

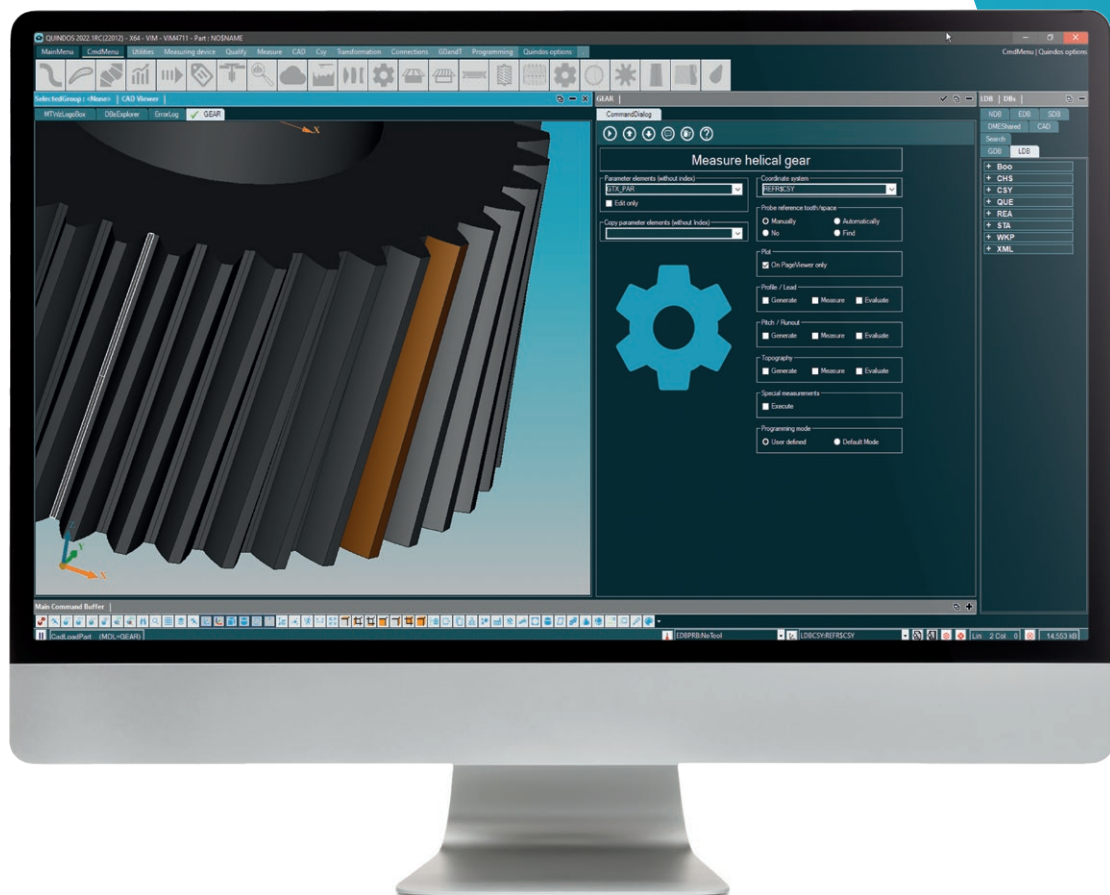
# QUINDOS

Advanced metrology software



# QUINDOS

The leading modular metrology software for special geometries used in aerospace, energy, automotive, and engineering



**Measure anything from machined parts to gears, blades, screw compressors, camshafts and more on a wide range of CMMs**

Powerful enough to handle the most complex and demanding metrology projects, QUINDOS is the expert application for regular, free-form and special geometries including gears, gear tools, blades and other challenging applications. With an unrivalled selection of modules and programming capabilities, QUINDOS is CAD enabled and provides a highly visual environment for managing the most complex measurement and inspection tasks.

