QUINDOS

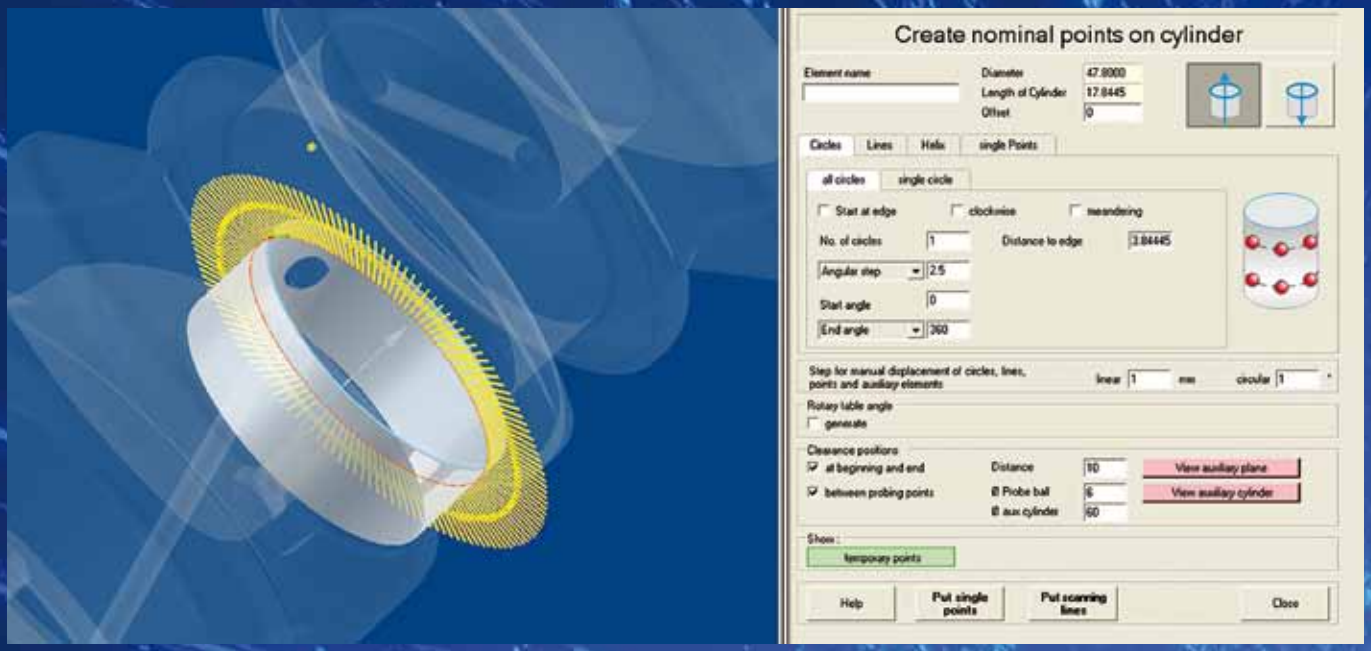
QUINDOS 7

Software for Coordinate and Form Measuring Machines

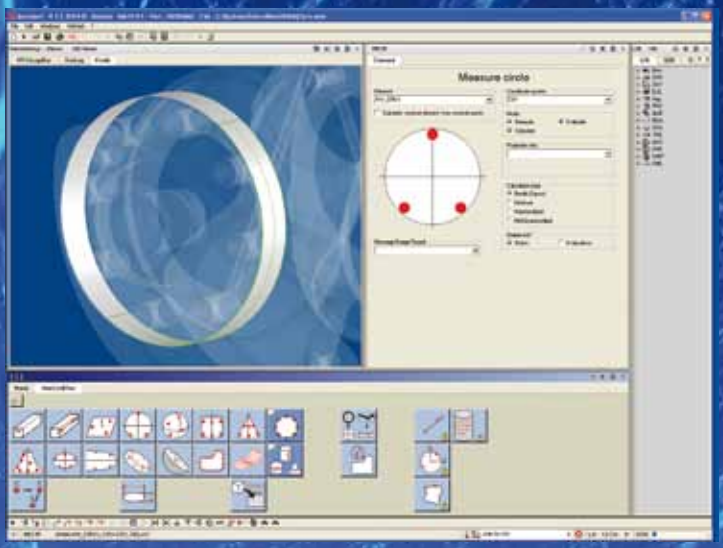
The PowerTrain Analysis Tool

www.QUINDOS.de

HEXAGON METROLOGY



QUINDOS: Continuity as tradition



Everything under control

QUINDOS is known in the industry as the software which was upwards-compatible from day one. Users appreciate the economic benefits of migrating from one version to the next in one day.

