- Laser probing of a similarly wide range of workpieces, a process particularly well-suited for gear development efforts where massive amounts of data need to be collected faster than feasible with conventional tactile probing.
- Surface finish measurement on gears with the ability to evaluate data with common and advanced surface measurement parameters. Supports multiple standards including ASME B46.1, DIN 4287 and ISO 13565.
- Motorized two-axis rotary positioning probe head.

Research and Development Applications

- Full tooth form scanning applications.
- Surface condition testing.
- Complex form profile scanning for rapid prototyping, reverse engineering and other typical R&D applications.

Production Applications

- High-speed topography inspection.
- CAD interface to reduce programming time for non-gear inspection.
- Soft, compliant materials, such as plastic gears.

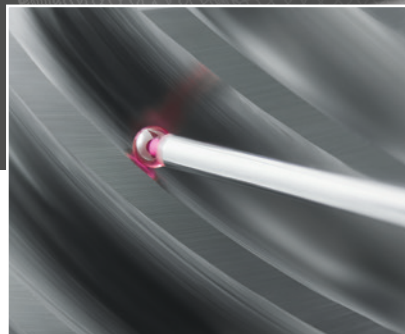
Benefits

- Increase throughput while reducing cost with a single platform offering multiple inspection methods.
- Apply advanced laser scanning technology for faster development of increasingly complex gears.
- Thoroughly inspect gears requiring exceptional surface finishes and/or low noise characteristics.
- Reads most standard CAD file formats for reduced programming time.
- Creates CAD files of cylindrical gears for reverse engineering projects.

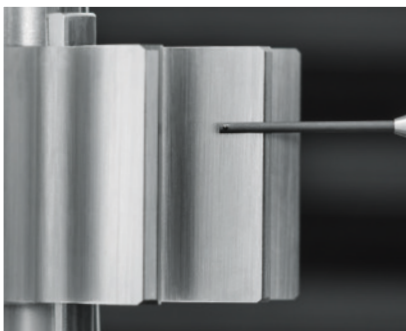




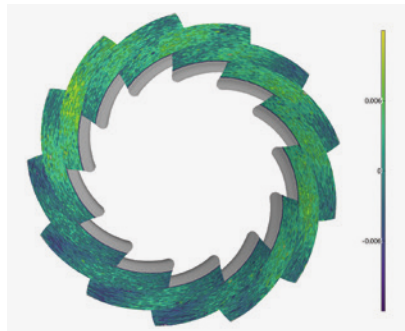
Second generation laser scanner, wireless.



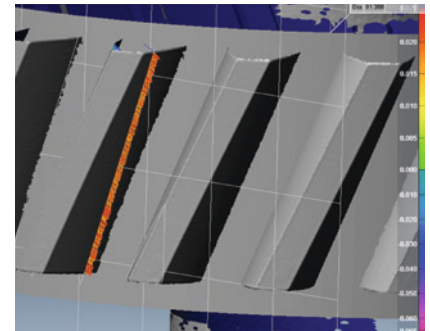
Tactile probing, for the complete inspection of a wide range of gear types, gear cutting tools and even non-gear, CMM-type measurement.



Surface roughness measurement, to help ensure consistently high-quality surface finishes.



3D laser scan for cylindrical and bevel gears. Significant benefit for the reverse engineering of gears. Colors show variations from nominal data depending on the defined tolerance band.



GMSL can take multiple complex sections on a 3D cloud point and export them to speed noise analysis.

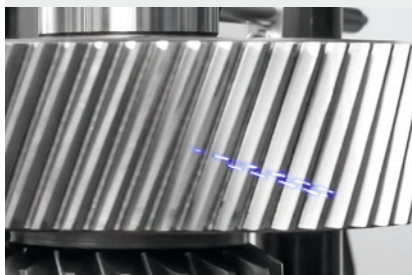
GRSL Series for Real-Time In-Process Inspection

Composite and Non-Contact Index, Profile and Lead Analyzer Delivers Unprecedented Speed and Flexibility

GRSL Gear Quality Center for the first time combines composite testing with advanced non-contact laser technology in a single system. Cycle times for non-contact index, involute and lead inspection are up to 10 times faster than conventional systems for the analysis of cylindrical gears from .4 to 7.2 module, up to 250 mm (10") in diameter.

Benefits

- Exceptionally fast non-contact index, profile and lead inspection.
- Combines composite, testing and analytical inspection into a single cycle.
- Flexibility for a wide range of analyses, including gear noise.
- Runs same GAMA application software suite as tactile systems, eliminating training for operators already familiar with GAMA.



Unprecedented Inspection Speed

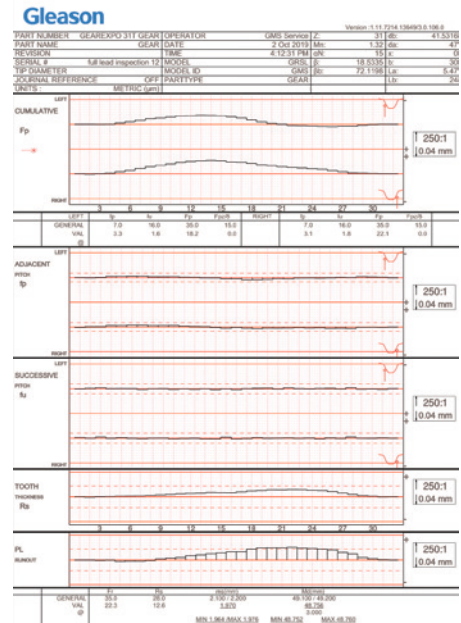
- Performs non-contact index and profile inspection up to 1600% or more faster than conventional machines.
- Inspection of all 31 teeth on a typical helical gear in under 10 seconds, as compared to the 160 seconds needed for index and 4-teeth profile inspection on a conventional analytical machine.
- Performs composite testing as well as index, lead and profile inspection in the same test cycle.
- Overall cycle time savings are even higher since analytical and composite testing are done in the same test cycle.

Greater Flexibility

- View profile characteristics for every tooth for spur and helical gears: fko, fHa, Fa, ffa, faHm, Vaf, others.
- View index: Fp, fp, Fr and Fu.
- View composite: Nick, TCV, T2T, Average DOP, Average Circular Tooth Thickness, Fi" and fi".
- Uses familiar Gleason GAMA/ WIN-ROLL™ software interfaces.
- ISO, DIN and AGMA analysis charting.