# One powerful application for simple or complex inspection tasks



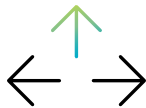
Flexible CAD capabilities enables complex part geometry to be manipulated and measured in 3D



Extensive range of modules for special geometries



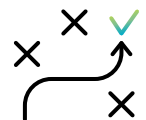
PMI ready - automate programme creation by importing data from native 3D CAD models



Extensible: QUINDOS grows with the portfolio of the application & the customer



Connect to monitoring and data analytics packages such as Q-DAS and Metrology Reporting or integrate with third party solutions



Intuitive, visual UI enables operators to access programmes, drive routines and make simple decisions quickly



Programming power for the creation of sophisticated applications



Wide range of supported tactile, optical and multi-sensor CMMs and accessories



Futureproof - older programs can be used in newer versions



Standardised reporting compliant with international industry standards. Integrated tools to create sophisticated tailored reports for customers' specific purposes



# Aerospace

Precision is essential – parts must comply with regulatory standards. Gear systems and components for critical in-flight applications include Blades and Blisks, Epicyclic Gearboxes, Curvic Couplings, Housings, Shafts and more.

# 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 as well as new emobility components.





# Renewables

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 – plus large and complex components. All essential for optimising quality in production and service.



## Medical

Medical applications come with a unique set of priorities; small size, high speed functionality and low noise levels. This requires high precision manufacturing and inspection of components used in surgery tables, patient beds, diagnostic machines, scanning equipment as well as the production of implants and prosthetics.

# Solutions for complex geometries

## Professional solutions for gears

PTB-certified module, all-in-one solution for involute, beveloid and toroidal gears of any size:

- Measurement and evaluation compliant with international standards for profile, helix, pitch, runout, topography and more
- Determine unknown gear parameters easily
- Solutions for high-precision calibration of gear gauges

## Bevel gear solutions

QUINDOS offers solutions for straight and spiral bevel gears - including crown gears.

- Functional measurement with minimised topography deviation
- Professional evaluation of all relevant parameters
- Measure tool moulds or corresponding erosion electrodes



## Gear rack solutions

Modules for gear rack measurement and evaluation:

- Straight-toothed or helical gear racks with straight profiles with rectangular or round carriers
- Option for evaluating variable ratio racks, based on an axial scan

## Worm drive components

QUINDOS is the all-rounder for worms and worm wheels and offers modules for:

- Wheels for cylindrical worms
- Cylindrical worms (single and multi-start)
- Globoid worms (single or multi-start)
- Tapered pinions for spiroid gear drives

## Unique portfolio for cutting tools

For tool manufacturers QUINDOS offers professional metrological standardized solutions:

- Hobs (single/multi-start hobs, straight/helical flutes)
- Internal gear broaches
- Pinion cutters
- Shaving cutter
- Application for surface broaches with special profiles and internal gear broaches

## Thread solutions

For internal, external, single, multi-start, straight or conical threads. Solutions for high-precision application of thread gauges in calibration laboratories.

- ISO metric threads
- Pipe threads
- ACME threads
- Buttress threads
- Steel conduit threads
- Whitworth threads
- API threads
- NPT threads



## Transmission components for engines and machines

Standardised and specialised transmission applications developed in collaboration with industry leaders:

- Chain wheels for roller chains
- Camshafts and complementary cams
- Step gears
- Screw compressors (male and female rotors)
- Hirth serrations
- Curvic couplings
- CAPTO (PSC) profiles

## Turbine components

Measurement options for turbine blade features - from root to profile measurement.

- Quick evaluation and analyses of profile characteristics and dimensions with QUINDOS Blade
- QUINDOS Blade Ultimate provides advanced profile evaluation functions for blade profiles and segments
- A comprehensive library of industry-specific evaluation routines can also be added

