

QUINDOS – Gearing UP!

QUINDOS is the leading modular metrology software for gearing inspection and analysis

Powerful enough to handle gear inspection tasks within the most complex and demanding powertrain industries, QUINDOS provides an unrivalled selection of modules and programming capabilities within a highly visual CAD enabled environment.



KODA[®]
ISO 9001:2015

Офіційний партнер в Україні:
УА ТОВ Фірма «КОДА»

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Supporting gear inspection across all major industries



Aerospace

Manufactured to very tight tolerances and in a wide range of high tensile aerospace materials, gear systems and components for critical in-flight applications include cylindrical gears and segments, herringbone gears, gear racks, bevel gears, worms & worm wheels, curvic couplings – demanding components that require a professional reliable software partner.



Automotive

With multiple gears, shafts and actuators for transmitting power from the engine to the wheels, automotive manufacturers need a versatile application for inspection of all types of traditional powertrain. QUINDOS can handle components with involute gearing, Hirth serration, bevel gears, worms and sprockets as well as new emobility components, including e-bikes.



Renewables

Gears in wind turbines are subject to severe cyclic loading and the failure rate is often higher than other wind turbine components. Quality control is necessary for minimising downtime and reducing the high cost of maintenance. This requires inspection of all turbine components including drivetrains, gearboxes, rotors, bearings and shafts.



Medical

Gearings used across medical applications come with a unique set of priorities; long life, smooth operation and low noise. Alongside implants and prosthetics, diagnostic and medical imaging equipment, many medical devices rely on actuators and gearboxes that require precision and repeatability during the manufacturing process.

Delivering extra efficiency through flexibility



Accuracy

- Highest accuracy and highest repeatability
- Compliance with industry standards
- Trustworthy and traceable data
- Professional reporting in accordance with standards & industry guidelines



Flexibility

- Support for widest range of gear types
- Solutions for a broad inspection portfolio
- Expandable future-oriented solutions
- Use for Reverse Engineering

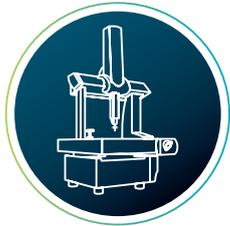


High Throughput

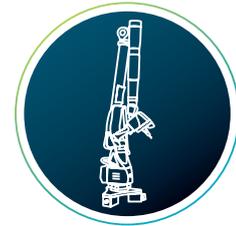
- Automated solutions
- Efficient measurement strategies
- Fast programme creation with a range of specialised modules
- Save time with rotary tables, and pallet loading
- Support for Gear Data Exchange VDI/VDE 2610

QUINDOS Gear Inspection on your CMM

QUINDOS connects with a wide range of CMMs and sensors to deliver effective gear measurement solutions.



**Small to large
volume CMMs for
measuring gears
of any size**



- Measure away from the lab with portable metrology devices
- Size of gearings only limited by measuring device (unlimited in software)
- Measure in horizontal position or use rotary table
- Allows the measurement of gear segments
- Automated execution
- Support for measurement on PointCloud/ Mesh data
- Automate batch measurement using Pallet module
- A multi-purpose solution for inspecting prismatic parts of any complexity

Special Geometry modules for all types of gears



The power of QUINDOS comes from the additional Special Geometry modules which can be added to the core QUINDOS application. They offer an unrivalled portfolio of modules for demanding gear components with challenging measurement and evaluation strategies.

The industry-tested modules comply with international standards and guidelines and have been integrated with QUINDOS to deliver automated measurement and evaluation as well as enabling guided routines for operators.

QUINDOS: the unique, cross-platform metrology toolbox

QUINDOS Basic – the CAD capable Core

Unbeatable flexibility and programming power to tackle simple and advanced part measurement for standard geometries

- Compatible with Hexagon Coordinate Measurement Machines. Additional support available for 3rd party devices via I++DME Server
- Analysis of standard and advanced geometries
- Comprehensive CAD functionalities
- Reverse engineering features
- Automatic path calculation with safety volume
- Design plot & report output
- UI Designer creates simplified user experience
- Enhanced programming functionalities
- Certified by the PTB



Special Geometry Modules

Unrivaled portfolio of modules for demanding components with unique evaluation standards

- Measurement of parts and tools for powertrain applications
- Industry-tested modules comply with international standards and industry guidelines
- Automated measurement and evaluation
- Guided measurement routines for operators

Solution Specific Modules

Power through flexibility – extend your application with additional QUINDOS Modules for advanced evaluation and measurement

- Modules for CMM and production monitoring
- Modules for advanced CAD handling & point clouds
- Modules for automation

QUINDOS: where precision comes together

The all-rounder for special powertrain components

QUINDOS gear modules have been specifically developed to meet the requirements of the gear industry. They have been developed in close collaboration with leading automotive and aerospace manufacturers.