See the GRSL in action
www.gleason.com/grsl



GRSL laser scanning validates parts in seconds, up to 100% of the entire output, with realtime feedback and advanced analytics including profile, lead and pitch measurement, as well as gear noise analysis.

The Gleason Hard Finishing Cell (HFC) is the world's first fully-automated, Closed Loop manufacturing system for the production of precision gears in medium and high volumes. The

system integrates GRSL in-line gear checking with real-time analysis and automatic feedback of corrections to a Gleason 260GX Threaded Wheel Grinding Machine, as well as integration of modules for auxiliary

processes such as part washing and marking. Parts handling throughout the process is fully automated using high-speed robot and pallet system.



See the HFC in action
www.gleason.com/hfc#videos

Analytical Software Suite GAMA 3.2

The Powerful, Intuitive Interface to Optimize Every Operator's Performance

GAMA 3.2, the most powerful version ever of the popular Windows® based applications suite, opens a world of new options for growing requirements and greater profits with faster throughput.

The Power of GAMA

- Supports the complete inspection of all types of gears, including bevel, internal, external, spur and helical gears, shafts and gear cutting tools.
- Supports every optional tactile probing and non-contact laser scanning application for index, lead, and profile analysis sold within GAMA.

- Multiple waviness analysis tools to help identify the root cause of gear noise.
- Interfaces with measurement software and 3D probe measurement for Geometric Dimensioning and Tolerancing (GD&T).
- Charts easily configured to meet AGMA, DIN, ISO, JIS, GOST, China GB, and other standards including most OEM / TIER 1.
- Supports different output files, connectivity with GEARNET and VDI/VDE 2610 GDE.

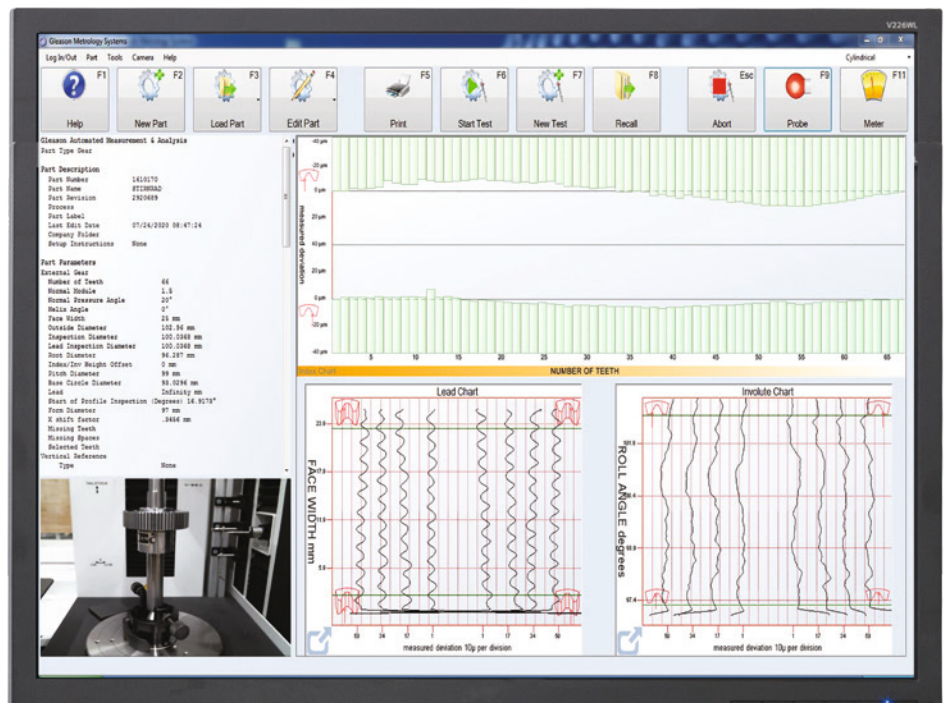
The Added Power of GAMA 3.2

- Inspect multiple tip and root diameters at selected lead positions.
- Advanced surface finish measurement, along with tolerance capabilities.
- Customizable helix and involute filter parameters for special test for latest ISO gear standards.
- Custom cylindrical gear lead and profile analysis.
- Expanded bias analysis supports cylindrical gear slope and crown tolerances for top, middle and bottom sections using custom bias charts.

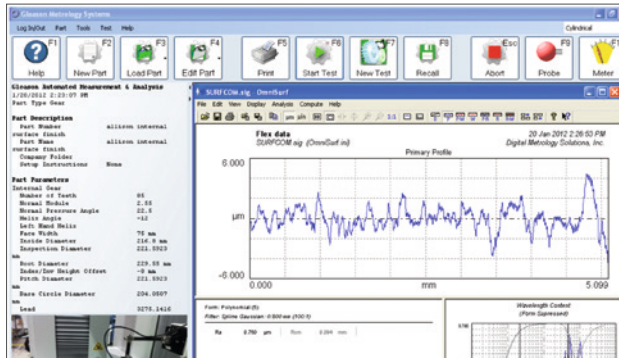
Benefits

- Greatly expanded capabilities, including gear noise analysis.
- Updated control system software delivers faster scanning and optimized probe crash prevention.
- Windows® 10 based for improved security, networking, compliance and full Microsoft support.
- 3.2 Upgrade package instantly brings legacy or later model systems to a new performance level.

With GAMA 3.2, creating a new program is as easy as point and click, regardless of experience level, language requirements or part type. Programs for future parts can be created simultaneously while inspection takes place; measured parts can be re-analyzed as well during inspection of another part. GAMA is truly a multi-tasking application.