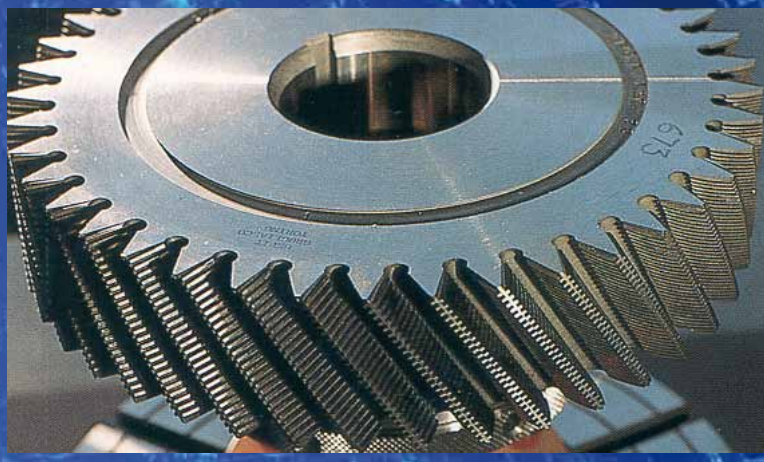
In comparison with previous versions, QUINDOS 7 has a completely new user interface with enhanced access to all of the information pertaining to the current environment. In spite of this, existing users will feel at home right away, thanks to proven QUINDOS components being carried over and improved. It goes without saying that each and every existing program can be used "as-is" in the latest version.

The consequent handling of regular geometries, free-form surfaces and special geometries all on the same machine (CMM or form tester) make for easy access to a wide range of tasks.

As a consequence, QUINDOS is the reference software for special geometries such as gears, gear cutting tools, step gears, etc.

The database system ensures that even large programs can be processed quickly and the results can be accessed directly, either on line or later.

The programming of functions, which on other systems can only be executed interactively is a QUINDOS trademark. The user interface can also be customised to suit the process. User instructions (messages, images, sounds etc.) can be integrated into programs. Programs can also be selected and started using images.



Shaver for gear finishing

The new printing features allow reporting on all printers with Windows drivers. It is now possible to integrate image files into reports as well as formatting reports in Bitmap or JPEG for downloading to the Internet.

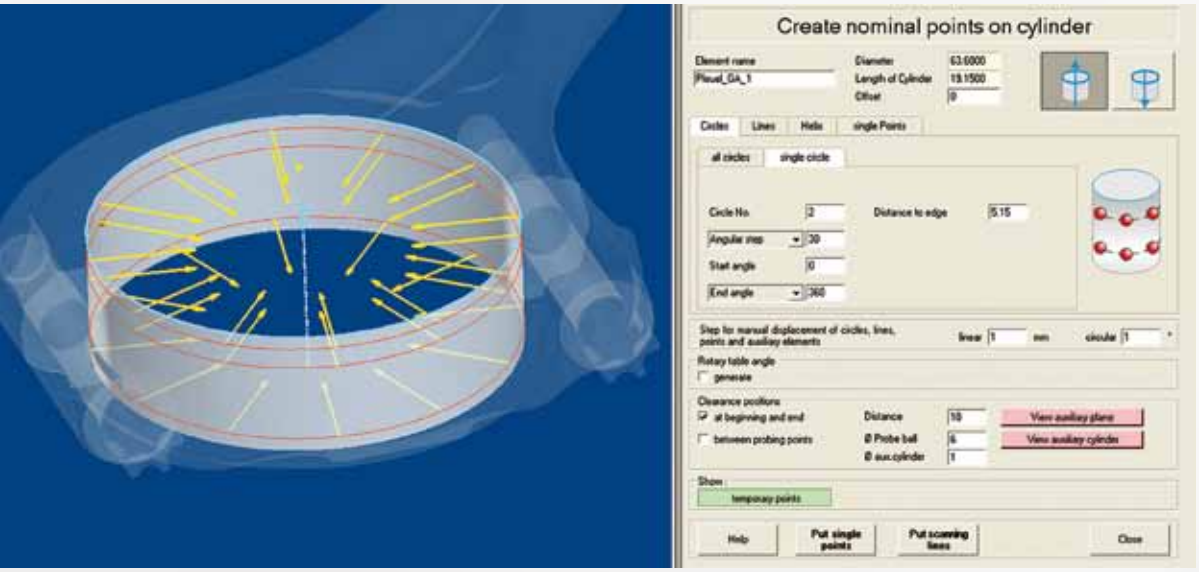
The modern help documentation utilizes images and graphics and cross-referencing to other relevant information. The help documentation can be called up directly from QUINDOS.