QUINDOS ensures precise and efficient gear measurements, providing well-founded evaluations supporting international standards. All necessary parameters are specified through a standardised user interface, and the entire inspection and results process is carried out automatically.

It is also possible to perform post-processing evaluations and create inspection reports with modified evaluation parameters at any time. All QUINDOS modules can be combined in a single inspection plan, guaranteeing the measurement of complex special geometries combined in one component with the highest reliability, as well as the automatic measurement of mixed pallets for maximum efficiency.

As a professional partner, QUINDOS supports you throughout the entire process, from high-precision incoming inspection and production-related product checks to service operations that require flexible determination of gear parameters for reverse engineering processes. Additionally, QUINDOS offers comprehensive solutions for testing facilities and laboratories that work with gear gauges.

Special Geometry Modules for gears and gear tools



QUINDOS Gear

Cylindrical gears are precisely manufactured components with tight tolerances that guarantee smooth low noise power transmission.

To ensure their high product quality and conformity, the PTB-certified QUINDOS Option Gear is the comprehensive solution in gear measuring technology. Coordinate measuring machines become fully-fledged precision measuring machines – with or without a rotary table.

The gear measurement covers all common types including special designs:

- Involute gearings (Straight and helical gears, internal and external)
- Beveloid gearings
- Torus/circular gearings
- Serration and splined shaft/bore



QUINDOS Unknown Gear

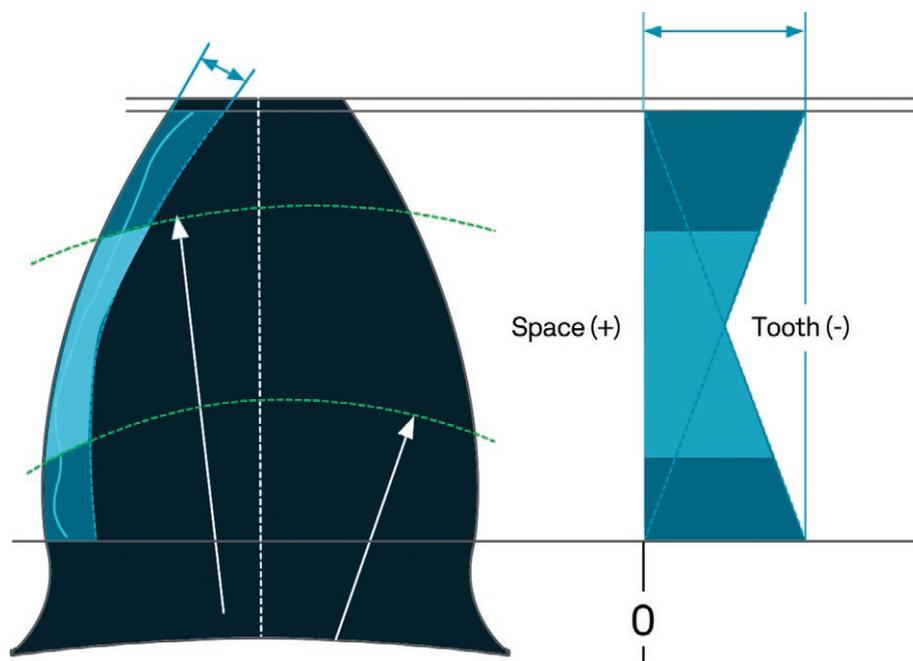
In addition to the Gear module, which covers gears and gear segments with known nominal parameters, QUINDOS offers a solution that determines the gear parameters of an unknown cylindrical or helical gear based on a few probes on a tooth – using a stationary coordinate measuring machine or a portable one.

QUINDOS calculates all necessary gear parameters such as normal modulus, pressure angle, helix angle, addendum modification coefficient and delivers the digital data set with which the remanufacturing of a defect gear can be carried out. Based on the data set, the complete measurement can also be carried out using the Gear module.

All aspects of gear measurement and analysis for all types of gears, are covered by QUINDOS based on existing industry standards and international standards:

- Profile & helix deviations
- Profile & helix crowning
- Relief and angle modifications
- K-chart evaluations
- Pitch & runout deviations
- Dimensions over 1 up to 3 balls
- Effective tooth thickness & space width
- Topography, design profile and helix

The tolerance lines for profile and flank lines can be defined individually by radii, straight lines, polynomials, and parabolas or from combinations of these geometries.



Standards Compliant

QUINDOS supports the latest international standards and industrial guidelines and is PTB accredited for cylindrical gears. Plus standards compliant reporting.





QUINDOS Herringbone Gear

Double helical gears – with gap between the helices – and Herringbone gears are a type of gear system used to transmit rotational motion between parallel shafts. They are named for their distinctive “V” shape, resembling the skeleton of a herring fish. These types consist of two helical gears positioned mirrored to each other.