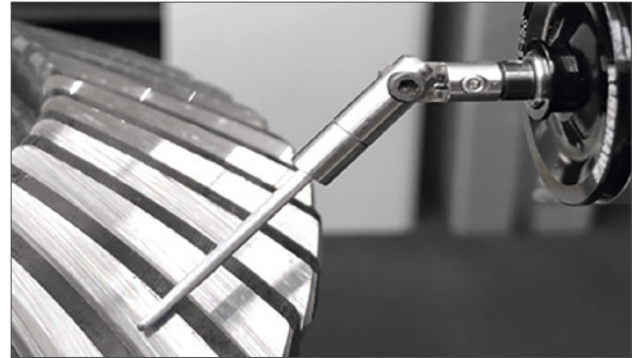


Cylindrical Gear Surface Roughness Measurement



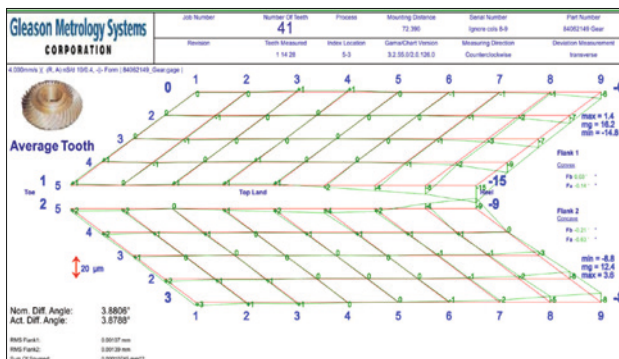
GAMA displays results as the measurement progresses, and then the completed evaluation in an easy-to-interpret graphical form. Choose from the most common parameters as defined by DIN, ANSI and ISO.

Bevel Gear Surface Roughness Measurement



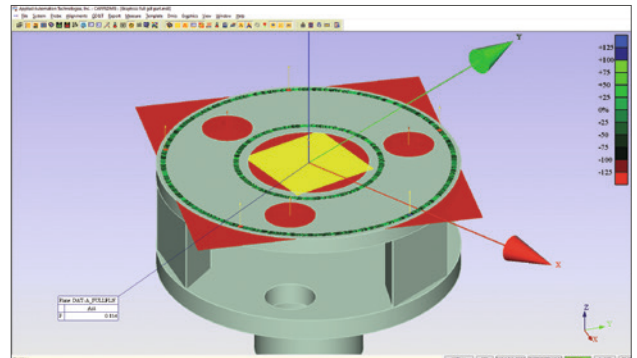
GAMA can now accommodate Surface Roughness Measurement and clearance moves of a wider range of bevel gear types and sizes, through use of a 45° tilted surface finish probe.

ENDREM™ Analysis



With ENDREM™ Analysis, one measurement flank form can be divided into two parts for better analysis of areas prone to noise.

CMM-Type Measurement

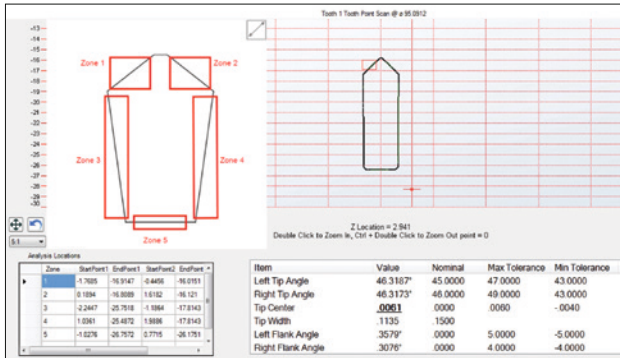


GAMA interfaces gear measurement software and Geometric Dimensioning and Tolerancing (GD&T) capability for integration of non-gear features into the common user interface.

- Find Missing Teeth' test option can now be applied for gears with large numbers of missing teeth.
- Added support for beveloid, internal, spur and helical involute gears, including setup and testing on-centerline; inspecting both flanks at same time.
- Follow Surface Journal' scan option allows probe to follow the runout of the axial and radial journals if beyond the probe travel, saving setup time.
- QC Bottom Center Utility saves time for bottom center centering setup.
- Probe Accuracy Test on Probe Calibration reduces risk of inaccurate inspections by determining whether a probe tip has a chip or other flaw.
- Probe Pad Detection automatically detects a probe pad in a probe changer station, eliminating collisions.
- Automatic multi-tip probe calibration displays all calibrations on one report.
- Allows user to require a probe calibration after a specific number of part inspections.

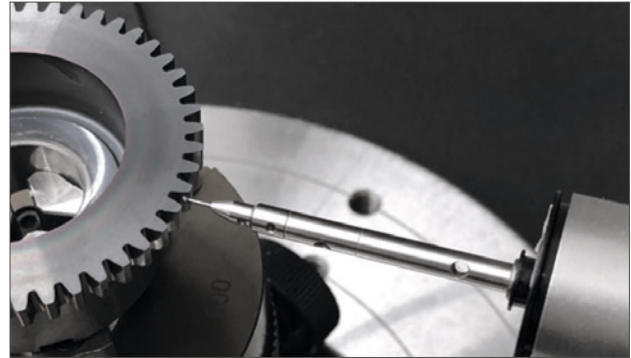
Analytical Software Suite GAMA 3.2

Transmission Gears



Even transmission gears with irregularly shaped clutch teeth and particularly tight tolerances can be easily inspected for typical features such as roof, sides, symmetry, centrality and more.

Power Skiving Cutter Inspection



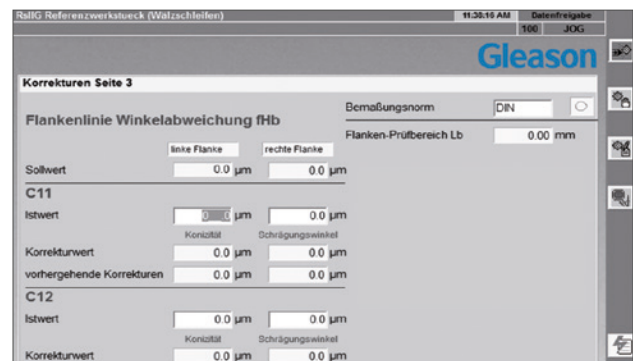
GAMA 3.2 expands the user's ability to inspect a complete range of gear cutting tools, including hobs, shaper cutters, shaving tools – and now all types of Power Skiving cutters, even in cylindrical execution.

Worm Shaft Inspection



For single-start worm shafts, GAMA 3.2 now gives users the ability to specify the number of axial pitch locations.

Closing the Loop



With GAMA, Gleason manufacturing machines can be networked in a Closed Loop so corrective actions are fast and accurate.

Enhanced QDAS Interface includes

- Import language from other QDAS configurations to the QDAS characteristic text fields.
- Enables a QDAS Shift Counter to track inspection frequency of a part for specific machines.
- Instructs QDAS to add a field on the cylindrical gear start test dialog and enter the job ticket number.
- Separate flank form deviation tolerances are now available for concave and convex flanks of bevel gears.
- ENDREM™ Analysis, using one measurement to divide the flank form into two parts for noise analysis.
- Advanced Circular Geometry programming capability to support 10-500 UPR Gaussian filter cutoff.
- Force Part Temperature Entry for all cylindrical gears can require the operator to enter the part temperature before inspecting any cylindrical gear. Part temperature growth compensation has been added to the tip and root diameter measurements.
- GD&T Workpiece Temperature Compensation of diameters and distance values based on the part temperature coefficient of expansion and nominal temperature.