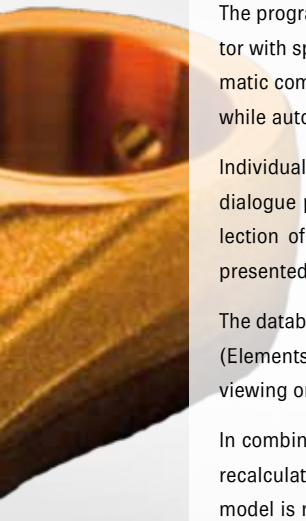
Apart from the obvious changes in the user interface, QUINDOS 7 now supports the latest standards, such as I++DME for controlling the CMM/form tester and XML for data exchange.

QUINDOS 7 with a CAD core

The fully integrated CAD core allows the 3D reprasentation of all part geometries in combination with moving path information, measured points, calculated elements and coordinate systems. The option CAD Basis can be used to import 3D CAD models by means of which points can be generated, displayed and evaluated.

Graphical User Interface:
New but still familiar





The mass of information makes a good user interface compulsory. The partitioning, as well as the size, of the graphical interface is freely selectable. Customised layouts can be saved as snapshots for use at a later date.

The program text appears in a modern, multi-colour text editor with spell checker and drag-and-drop functionality. Automatic completion helps to find the correct command syntax, while automatic insert helps to complete a line of code.

Individual commands can be modified using customized dialogue pages. Depending on the current command, a selection of icons appropriate to the next command will be presented.

The database browser can be used to access all object types (Elements, coordinate systems, procedures, probes etc.) for viewing or editing.

In combination with a machine, every point taken is used to recalculate the element and refresh the deviations. If a CAD model is not available, the element surface is created using the measured points.

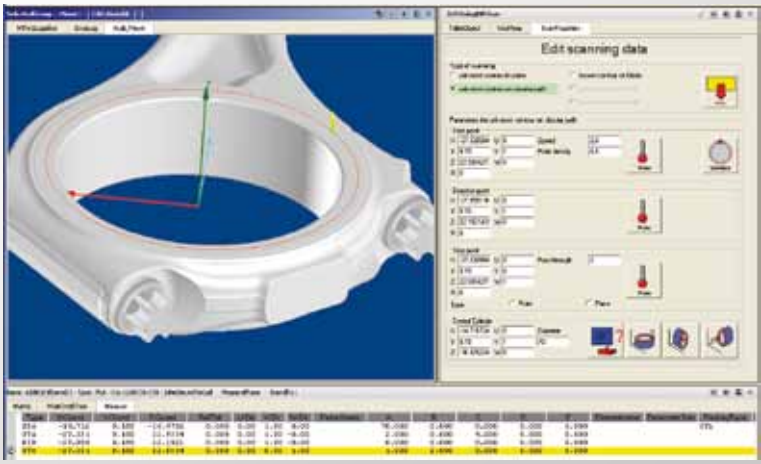
For advanced programming, the experienced user can use the **Dialog Editor** to create customized input dialogs, utilizing photos and graphics (a special **SVG Editor** is integrated into QUINDOS for this purpose).

Point patterns with the correct normals can be generated on curves and surfaces. Measured points can also be represented at any time, independent of the program currently running.

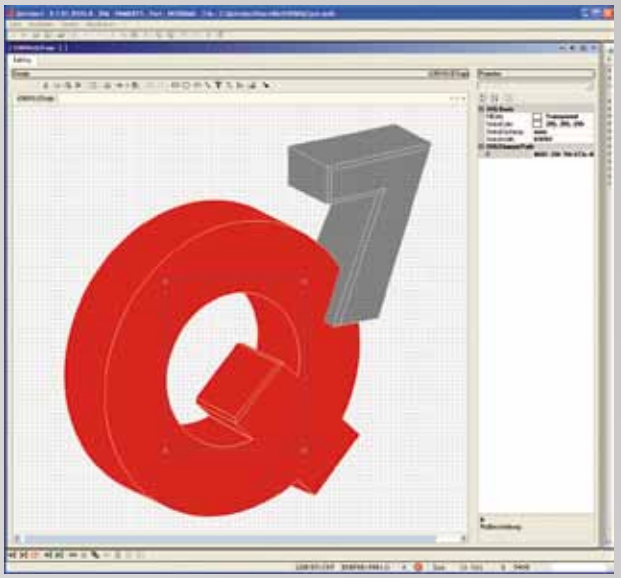
Every geometric element is assigned a surface so that selection is made easier (eg. for creating connections).

Every coordinate system can be selected and displayed.

Error handling has always been a QUINDOS strength. This has now been improved using error lists and error helps for more transparency.