The apex point (intersection point of the opposite gears) as well as the angular position will be measured and evaluated with this additional module. A combination of the modules Gear and Herringbone Gear the inspection can be done in one setup – in one inspection plan – whether with a stationary or portable measuring device.



QUINDOS Gear for Portable Devices

Gear for scannable Portable Devices is a bundle consisting of the CAD capable QUINDOS core for all standard measurements plus the special gear modules Gear and Unknown Gear. It guarantees a flexible measuring solution when it makes economic sense to position the measuring device at the point of manufacture to carry out a quick and simple inspection on site or a test in the installed state of the gearing.

Specifically for large gears QUINDOS utilises the Leap Frog method to expand the effective measuring range of portable devices.

A reliable solution for location-independent monitoring of gears between different production steps, analysis of oversized gears and for gear service and spare parts supply due to the possibility of reverse engineering the gear parameters.



QUINDOS Gear Gages

QUINDOS Gear Gages offer the ultimate solution for national standards institutes and in-house quality assurance departments. When used in conjunction with a highly accurate CMM from Hexagon, it ensures the calibration of gear gages used for calibrating gear inspection equipment.

This module covers Fellows lead and involute masters, providing a fully automatic measurement process without the need for a rotary table. As a result, increased throughput can be achieved through pallet measurements.



QUINDOS Interface Gear Data Exchange

The QUINDOS GDE interface is a manufacturer-neutral and flexible data exchange format for gear data, compliant with VDI/VDE 2610. It enables seamless communication between the QUINDOS Gears (Cylindrical Gear) option and other database systems used in design, manufacturing, or quality inspection.

The QUINDOS GDE interface option interface GDE facilitates the exchange of geometry parameters, import of measurement task-related information for profile, flank lines, pitch, runout measurement, as well as special measurements like diametral 2-ball dimension or tip and root diameter.

Additionally, it allows for the export of measurement data and deviations determined by QUINDOS.

By digitally presetting the relevant data for gear measurement and evaluation, the need for manual input of user presets is minimised, reducing potential errors in data transfer during import to QUINDOS and other databases.

QUINDOS fully supports versions 2.6 and 2.7, up to the latest version 3, of the GDE VDI/VDE 2610 guideline.



QUINDOS for Gear Racks

The Gear Rack with Constant Ratio package covers rectangular and round racks with a straight profile and constant pitch, whether straight or helical. The measurement can be taken in the unclamped condition. In the unassembled state, racks of large length and small module may have deflections and twists, which are captured during measurement. QUINDOS ensures mathematical compensation in a way that evaluates the gear geometry in the installed state, rendering expensive clamping devices obsolete during measurement.

For racks with variable ratios (VR), a QUINDOS special module is utilised to determine the variable steering ratio characteristic based on measured data. The graphical evaluation provides information about the movement of the rack and pinion from lock to lock and determines the resulting path deviation.

QUINDOS Modules for Gear Cutting Tools

High-quality gear cutting tools are essential for producing gears with precise tolerances. To ensure quality, it is crucial to have proper tool control during production and maintenance, adhering to industry standards. This is particularly important in meeting the rigorous requirements of the automotive and energy sectors, as well as maximising tool lifespan and creating optimal manufacturing conditions for highly stressed components.



QUINDOS Hob

Hob cutters are specifically designed for producing gear profiles. They consist of numerous cylindrical or conical cutting edges arranged in a specific pattern.

QUINDOS offers a specialised software module that simplifies the complex task of measuring and analysing hob cutters. This software is user-friendly and allows for measurements on both single and multiple flute hob cutters. The flutes can be straight or helical. Once the parameters are entered, all necessary measurements are carried out automatically in a single pass, and the analysis is documented with a graphical evaluation report.

The inspection of single-start hobs for involute spur gears follows the guidelines of DIN 3968. Additionally, the axial pitch and tooth height for topping hobs can be evaluated. Given the precise tolerances of hob cutters, Hexagon high precision coordinate measuring machines with continuous scanning capability are the ideal choice for this inspection purpose.



QUINDOS Broach

Broach gear cutting, also known as broaching, is a machining process used to create precise gear tooth profiles. It involves the use of a long, slender cutting tool called a broach, which has progressively larger teeth. This method can be employed to produce various types of gears, such as spur gears, helical gears, internal gears, and splines.

The inspection of broaches is a unique process that does not adhere to any specific standard. A module has been developed in collaboration with industries to ensure inspection meets proven precision specifications. This module covers the examination of key characteristics such as lead, axial runout, pitch of chip spaces, and more. It is applicable to broaches with annular and helical chip chambers, straight or helical, left or right-hand pitch. Additionally, QUINDOS Broach can measure tools for hard broaching, featuring a negative rake angle.