- Single-start worm shaft inspection, with 'per part' capability to change number of axial pitch locations.
- XZ45D Surface Finish Probe can now be used on all bevel gear part types.
- Improved scan accuracy of surface finish of bevel gears, configured with Renishaw SP25 probes.
- Lead and profile analyses for both maximum and minimum bias tolerances.
- Vertical charts display the General Index Tolerance true position.
- Input parameters now imported to SQL, with all gear input parameters.
- Journal measurement analysis with tolerance ability.
- Journals display true position output on charts; also added to QDAS.

GAMA 3.2 Technology Upgrade for Your Existing Systems

GAMA 3.2 Upgrade Package makes it easy to take your existing Gleason inspection systems to their highest performance level – all at a fraction of the cost of new equipment. In addition to all the new features and of GAMA 3.2, the package offers you:

Windows 10 Operating System:

- Improved security and protection.
- Network and IT compliance.
- Full Microsoft support (Windows 7 support no longer available).

Industrial Grade Specially Engineered Computer Hardware*:

- Upgraded core series CPU to I5 for faster performance and better graphics.
- Ultrafast speed in start up, data access, analysis, and SPC processing.
- Screen loads and changes pages in 0.5 seconds or less.
- Solid state drives – increased reliability and less risk of failures.
- New monitor, mouse and keyboard when required.

The Latest Controls System Software:

- Improved scanning speed.
- Improved probe crash prevention.
- Increased reliability.

Application Versatility:

- Windows® 10 Operating system upgrade available for most models of SIGMA, GMM, GMS and GBX.

* Additional hardware and/or software purchase may be required for some options. An additional fee may be required for integrated third party packages. Also note that a GAMA 3.1 'Light' Update is available as well, enabling you to upgrade your machines to Windows 10 but at reduced cost. This includes new hardware, Windows 10 and proven GAMA 3.1 software. You have the option to upgrade to GAMA 3.2 at any time later.



Upgrade now
www.gleason.com/GAMA

Gear Noise Analysis

GAMA 3.2

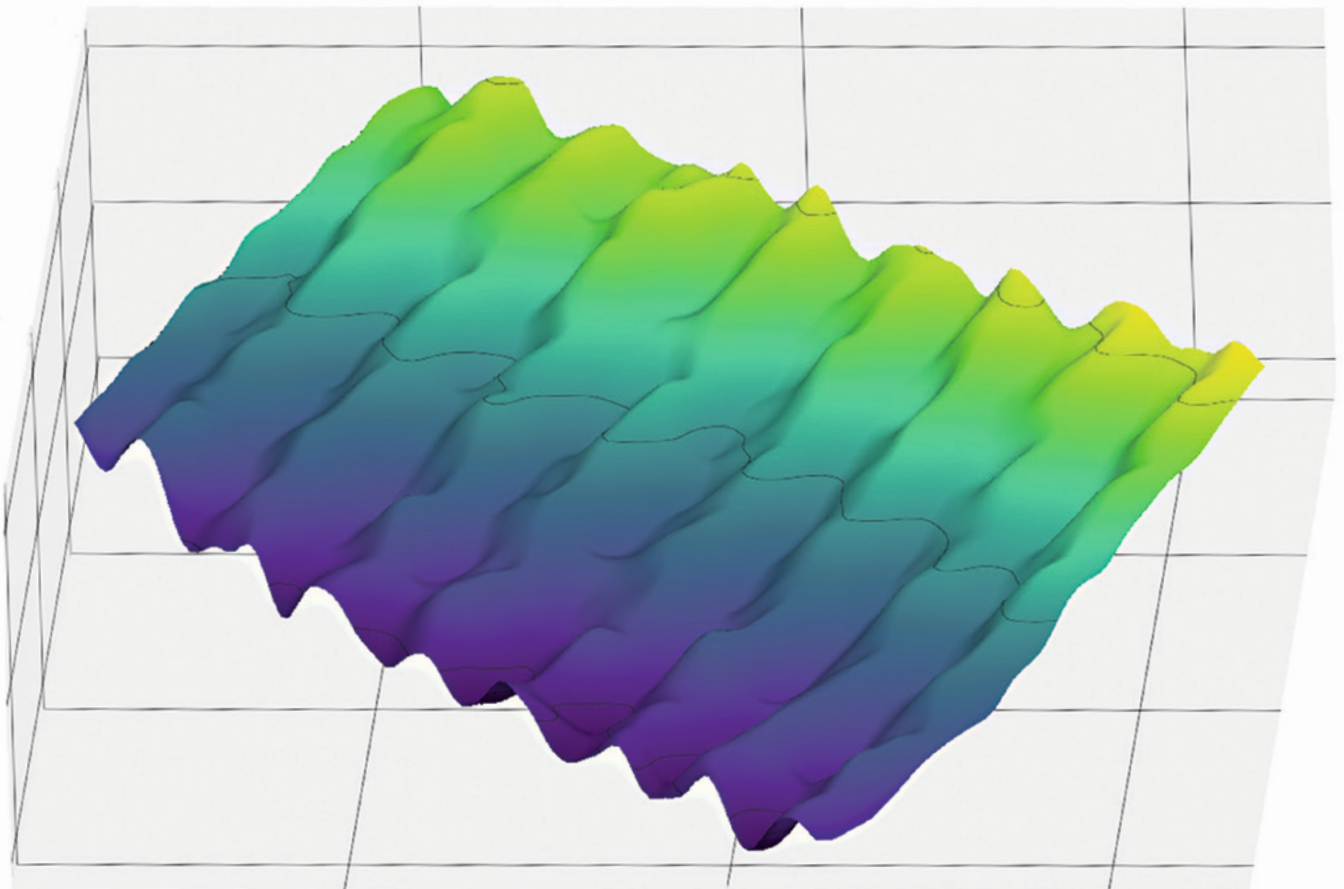
Meeting the Challenge of Gear Noise

With the surge in Electric Vehicles and other noise-sensitive applications, gear noise reduction is now of paramount importance. GAMA applications software can apply multiple analysis tools to help identify the root cause of gear noise. The input to these tools is measurement data collected during the inspection of a gear. These tools save the GAMA user time with extremely user-friendly input requirements and mathematically optimized outputs for ease of interpretation.