# 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

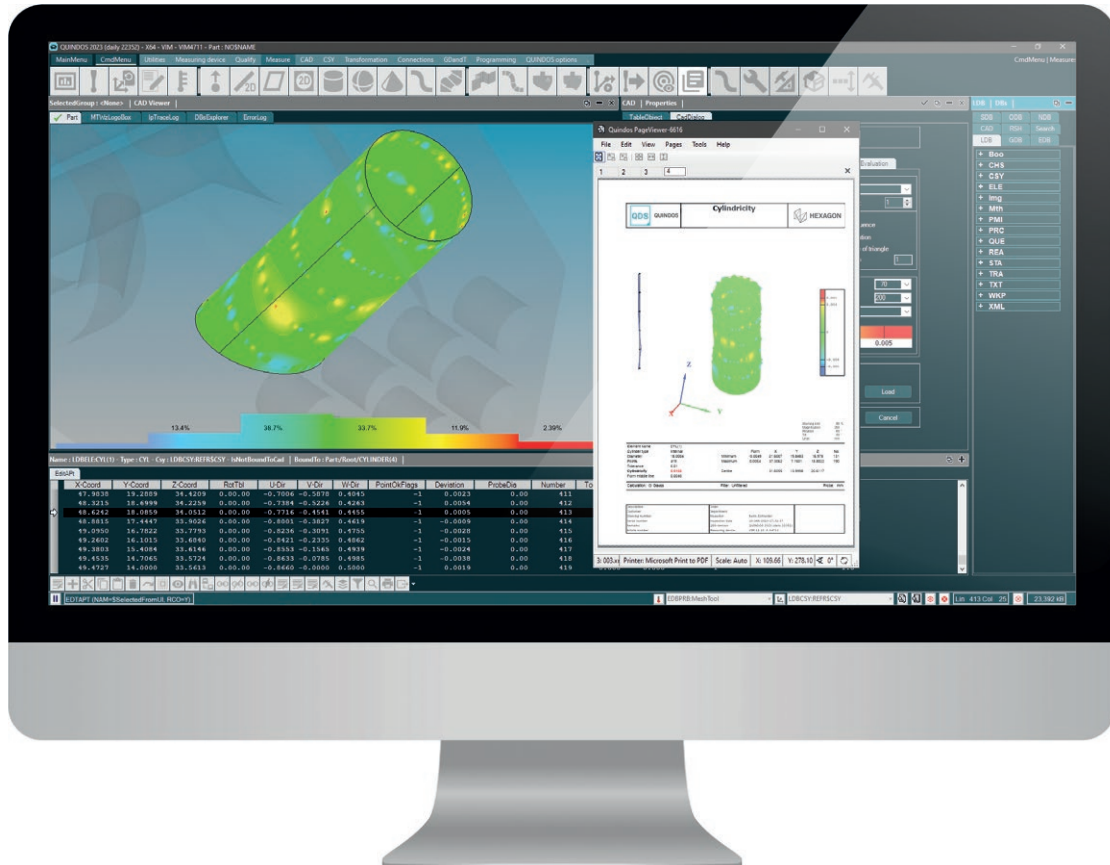
## Solution Specific Modules

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 Basic

The metrology software solution for everyday measurement tasks and the foundation for developing applications for non-standard geometries



- **Comprehensive inspection planning** with CAD for IGES and STEP models
- **Structured programming** – build your own command library or custom operator UI
- **Standards compliant**  
In line with latest GD&T standards
- **Intuitive, graphical UI** with intelligent icon-based user guidance
- **Advanced CAD model handling** for cleaning, transforming and mirroring of models
- **Support for formulas**, mathematical functions and variables
- **Standardised and customisable reports** for special evaluation tasks
- **Safety volumes** guarantee collision free path generation around the component
- **Non-CAD programming**  
Comprehensive analysis for parts without digital twin