QUINDOS Shaper

Gear Shaper cuts the teeth into the workpiece and is used to produce high precision gears where high accuracy and quality is required.

QUINDOS Shaper is designed for inspecting pinion-type cutters used in cylindrical gears according to DIN 1829. It supports two types of shapers, depending on the shape of the cutting face: helical cutters with a conical or stepped design. All relevant characteristics are evaluated in compliance with existing standards, including profiles, helix, pitch, axial runout of the cutting edge, and much more.



QUINDOS Shaver

Gear shaving is a step before the hardening process, aiming to correct errors in index, helix angle, tooth profile, and eccentricity while improving tooth surface finish. In industries like automotive, aviation, and wind energy, precise gears are essential, making gear shaving highly significant. It optimises gear profile, enhancing load capacity and ensuring low-noise gearing.

Prioritising tool quality is crucial. QUINDOS Shaver offers a standardised solution for efficient quality assurance with coordinate measuring machines, eliminating the need for a rotary table by using a probe star. It can handle high throughput tasks like pallet measurement and provides valuable insights into helix, profile, pitch, and concentricity, aligning with graphical gear reporting.

Special Geometry Modules for complex gear components

QUINDOS for Bevel Gears

Bevel gears are widely used in various applications where power and motion need to be transmitted between intersecting shafts at an angle. These gears can be classified into two main types based on the orientation of their shafts and the direction of rotation:

- Straight Bevel Gears: These gears have straight, non-curving teeth that are cut on the cone surface.
- Spiral Bevel Gears: These gears have curved teeth that are cut in a helical pattern on the conical surface.

QUINDOS offers comprehensive software modules for both types of bevel gears. The QUINDOS Straight Bevel Gear module provides a metrology solution for bevel gears, ring gears, and master gears. It includes automated measuring run generation and comprehensive evaluation according to the quality classes of DIN, AGMA, ISO, JIS, and GOST.

The generation of the required nominal flanks of spiral bevel gears can be measured in different ways, including:

- Measuring the master flanks directly on the part.
- Importing predefined nominal points from a file.
- Generating nominal points based on CAD data.

The analysis provided by the module includes the evaluation of flank topography using different fitting methods, as well as the evaluation of profile and spiral angle deviation, pitch, runout, and tooth thickness measurement.

Additionally, the module covers the inspection of crown gears and offers flexibility in the inspection of large pinion gears. These gears can be measured in a horizontal position using fan probe configurations.

A separate module is available for straight-toothed bevel gears, which can also be used on coordinate measuring machines without a rotary table. This allows for the economical inspection of bevel gearings in large quantities on pallets. The application area also includes straight internal bevel gearings, as found in dies, erosion tools, and semi-finished products.

The evaluation spectrum is just as comprehensive for spiral-toothed bevel gears.



QUINDOS for Hirth serrations

Hirth serration rings and parts are self-centering components used in various industries such as automotive, aviation, and mechanical engineering. They are utilised to connect shafts, disks, rotors, wheels, and cranks together.



Hirth serrations are a specific type of plank serration, characterised by radially arranged teeth with a tapered symmetrical profile and flat tooth tips. This design ensures high torque stability, repeatability, and accuracy in terms of axial and radial runout. The tooth tip can also be inclined to the coupling axis for specific applications.

In the context of inspection, QUINDOS supports both upright and horizontal positioning through scanning and self-centering measurement. The evaluation process is based on standards such as DIN 3960, ISO 1328-1, and VW PV 5316, with the analysis encompassing axial runout, symmetry, pitch, angular deviations, and topography. This comprehensive analysis provides a well-founded assessment of component quality, accompanied by informative graphic documentation that presents the results in a clear and concise manner.

QUINDOS for Curvic Couplings

Curvic coupling is a type of high-precision connection mechanism used in heavy machinery and equipment. It involves curved teeth that provide a larger contact area and enhance load carrying capacity. To ensure the accuracy of these connections, a manual visual inspection process is



typically employed, comparing the production masters to a Master Curvic and periodically checking against a golden master. This procedure is prone to errors, time-consuming, and requires significant logistical efforts.

The QUINDOS software solution offers a digital golden master for the inspection of Curvic couplings. By simulating the pairing with a production or golden master, QUINDOS eliminates user influence and provides comprehensive analysis results in digital and graphic formats. It determines the nominal geometry of the master, performs metrological analysis by pairing with the digital master, evaluates the geometry parameters and topography of the contact pattern, and provides correction data for manufacturing.

With its intuitive user guidance, QUINDOS Curvic Coupling serves as an all-rounder in ensuring the accuracy and efficiency of Curvic coupling inspections.

It streamlines the process, reduces errors, and eliminates the need for manual inspections, ultimately saving time and resources.