New Analysis Tools

The GMS series are all capable of performing contact analysis, using the same GAMA software. The GMSL series offers additional benefits, due to its ability to capture high density data at speeds up to 800% faster than tactile probing.

Gleason brings a significant advantage to its customers by combining multiple analysis tools on one platform. With GAMA, you can benefit from any/all of these powerful tools:



Tooth Contact Analysis

GAMA™ contact analysis software computes transmission error along the meshing path, generates ease off topographical charts and identifies misalignments, helping to optimize gear surface geometry.

Surface Finish Analysis

GAMA can measure up to 72 different surface finish characteristics with advanced filter methods to analyze high-frequency noise and micro-waviness.

GAMA/KTEPS

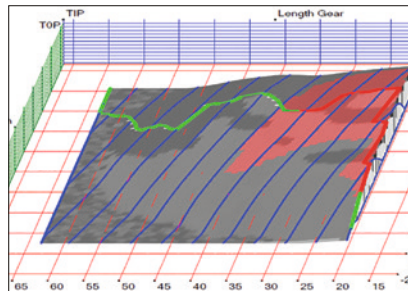
KTEPS uses a revolutionary analysis approach for determining and diagnosing gear noise. GAMA's unique ability to communicate with KTEPS puts this easy-to-use interface at your fingertips.

Smart Loop

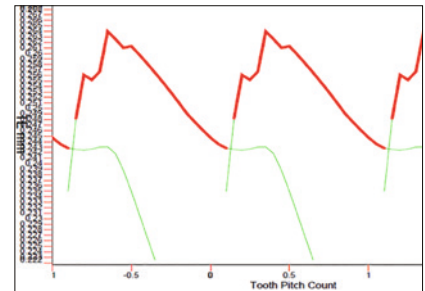
Design Engineers consider the effect of tooth bending under varying load, using tooth flank topography data created in KISSsoft for workpiece measurement, feeding back actual workpiece data for noise behaviour evaluation and loaded TCA in KISSsoft.

GAMA Advanced Waviness Analysis

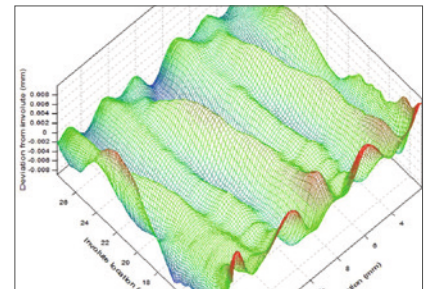
Based on traditional index lead profile inspection, the Advanced Waviness Analysis uses enhanced Fast Fourier and other technologies to evaluate noise based on Transmission Error (TE). Deploying progressive methods like patching multiple profile lines, it has the ability to detect waviness over multiple teeth, being cause for medium frequency noise and tooth flank waviness, responsible for high frequency noise. By hiding various influences like pitch and runout, a unequivocal view to individual



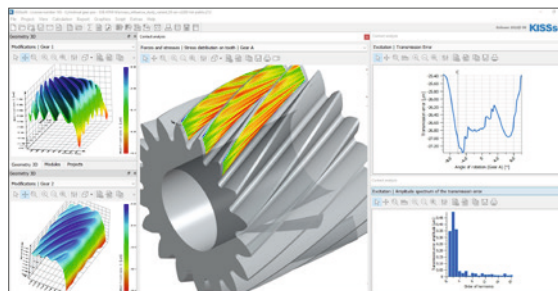
Tooth Contact Analysis



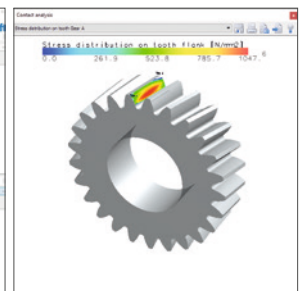
Surface Finish Analysis



GAMA/KTEPS



KISSsoft NVH Analysis (Noise Vibration Harshness)



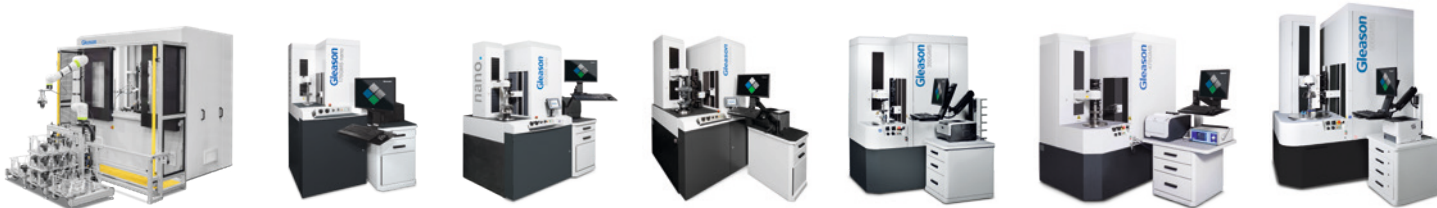
Loaded Tooth Contact Analysis

noise contributors is possible, critical influences easy identifiable by tolerance band implementation. Presentation of up to the 300th orders in an industrially recognized chart.