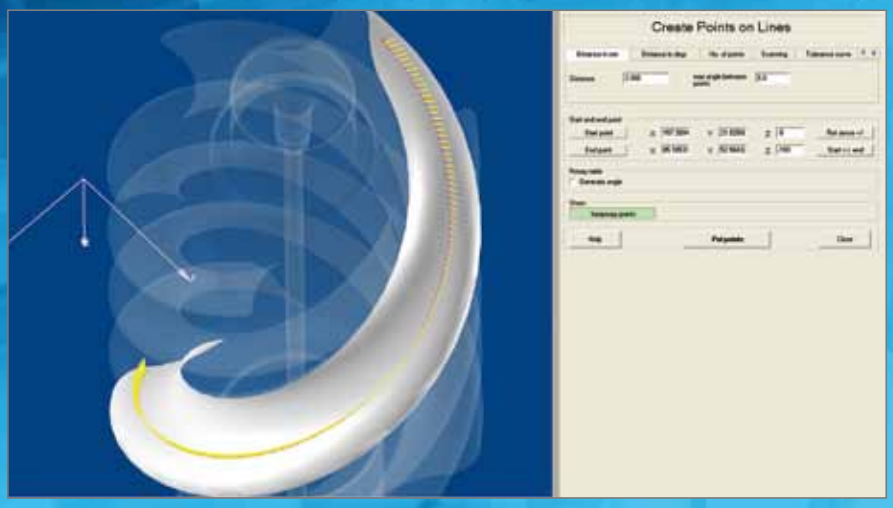


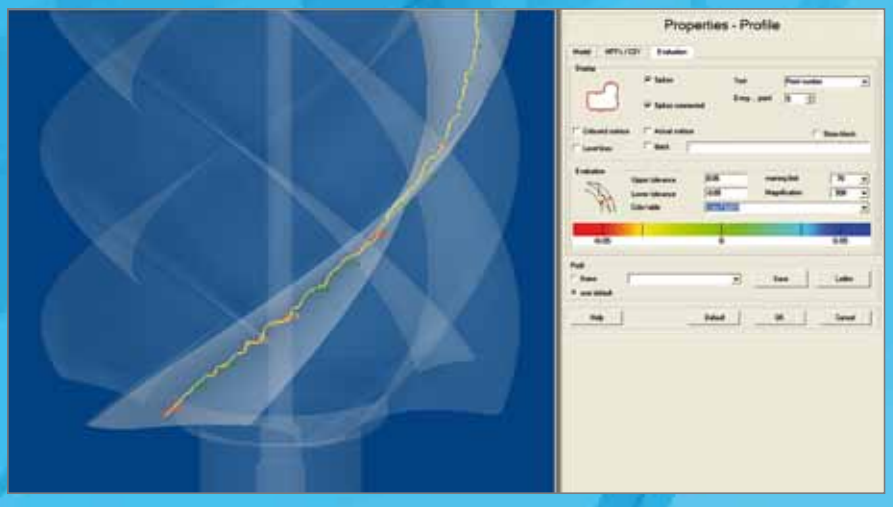
Generating scan lines on a CAD model

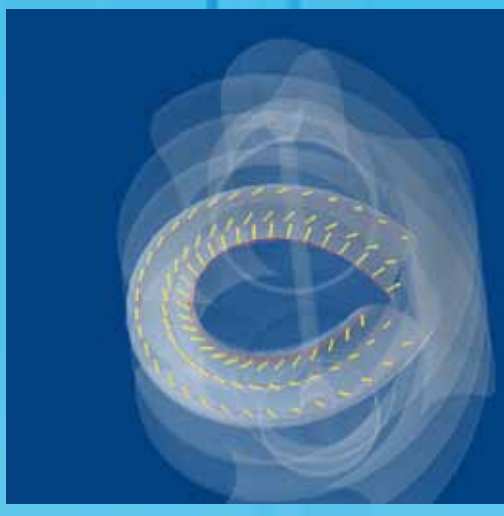


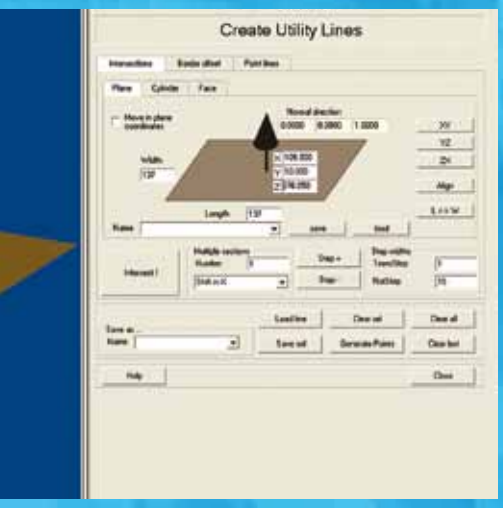
Scaleable Vector Graphics (SVG) editor

Process planning using the CAD model: Intelligent methods for improved economics

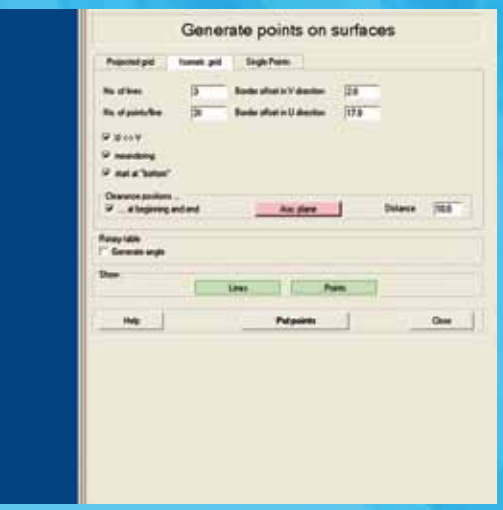








Creating section lines



Generating points on surfaces

The most noticeable new feature of QUINDOS 7 is the CAD core. The part geometry can be represented and manipulated (zoom, rotate, pan) in 3D. This functionality is available not only for CAD models but also in the more traditional teach-in mode. Point patterns can be generated interactively and measured points can be represented with their corresponding deviations and the calculated element.

The QUINDOS basic program can be used to represent nominal and actual points on the calculated surface.

The option CAD Basis makes it possible to generate moving path information for geometrical elements. Every geometric element is assigned to a group of surfaces which in turn can be used to make selections for further analysis (eg. connections). IGES, STEP, Catia V4/V5, Unigraphics NX and Pro-E model formats are currently supported.

The option CAD Surfaces can be used to generate points with the correct normals on curves and surfaces using grids or section lines (utilizing planes, cylinders, edge offsets etc.). Measured points can also be represented at any time, independent of the program currently running.