# QUINDOS Special geometry solutions

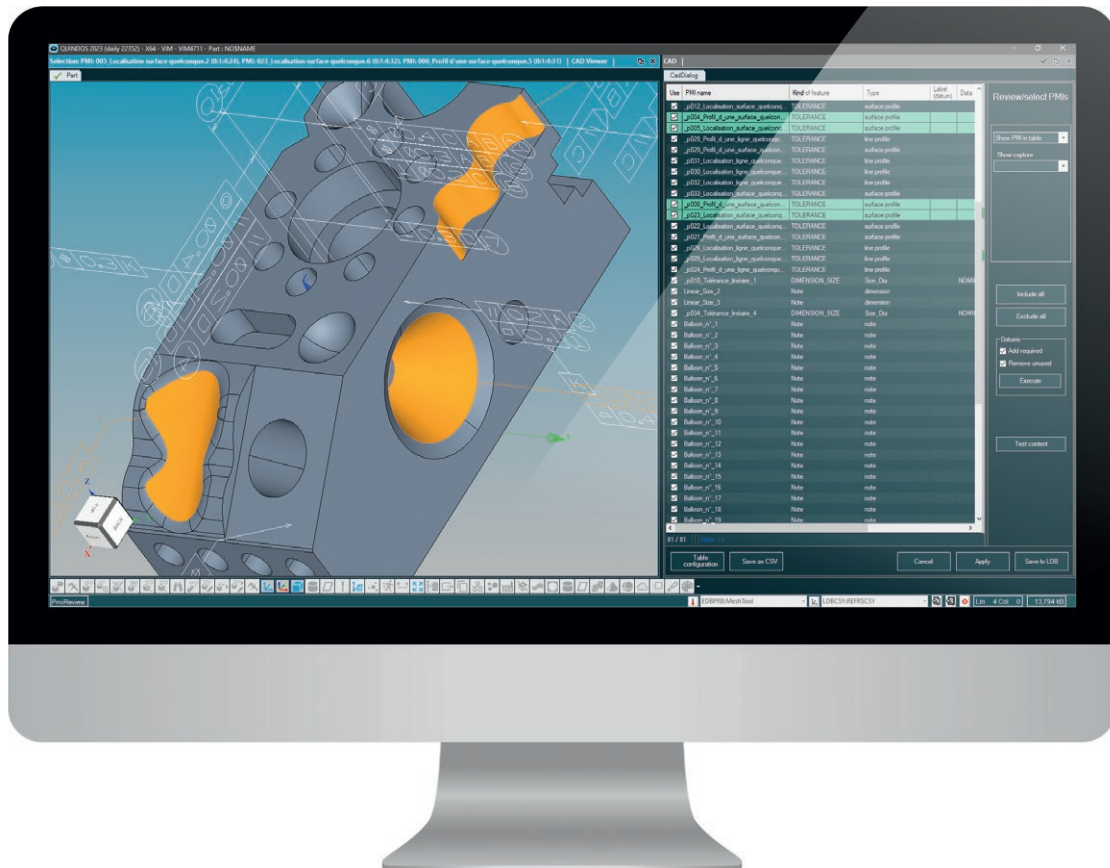
Extend and expand with dedicated modules for precision gears for gearboxes, gear pumps and other power transmission components



- **Operator guidance** from parameter input to part adaptation on the measuring device
- **Developed with industry partners** for widest possible solution support
- **Reverse Engineering** features support part recreation from original artifact
- **Automated generation** of measurement routines for complex parts
- **Connect to statistical reporting packages** for monitoring and evaluation
- **GDE (Gear Data Exchange)** interface - transfer and distribute gear data electronically
- **Modules comply** with international standards and industry guidelines
- **Combine part programmes** to build up complex routines
- **Measure on pallets** and across a variety of part positions for increased throughput

# QUINDOS Solution specific modules

Develop and expand your application with an unrivalled portfolio of add-on features for complex evaluations



## 2D & 3D curves handling

- Comprehensive algorithms for best fit and radius correction
- Advanced point handling
- Advanced CAD based functionalities

## Feature oriented inspection

- Flexible adaptation of inspection plans to requirements

## Statistical monitoring

- QUINDOS statistics
- Q-DAS interface
- Connect to HxGN Metrology Reporting

## Automate Inspection Planning with PMIs

- One-click of feature measurement for parts with PMI data
- Repair incorrect or incomplete PMI data for MBD readiness

## Mesh & Point cloud inspection

- Use given inspection plans for the digitized part
- Measure and evaluate special geometries according to standards

## CMM monitoring and acceptance test

- Test the accuracy of the measuring device to ensure compliance with standards



## CAD capabilities

A fully integrated CAD core (which includes support for IGES and STEP) allows the 3D representation of all part geometries in combination with moving path planning, stylus configuration, measured points, calculated elements and coordinate systems. Part parameters can also be used to generate accurate 3D models.

Use QUINDOS CAD Converter to utilise information embedded within native CAD formats such as Parasolid, SolidWorks, SolidEdge, JT, STEP 242, CATIA, Siemens NX and Creo.