GAMA Advanced Waviness Analysis

The GMS Series – Small and Medium



Data / Models	GRSL	175GMS nano	300GMS/P nano	300GMSL	350GMS	475GMS/P	500GMSL
Workpiece dia., max.	250 mm / 10.0"	175 mm / 6.89"	300 mm / 11.8"	300 mm / 11.8"	350 mm / 13.8"	475 mm / 18.7"	500 mm / 19.7"
Module/Diametral pitch, range	0.4 - 7.2 mm / 64 - 3.6 DP	0.15 - 6.35 mm / 169.3 - 4 DP	0.15 - 18 mm / 127 - 1.4 DP	0.15 - 18 mm / 127 - 1.4 DP	0.3 - 18 mm / 85 - 1.4"	0.4 - 18 mm / 64 - 1.4"	0.5 - 22 mm / 50.8 – 1.15"
Helix angle (in degrees)	0 - 89.9						
Workpiece length*, max.	154 mm / 6.1"	480 mm / 18.9"	500 mm / 19.7"	500 mm / 19.7"	650 mm / 25.6"	650 mm / 25.6"	1,000 mm / 39.7"
Workpiece weight**, max.	6.8 kg / 15 lbs.	22.7 kg / 50 lbs.	100 kg / 220 lbs.	100 kg / 220 lbs.	100 kg / 220 lbs.	300 kg / 660 lbs.	300 kg / 660 lbs.
Table height	801 mm / 31.5"	1,070 mm / 42"	940 mm / 37"	937 mm / 37"	937 mm / 37"	950 mm / 37.4"	960 mm / 37.8"
Performance data							
Position measuring system	0.1 µm high resolution scales	0.0001 µm high resolution scales		0.1 µm high resolution scales			
Ambient requirements							
Humidity	Not to exceed 60 % and non-condensing						
Temperature limits in which the specified u95 uncertainty are guaranteed	GMS Models: Ambient temp.: 20°C ± 2°C / 68°F ± 4°F Thermal fluctuation: ≤ 1°C / hour; 1.5°C / day / ≤ 1.8°F / hour; 2.7°F / day Thermal gradient: ≤ 1.0°C / meter / ≤ 1.8°F / å						
Measuring range							
W	–	–	–	–	–	–	–
X	–	190 mm / 7.5"	185 mm / 8.7"	275 mm / 10.8"	185 mm / 7.3"	250 mm / 10"	350 mm / 13.8"
Y	–	260 mm / 10.2"	200 mm / 7.9"	275 mm / 10.8"	250 mm / 10"	250 mm / 10"	550 mm / 21.6"
Z*	–	340 mm / 13.4"	450 mm / 17.7"	450 mm / 17.7"	450 mm / 17.7"	450 mm / 17.7"	600 mm / 23.6"
Dimensions, weights, power							
Width****	1,765 mm / 69.5"	1,016 mm / 40"	1,106 mm / 43.6"	1,333 mm / 52.5"	1,016 mm / 40"	1,130 mm / 44.5"	1,483 mm / 58.4"****
Length****	2,345 mm / 88.5"	925 mm / 36.4"	1,000 mm / 39.4"	1,335 mm / 52.6"	1,418 mm / 55.8"	1,635 mm / 64.4"	1,650 mm / 65"****
Height	2,177 mm / 85.7"	1,982 mm / 78"	1,910 mm / 75.2"	2,177 mm / 85.7"	2,127 mm / 83.7"	2,127 mm / 83.7"	2,533 mm / 99.7"****
Machine weight	4,854 kg / 10,700 lbs.	1,542 kg / 3,400 lbs.	2,560 kg / 5,644 lbs.	4,000 kg / 8,818 lbs.	3,250 kg / 7,165 lbs.	4,000 kg / 8,818 lbs.	8,480 kg / 18,695 lbs
Packaged machine weight	6,260 kg / 13,800 lbs.	2,336 kg / 5,150 lbs.	2,923 kg / 6,444 lbs.	4,700 kg / 10,340 lbs.	4,180 kg / 9,190 lbs.	4,350 kg / 9,570 lbs.	10,854 kg / 23,930 lbs.
Power requirements	110/220 V (±10 %), 50 - 60 H						

* Larger travels for Z-axis and tailstocks available on request (not available on 175GMS).

** Heavier load capacities available on request.

*** Overall dimensions for 475GMSP model: Width: 1,397 mm / 55.0", Length: 1,857 mm / 73.1", Height: 2,390 mm / 94.0"

**** Without drawer cabinet.

All specifications subject to change without notice.

Technical Data



650GMS	850GMS	1000GMS	1300GMS	1500GMS	2000GMS	3000GMS
650 mm / 25.6"	850 mm / 33.4"	1,000 mm / 39.4"	1,300 mm / 51.2"	1,500 mm / 59.1"	2,000 mm / 78.7"	3,000 mm / 118.1"
0.5 - 22 mm / 50.8 - 1.15"	0.5 - 22 mm / 50.8 - 1.15"	0.5 - 22 mm / 50.8 - 1.15"	0.5 - 22 mm / 50.8 - 1.15"	0.5 - 32 mm / 50.8 - 0.8"	0.8 - 32 mm / 31.75 - 0.8"	0.8 - 32 mm / 31.75 - 0.8"
0 - 89.9						
1,000 mm / 39.7"	1,300 mm / 51.2"	1,300 mm / 51.2"	1,300 mm / 51.2"	1,300 mm / 51.2"	2,000 mm / 78.7"	2,000 mm / 78.7"
550 kg / 1,210 lbs.	1,800 kg / 3,969 lbs.	2,200 kg / 4,840 lbs.	2,200 kg / 4,851 lbs.	6,800 kg / 15,000 lbs.	12,000 kg / 27,000 lbs.	19,000 kg / 42,000 lbs.
960 mm / 37.8"	965 mm / 38"	1,010 mm / 39.8"	1,036 mm / 41"	1,378 mm / 54.3"	1,366 mm / 53.8"	1,378 mm / 54.3"
0.1 µm high resolution scales						
Not to exceed 60 % and non-condensing						
GMSP Models: Ambient temp.: +15-35 °C / 60-95 °F Thermal fluctuation: ≤ 1 °C / hour; 1.5 °C / day / ≤ 1.8 °F / hour; 2.7 °F / day Thermal gradient: ≤ 1.0 °C / meter / ≤ 1.8 °F / Å				GMSL Models: Ambient temp.: 20 °C ± 2 °C / 68 °F ± 4 °F Thermal fluctuation: ≤ 1 °C / hour; 1.5 °C / day / ≤ 1.8 °F / hour; 2.7 °F / day Thermal gradient: ≤ 1.0 °C / meter / ≤ 1.8 °F / Å		
—	—	—	—	400 mm / 15.7"	625 mm / 24.6"	1,000 mm / 39.4"
350 mm / 13.8"	425 mm / 16.7"	550 mm / 21.6"	670 mm / 26.3"	550 mm / 21.6"	550 mm / 21.6"	550 mm / 21.6"
550 mm / 21.6"	550 mm / 21.6"	650 mm / 25.6"	700 mm / 27.5"	850 mm / 33.5"	1,085 mm / 42.7"	1,500 mm / 59.1"
600 mm / 23.6"	1,000 mm / 39.4"	1,000 mm / 39.4"	1,300 mm / 51"	1,000 mm / 39.4"	1,200 mm / 47.2"	1,200 mm / 47.2"
1,468 mm / 57.8"	1,655 mm / 65.2"	1,655 mm / 65.2"	1,950 mm / 76.8"	2,300 mm / 90.6"	2,700 mm / 106.3"	3,025 mm / 119.1"
1,930 mm / 76"	2,175 mm / 85.6"	2,175 mm / 85.6"	2,548 mm / 100.3"	2,753 mm / 108.4"	3,150 mm / 124.0"	3,650 mm / 143.7"
2,513 mm / 98.9"	2,987 mm / 117.6"	2,987 mm / 117.6"	3,155 mm / 124.2"	3,304 mm / 130.1"	3,976 mm / 156.5"	3,985 mm / 156.9"
5,500 kg / 12,125 lbs.	8,480 kg / 18,695 lbs.	8,480 kg / 18,695 lbs.	10,200 kg / 22,491 lbs.	11,785 kg / 25,981 lbs.	19,175 kg / 42,273 lbs.	21,801 kg / 48,063 lbs.
8,480 kg / 18,695 lbs.	10,854 kg / 23,930 lbs.	10,854 kg / 23,930 lbs.	8,058 kg / 17,765 lbs.	13,425 kg / 29,535 lbs.	21,050 kg / 46,300 lbs.	26,700 kg / 58,670 lbs.
110/220 V (±10 %), 50 - 60 H						