Every coordinate system in the program can be selected and displayed.

Measurement analysis and evaluation: According to different requirements

From day one, QUINDOS was developed for use on precision measuring machines with scanning functionalities and the mathematical algorithms are implemented accordingly. There are various types of calculation methods which can be applied to convert measured points into elements. (eg. inscribed, exscribed, least squares etc.) Furthermore, individual element parameters can be fixed and the resulting element calculated accordingly. Besides the standard geometrical elements, Ellipse, ellipsoid, parabola and paraboloide algorithms are also implemented.

For form testing with either dedicated form testers or scanning CMMs, points can be filtered using either high or low pass filters or Fourier analysis. All of the information pertaining to the feature is stored in a transparent database system for further analysis.

Logical decisions can be made which can control the further analysis of the measuring results automatically.

The 3D interactive analysis and evaluation of the measured points can be used to appraise geometrical surfaces, freeform surfaces and curves with or without the associated CAD model.

Presentation of the results

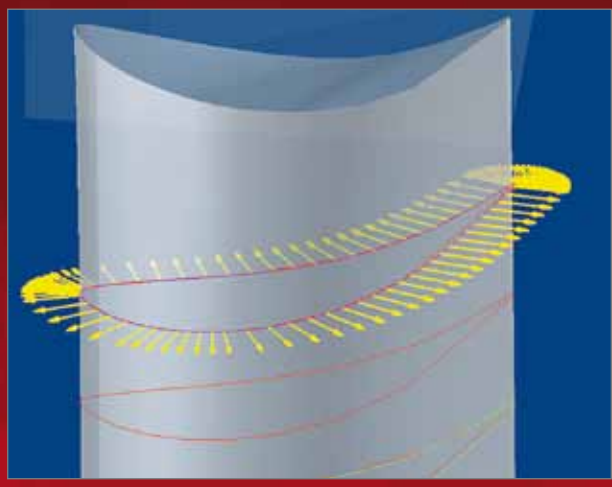
In the industry, there are differing requirements for the format and archiving of results. Both the PageViewer and the ReportViewer create a paged file in document format (.GIF, .JPG, .BMP, .PDF) which can be printed on any windows printer.