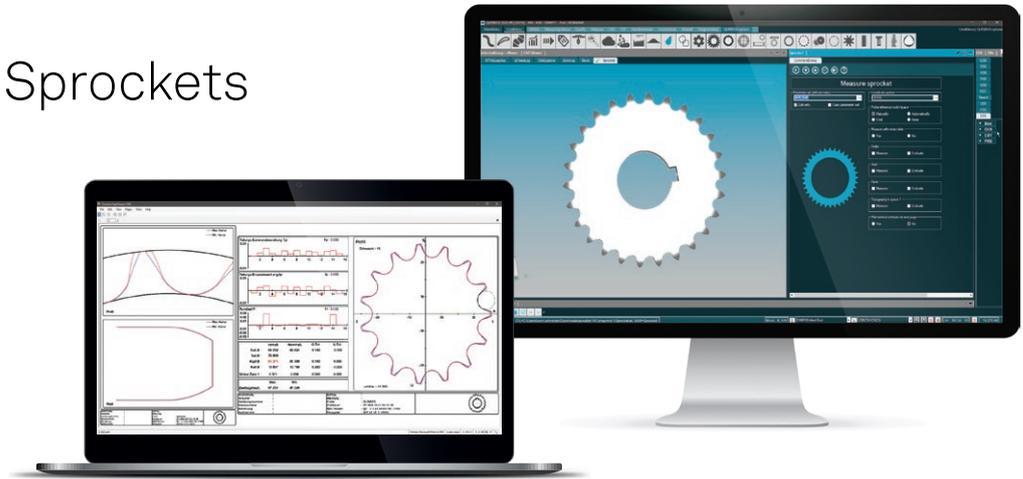
QUINDOS for Sprockets

A sprocket is a toothed wheel or gear that is used with a chain, belt, or other flexible linkage to transmit rotational motion or power between two or more shafts. The QUINDOS option Sprocket allows for the measurement of sprockets with three different profile types:

- Type A: Maximum and minimum profile with radius and angle
- Type B: Profile according to ISO 606 and DIN 8196-1
- Type C: Flank angle and roller radius according to DIN 8196

These profile types refer to the definition of the sprocket's profile. In the automotive industry, type B is the most common, where the profile is defined by roll, root, and tip diameter. If these parameters are known, the QUINDOS option automatically calculates the other parameters according to ISO 606.

Based on the entered data, the program calculates the permissible minimum and maximum sprocket profile.



QUINDOS for Worms, Pinions & Worm Wheels

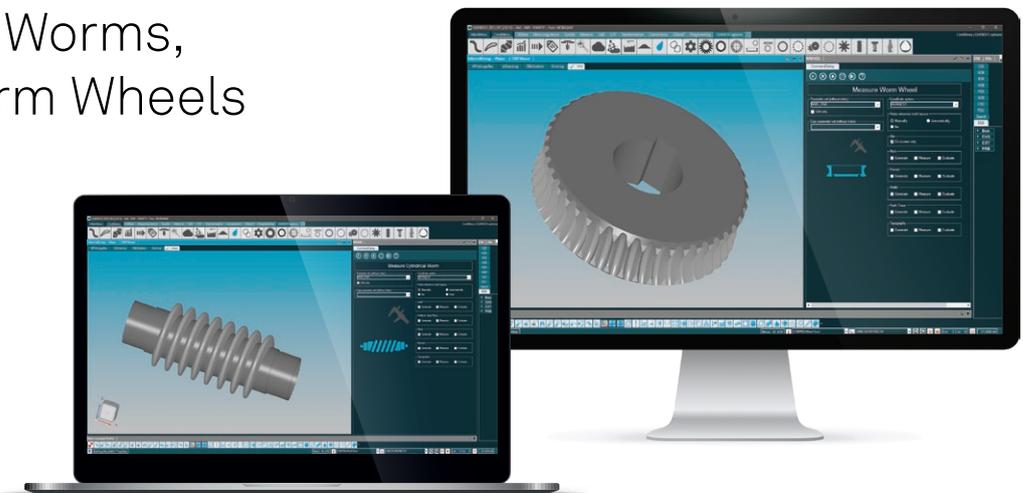
Worm gears are mechanical power transmission systems consisting of a helical screw-like component called the worm and a gear-like component called the worm wheel. QUINDOS supports the metrology inspection of worm gearboxes on CMMs with special modules for the following components:

- Cylindrical Worms of types ZA, ZI, ZN, ZK, and ZC according to DIN 3965
- Worm Wheels for Cylindrical Worms of types ZA, ZI, ZN, ZK, and ZC
- Globoid Worms (enveloping worms)
- Tapered pinions for spiroid gear drives (Spiroid® or Helicon® gear)

The evaluation of Cylindrical Worms includes the analysis of pitch, profile, topography, and runout. The ball mass is also determined. The inspection scope for Globoid Worms and Tapered pinions is based on this. Both variants can be inspected in both horizontal and vertical measuring positions.