For more information
www.gleason.com/gms

Service and Support

Keeping Your Inspection Assets Up and Running Productively – and Profitably

While your gear inspection requirements have never been more complex, getting the support you need to maximize the performance of your GMS inspection system has never been easier. Your GMS system comes the industry's most complete array of service and support capabilities. Choose from:

Basic Service Plan

Alignment checks for X, Y, Z; for top center, bottom center; A2LA measurement uncertainty report.

Silver Service Plan

Basic Plan plus: Preventive maintenance; alignment adjustments; A2LA before measurement uncertainty report; software part program back up.

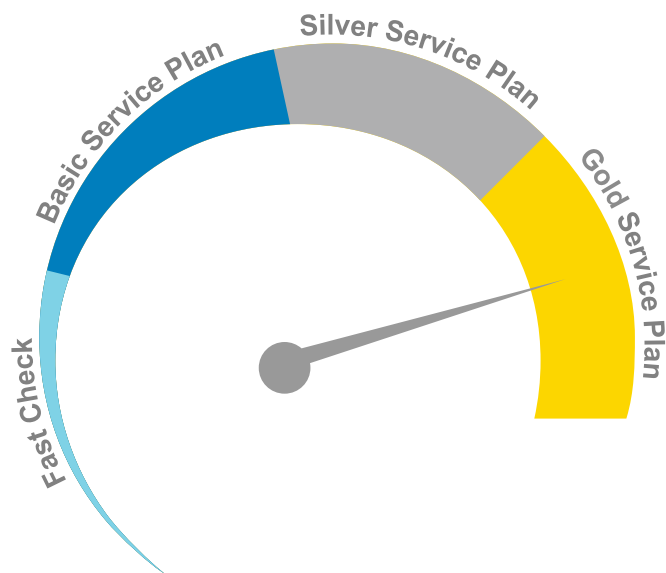
Gold Service Plan

Silver plan plus: Update of GAMA software to current levels, where applicable; software backup of new system; updated machine control software for GAMA systems; up to 10 hours telephone support during the year.

Gleason Connect Services

Gleason Connect® Service provides online support in analyzing and rectifying faults and servicing Gleason machines.

Through a secure Gleason Connect web browser, Gleason can view the screen, even create a part program. With a video interface, it is possible to observe the live inspection and support.



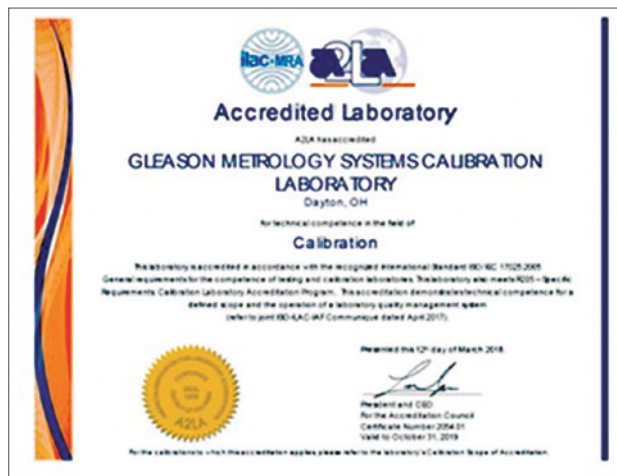
Your path to networked production

Gleason Connect is free-of-charge during warranty and already pre-installed in all current Gleason controls. Included in Silver and Gold Service Plans.

North America's First A2LA Accredited Gear Calibration Lab

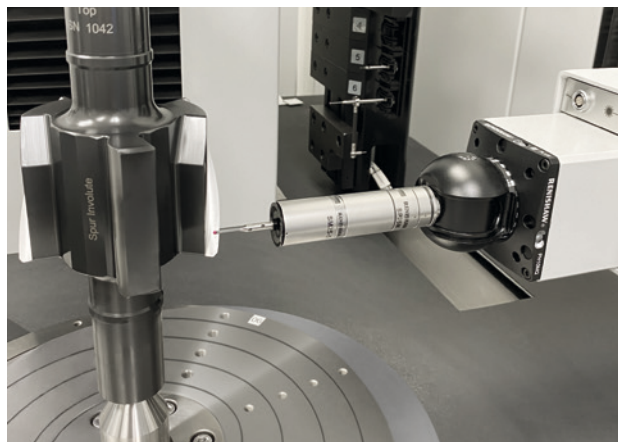
Through the Gleason Metrology Systems Calibration Laboratory, GMS has the equipment, experience, and accreditations to meet the ISO 9000 and 17025:2017 calibration requirements. With the addition of the latest Gleason 300GMSL Gear Measurement System and GAMA 3.2 analytics software, utilizing Gleason proven accuracy enhancement technologies, the measurement capabilities and scope of these calibration services are the largest in North America, and include:

- Calibration services for gears and splines including index, helix, profile, tooth thickness, dimension over pins, major and minor diameters.
- A2LA accredited on-site calibration of analytical gear and spline measurements systems regarding gear involute and helix.
- Calibration of master gears, spline gauges and artifacts.
- Master gears used for radial composite testers.
- Fellows lead and involute artifacts.
- Any other pitch, helix, or involute artifacts for qualifying gear testing instruments.
- Plug and ring involute spline gauges as well as tapered master plugs.
- Precision spheres, diameter and roundness.
- Expedited calibrations.