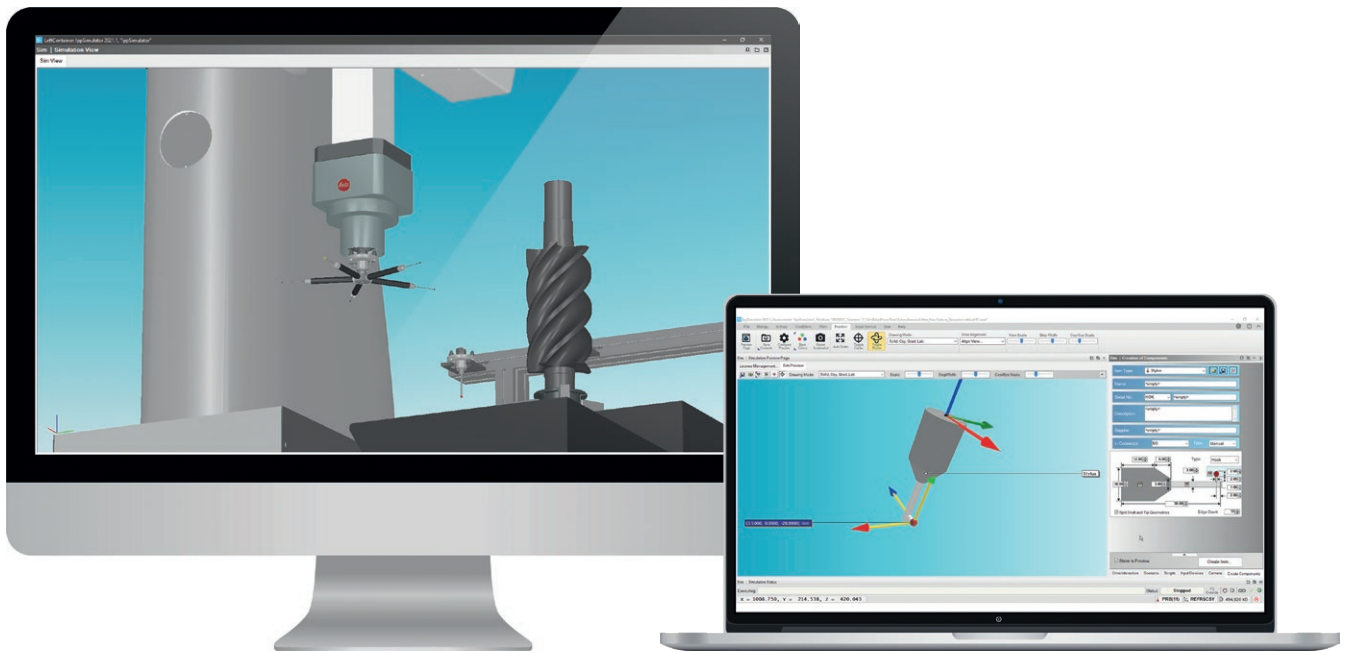
# Offline programming with the digital twin

I++ Simulator enables you to simulate QUINDOS measurement programs and test new applications, with complete visualisation of the coordinate measuring machine (CMM), sensors, fixtures, parts, loading systems, and more.

The digital part is measured virtually. A comparison with the CAD model or the conventional nominal data provided in your analysis software gives real results including deviations.

Inspection plans created, optimized and tested offline with the I++ Simulator are directly transferable and executable to your measuring device.

- Optimise quality and drive measurement productivity
- Reduce machine downtime
- Ensure machine accuracy by avoiding collisions
- Risk-free training tool for internal knowledge transfer



- Detailed **collision check** and **path monitoring**
- **Extensive components libraries** (sensors, connectors, tool changers, rotary tables etc.)
- **Fast startup** for maximum productivity
- **Choose from a wide range of machines** (Hexagon Metrology, Wenzel, Zeiss, etc.)
- **Customisable environment** components create a detailed simulation of part and machine
- **I++ DME standard** - I++ Simulator is based on the independent I++ DME interface
- **Comprehensive tool tip libraries** (Hexagon Metrology, Renishaw, Zeiss)
- **Simple Import** of parts, fixtures, tools, etc. in CAD format
- **Zoom and camera** functions for close inspection



## Supporting you every step of the way

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.

Hexagon's metrology experts are equipped with extensive experience of QUINDOS and can provide additional offline programming through to tailored measuring system solutions.

Access the latest software functions, user know-how and targeted software support. Continuous software updates are all included.