In addition to the standard evaluations, the QUINDOS package for worm wheels of cylindrical worms also enables the best fit of the axial position of the worm wheel. This allows determining the optimal mounting position, thus optimising production.

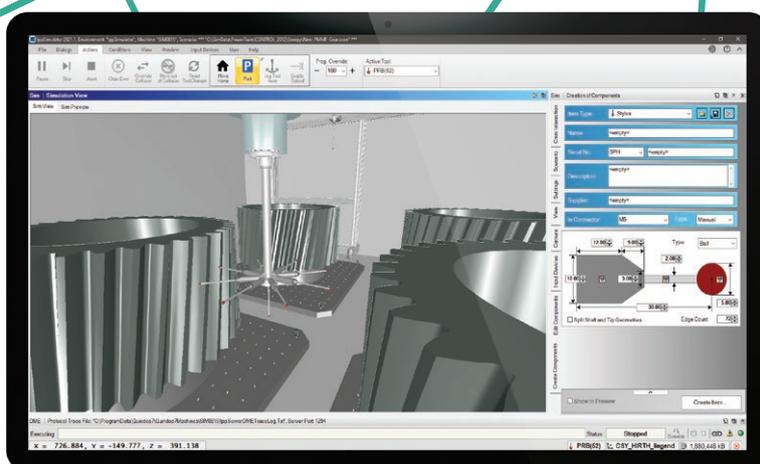
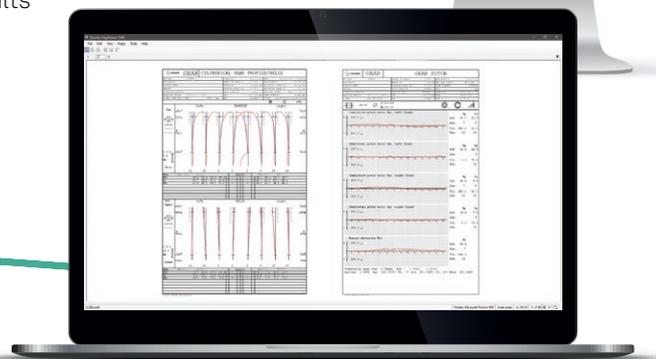
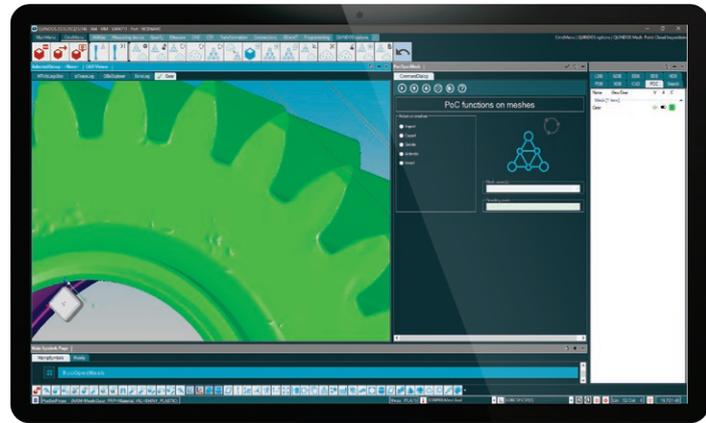
The evaluation of the worm wheel also assesses the flank and the axial best fit with determination of the displacement.



QUINDOS Inspection on Meshes & Point Clouds

QUINDOS provides a unique solution in the field of special geometries:

- Programming and evaluation of special gear parameters on meshes and points clouds independent of the source with the same workflow as on the real machine – but only on the digitised part.
- Same professional programming and documentation as usual for special geometries.
- Comparability of results with different devices – tactile or optical – because the same programs and evaluation methods are used.



I++ Simulator

- Used for offline programming with the digital twin
- Check measurements with specifically selected clamping fixtures
- Fast adaption of programs to other devices in real or virtual environments

Do more with your gear measurement data

Results are provided in a range of handy, easy to share formats such as Plots (graphical evaluation) as PDF. Additional export via ASCII and CSV: Profile/Lead – Profile/Lead large plots – Pitch, Runout and Eccentricity Evaluation – Topography.



Plug into your Statistical Process Control System

QUINDOS has an interface with Q-DAS SPC software for analytics and insights on production efficiency. With a wide range of modules and extensions, Q-DAS supports quality assurance, capability evaluations and parameter-based process controls.