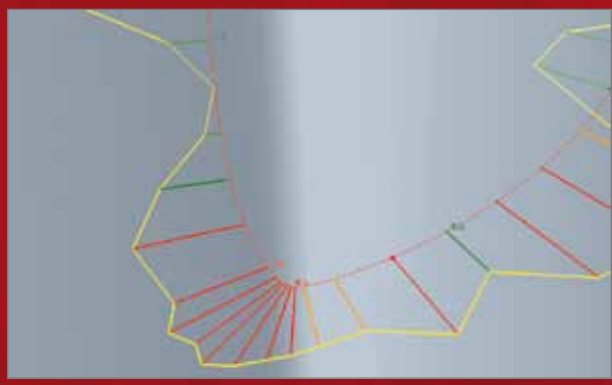
PageDesigner

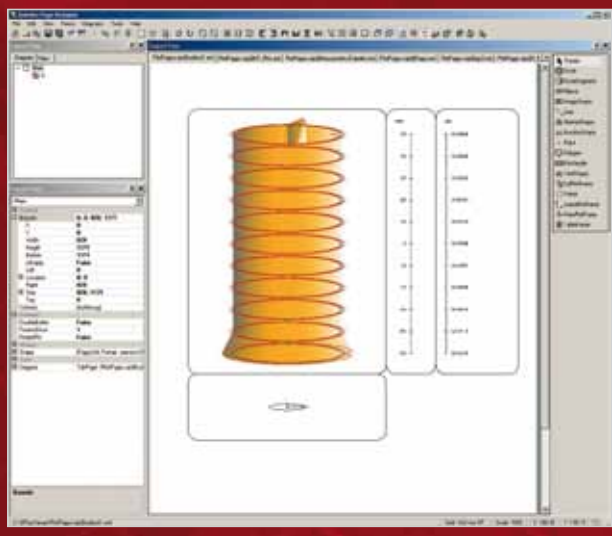
The PageDesigner can be used to create customized report formats, eg. for different component types.

Multi-page layouts, utilising graphics, texts and tables can be integrated in a single document which can be viewed on line.

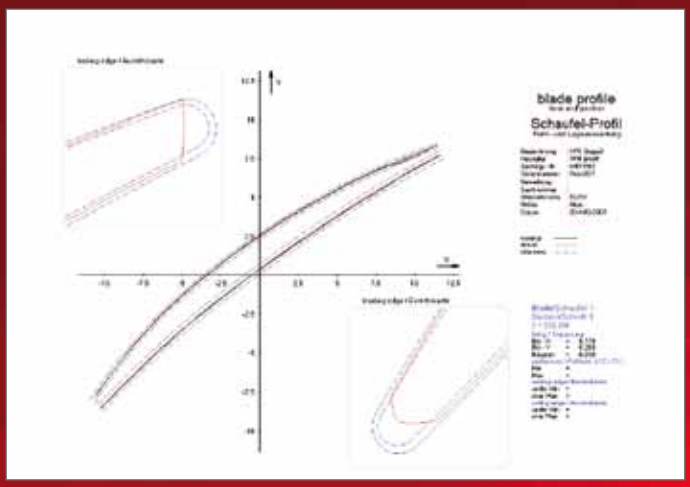
The report format is independent of the report contents. Different formats can be used to format the report contents for different recipients.