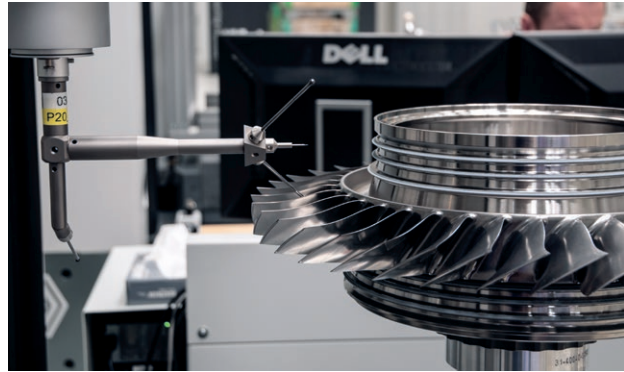
Hexagon's global presence extends to over 70 Solutions Centres globally. Our service and support network is strategically placed to ensure you have access to responsive technical assistance and experience minimal disruption to your operations.



# QUINDOS in action

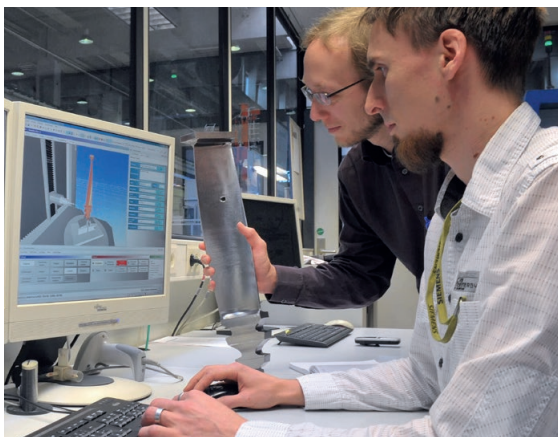
## MTU Aero Engines - Munich

MTU Aero Engines develops, produces, sells and maintains civil and military engines for airplanes and helicopters, as well as industrial gas turbines. They use QUINDOS software with I++ Simulator alongside a high-precision Leitz PMM-C to measure a wide range of components.



**“ Our basic philosophy is to have very stable production processes. To achieve that, we need metrology which we can use to check the blisks as efficiently as possible; short measuring times, reduced measurement uncertainty, process stability and evidence of test instrument capability”**

**Stefan Hertling,**  
Director Quality Inspection Production at MTU



## Siemens AG Steam Turbines - Görlitz, Germany

Siemens produce bespoke industrial steam and gas turbines for electricity production and as mechanical drives for compressors, blowers and pumps. Siemens rely on QUINDOS and I++ Simulator to visualise production and measurement of blades without tying up the CMM.

**“ We can also measure the results of the production simulation virtually with I++ Simulator. This not only identifies collisions, but allows the programmed dimensions to be measured and checked as well.”**

**Sebastian Frinker**  
Applications engineer, Siemens

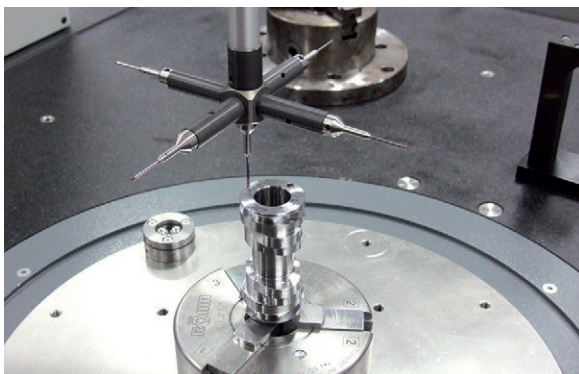
## Fette GmbH

Fette tablet presses are used worldwide in the pharmaceutical and related industries. The components of the tableting machines have to be manufactured to high accuracies so that tablet pressing can be as precise as possible. Fette measures tablet press components automatically using QUINDOS with a Leitz PMM-F CMM and a pallet system to increase productivity.



**“ It was important to me that our employees would only have to learn one system and no additional control and handling systems. Therefore we chose to use QUINDOS as our primary system.”**

**Mangnus Schumacher,**  
Mechanical Engineering Quality Assurance Manager at Fette GmbH.



## Audi Hungaria Motor Kft.

QUINDOS tests the accuracy of power train components for one of the largest engine plants in the world. Almost 400 engine varieties are produced at Audi Hungaria Motor in Győr, spanning from engine blocks and cylinder heads to piston rods through to crankshafts and camshafts.

**“ We can use QUINDOS as an overlapping software on all different kinds of measuring machines. This enables us to better compare results and simplify the programming efforts and management of the measurement programmes”**

**Kohán Zoltán,**  
Audi Hungaria Motor Kft.



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.

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