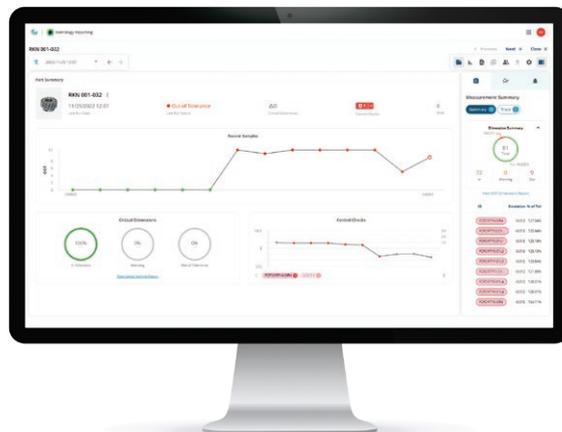
Simple, intelligent, and accessible cloud-based reporting and visualisation

QUINDOS is also compatible with Hexagon's Metrology Reporting application. It provides real-time information and insights, enabling increased productivity based on data-driven decision making.

Metrology Reporting is a valuable analytics tool, providing intelligence that might otherwise get missed. Collaborate easily and share key reporting data with colleagues without attaching reports to emails.



Q-DAS: statistical process control (SPC): improve quality, reduce costs and bring transparency to manufacturing processes through data-driven decision making.



Metrology Reporting: Intuitive UX and user driven workflows provide quick and efficient access to data and insights.

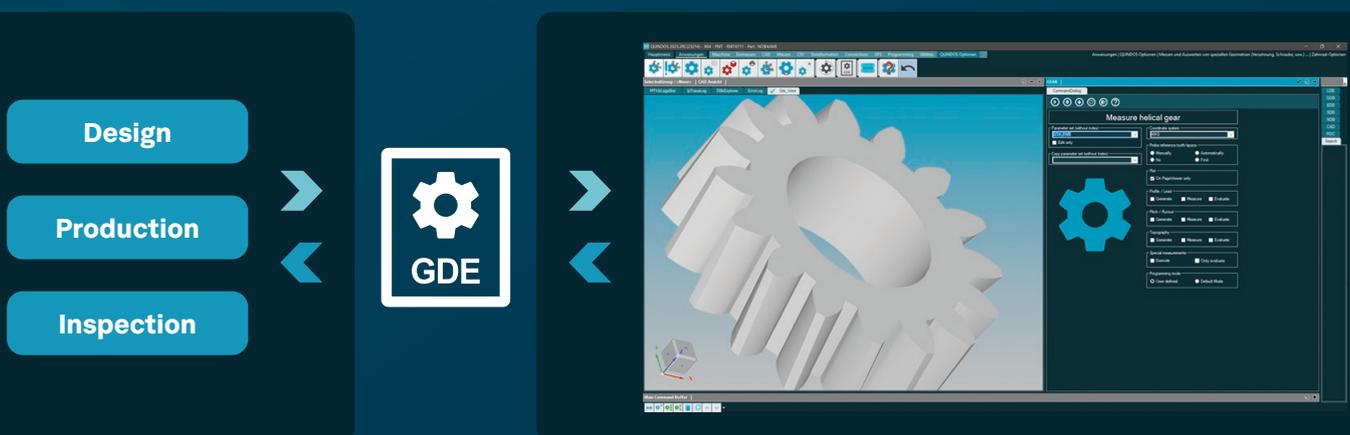
QUINDOS and GDE (Gear Data Exchange)

GDE offers the advantage of standardised communication and collaboration between different stakeholders throughout the gear lifecycle – from conception to design and metrology. This includes gear component manufacturers, suppliers and end customers. GDE helps standardise gear data exchange and promotes more efficient collaboration across the gear industry's systems and process steps – eliminating redundant inputs and automating data exchange.

GDE typically includes parameters and attributes that describe the geometric characteristics, material properties, and performance specifications of gears. This can include details such as tooth profile, module, pitch diameter, pressure angle, helix angle, backlash, surface finish, material properties, and more.

The GDE file contains all the necessary geometric parameters for gears, including their modifications and tolerances, which are necessary for metrological exchange and also evaluations and measurements.

By using a standardised data format like GDE, QUINDOS is able to communicate with other software tools or systems to seamlessly exchange gear data without the need for manual translation or re-entry of information. This helps improve interoperability and efficiency in the design and manufacturing process of gears.



Hexagon's complete solution for digitising gear manufacturing



Metrology meets simulation to deliver continuous improvement

QUINDOS is part of Hexagon's ecosystem of industry leading software applications and metrology devices. Using GDE (Gear Data Exchange) to seamlessly transfer data, manufacturers are able to streamline processes and make workflows more efficient. With a closed loop production cycle that includes Romax simulation software and QUINDOS, gear manufacturers can continually improve their design, streamline processes and adapt faster with data driven insights.