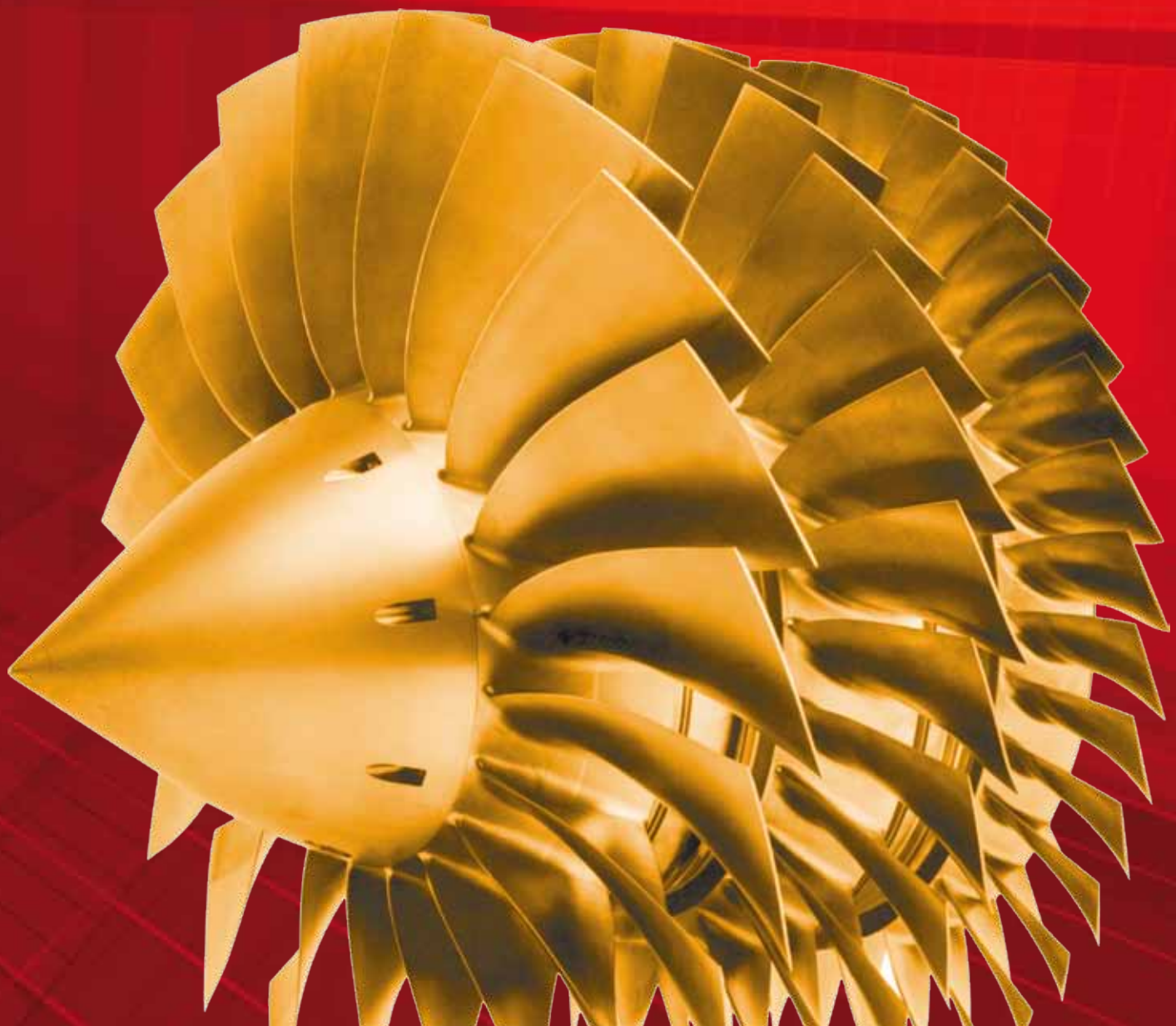


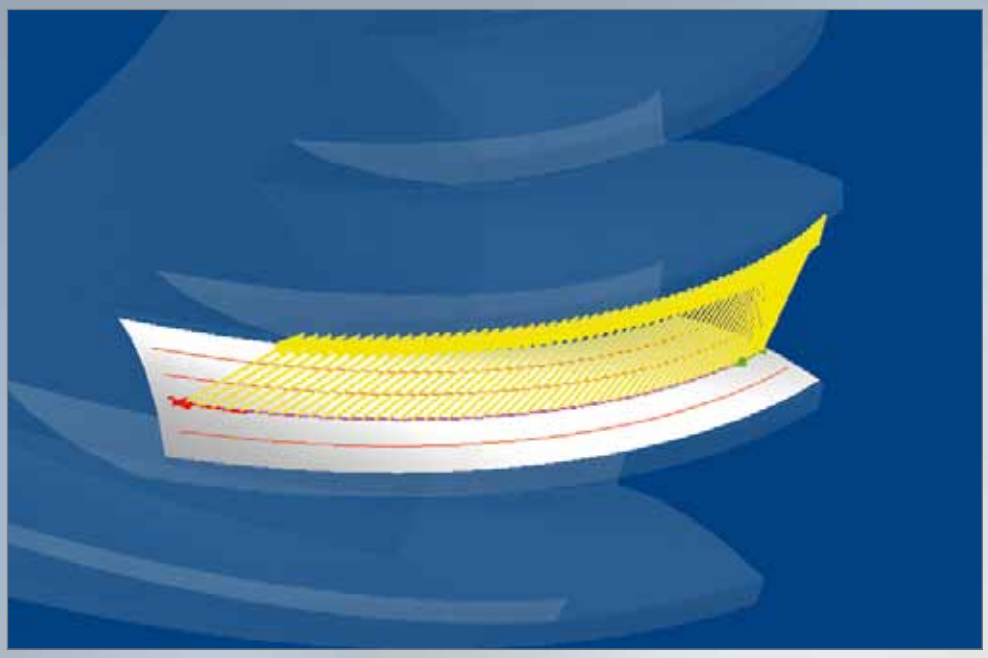


PageDesigner: customized graphical reporting

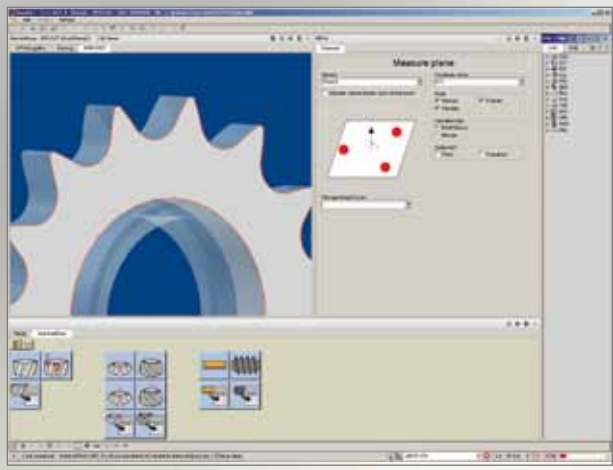


Blade evaluations (typical example)





Modular upgrading: Unbeatable for gears and other special geometries



No other software is stronger in the field of special geometries than QUINDOS. There are multiple options available, all dedicated to the measurement of gears (straight gears, bevel gears, serrated gears, unknown gears, gear normals etc.), gear cutters (hobs, broaches etc.) and worm gears (worms, cylindrical worms etc.). QUINDOS is also at the leading edge when it comes to other special geometries, such as screw compressors, blades, etc.