GMS supports ISO 9000 certification with the required 17025:2017 accredited calibration services.

- All A2LA accredited measurements are traceable to S.I. through NIST.
- Supports ISO 9000 certification with the required ISO 17025:2017 accredited calibration services.
- Non-accredited contract services for gears, straight sided splines, spiral bevels, and more up to 400mm diameter.
- Provides complete inspection needs including reverse engineering.



The lab is now equipped with a Gleason 300GMSL Gear Measurement System with all its inherent inspection capabilities.

Master Gears

High Quality Master Gears

Gleason Master Gears are used in double and single flank gear roll inspection systems, honing machines and gear measuring systems as test gears. Gleason provides different types of master gears, such as cylindrical gears and pinions, for most machines and applications.

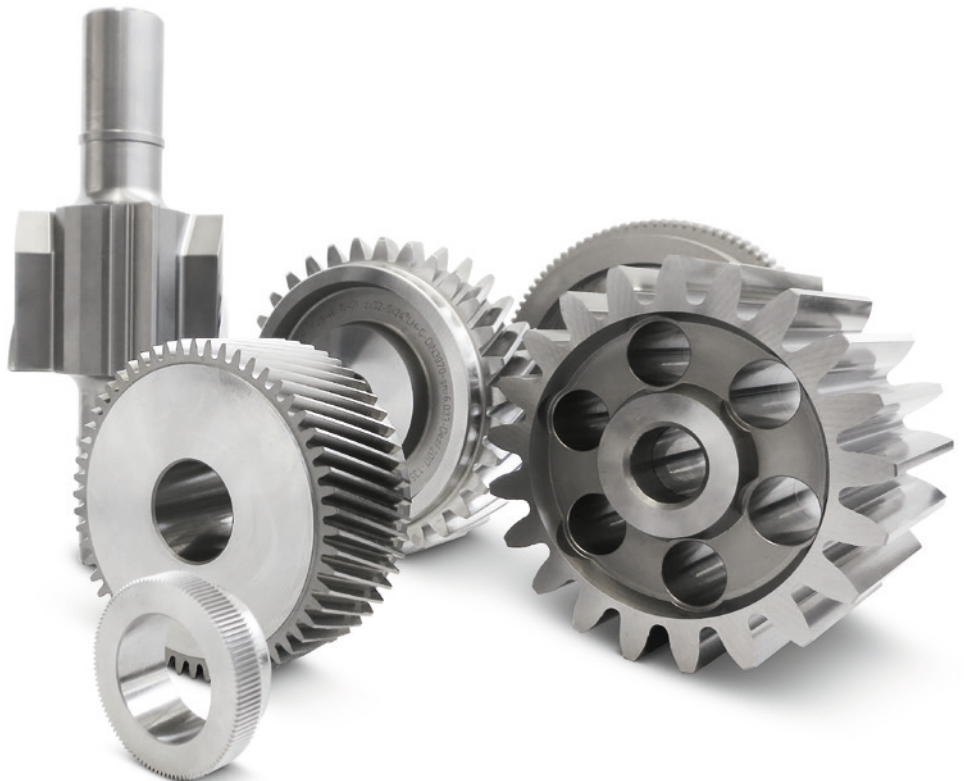
Different master gear sizes according to DIN 3970 are provided on request. These master gears are produced to quality B which relates to quality 3 regarding $F_{H\alpha}$ and $F_{H\beta}$. Master gears not requiring DIN 3970 are produced in quality 3 according to DIN 3962.

Special calibration services are available at the Gleason Metrology Systems plant in Dayton, Ohio USA. Master gears are delivered with an inspection protocol which documents measurements of the main characteristic values and defines measurement positions to meet the highest quality standards.

In general, Gleason designs master gears according to DIN 3970. On request, special designs can be provided according to individual specifications. Gleason Master Gears are designed to check the whole active tooth length of the workpiece. Additionally, Gleason adds a tip chamfer to protect the gear flanks.

Manufacturing Ranges and Materials

Dimensions	
Minimum diameter	6 mm / 0.25"
Maximum diameter spur	500 mm / 20.0"
Maximum diameter helical	300 mm / 12.0"
Minimum pitch	0.1 module / 254 DP
Maximum pitch	25.4 module / 1 DP
Maximum face width	150 mm / 6.0"
Helix angle	0 to 89°
Maximum number of teeth	550
Standard material	Tool steel 62Rc (special materials are available)



Spline Gauges and Spline Arbors

Gleason is a leading supplier of spline, tapered spline master gears, and variable spline gauges, offering design engineering services for all, with options for calibrations, coatings and setting masters. Types include:

- Involute
- Serrated
- Straight (Parallel-Sided)
- Tapered
- Spur
- Helical

Applications:

- Go and No/Go Rings and Plugs
- Tapered Master Plugs
- Variable Spline Indicator Rings and Plugs
- Setting Masters
- Expanding Collet Spline Arbors



Plug Gauges



Ring Gauges

Plug Gauge Manufacturing Ranges and Materials

Dimensions	
Minimum diameter	5 mm / 0.1875"
Maximum diameter	500 mm / 20.0"
Minimum pitch	0.1 module / 254 DP
Maximum pitch	25.4 module / 1 DP
Maximum length	300 mm / 12.0"
Maximum helix	45°
Maximum taper	15°
Maximum number of teeth	550
Standard material	Tool steel 62Rc (Special materials are available)

Ring Gauge Manufacturing Ranges and Materials

Dimensions	
Minimum diameter	5 mm / 0.1875"
Maximum diameter	500 mm / 20.0"
Minimum pitch	0.1 module / 254 DP
Maximum pitch	25.4 module / 1 DP
Maximum length	150 mm / 6.0"
Maximum helix	45°
Maximum taper	15°
Maximum number of teeth	550
Standard material	Tool steel 62Rc (Special materials are available)

Variable Spline Indicator Gauges

Variable spline indicator gauges enable manufacturers to control the fit between mating splines. Numerical values can be obtained for effective and actual tooth thickness or space width.

These gauges are available in a large variety of body styles and are highly accurate and repeatable.



Complete Solutions from One Source



Gleason

info@gleason.com
www.gleason.com