Working with you to develop bespoke gear measurement applications

With Hexagon's global presence extending to over 70 solutions centres globally, experienced engineers are on hand to help you develop bespoke applications for the most challenging gear inspection projects.

Integration with your existing systems and processes are also possible thanks to a wide range of add-on solution specific modules, standard interfaces and open database architecture. Customer applications can be individually designed and adapted – from inspection plans to turnkey solutions, measurement rooms and automated assembly.

QUINDOS is available with a software maintenance agreement (SMA) offering you access to the latest versions of the software at every release as well as comprehensive technical support and much more.

Case studies

BMT Aerospace International

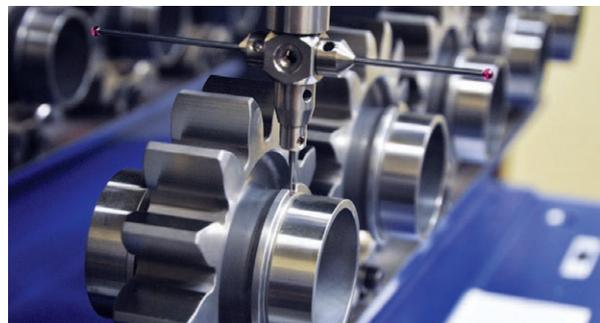
BMT Aerospace are a Belgian based producer of gears for aerospace applications operating across three international production facilities. Their factory in Oostkamp, Belgium, specialises in the production of all sizes of pinions and sector gears used in the Aerospace industry.

Alongside accuracy targets in the micron range, efficiency and throughput are critical to their operation. BMT invested in QUINDOS as their key metrology application and is used with three Hexagon CMMs. In particular, BMT have been able to reduce bottlenecks by using QUINDOS' special option for measuring workpieces on pallets. Its ideally suited for measuring gearwheels and can be used to automate routines in 24-hour mode. Gears are loaded on the pallets for measurement using QUINDOS and the process then runs automatically through the night.



Our efficiency in the measuring room has much improved through Hexagon Metrology's solution."

Freddy Cherlet,
Head of Quality Control



BMT are also able to load CAD models provided by engineering into QUINDOS. Now they can more easily visualise and create their inspection routines in an intuitive CAD based environment.

BIMAQ

In cooperation with PTB, BIMAQ is involved in the development of large gear standards with diameters < 2000 mm. BIMAQ analyses the cause-effect relationships between gear manufacturing, geometry deviations and gear defects. Plus the development of new production and measurement strategies.

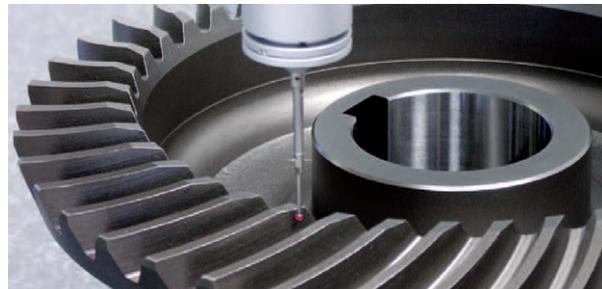


QUINDOS is used with modules for gear measurement, gear gauge inspection and calibration. It enables users to take full control of every aspect of measurement and evaluation. BIMAQ use their software with the PMM-F 30.20.7 CMM and a loading system for easy part positioning for large and heavy (up to 6 tonnes) components. The ultra-high accuracy of the CMM allows measurement and evaluation of even large components for advanced research purposes. A rotary table for rotationally symmetrical components with diameter up to 3.000 mm is also part of their solution.

BP Riduttori

Established in 1968, BP Riduttori are a renowned engineering company supplying a vast array of gears and gear teeth to the transport, railway and pharmaceutical industries.

The high-quality gears and gearboxes they produce are often based on a customer's drawing or on a sample, often producing small lots rather than large batches. This means their portfolio is diverse and covers a wide range of different gears, from the most common spur gears and helical gears to Gleason spiral bevel gears, differential reduction gears, bevel gears, worm screws, drive shafts, gearbox speed multipliers, angled gear units and worm screw jacks.



They use QUINDOS alongside their DEA Global Silver 9.12.8 CMM. With their high degree of specialisation in the field, they chose QUINDOS plus a range of special geometry modules dedicated to specific gear types. This provides them with a detailed analysis of every gear type, as well as inspection reports that ship with their products and certify their quality.

“ QUINDOS and its application modules have been created with attention to the specific requirements of gear manufacturers. It is unlike other more general packages, which require more processing and are not always capable of providing all the results we need.”

Federico Bortolami,
Technical Director



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Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that use data from design and engineering, production and metrology to make manufacturing smarter.

Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at hexagon.com and follow us [@HexagonAB](https://twitter.com/HexagonAB).