The part parameters and the inspection plan are used to generate the moving path information and measure the part fully automatically. Parts can be measured with or without a rotary table.

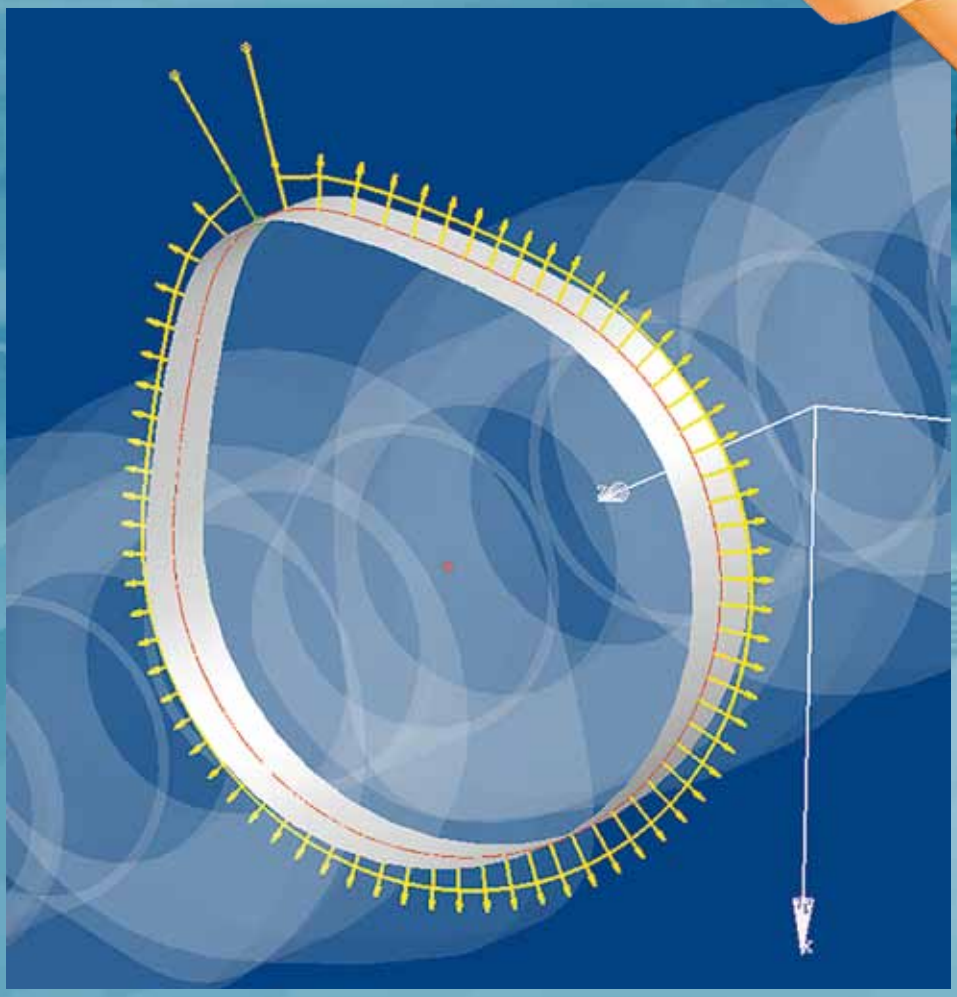
The measurement and evaluation of all special geometries conforms to the appropriate national and international standards.

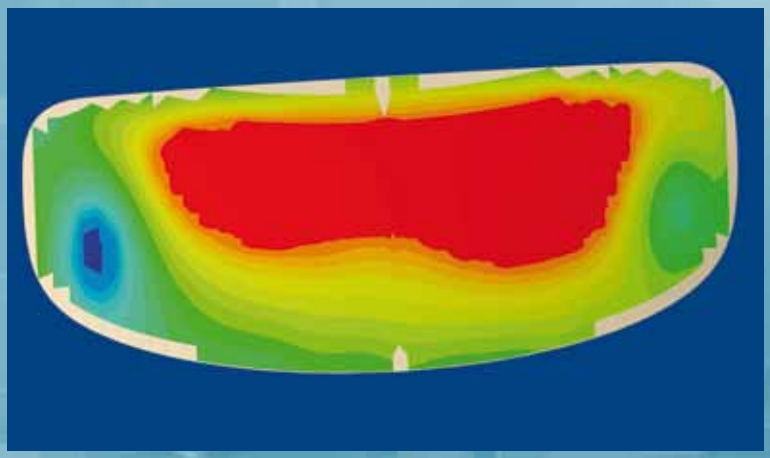
Dialog: tool allocation

Typical gears and gear cutters

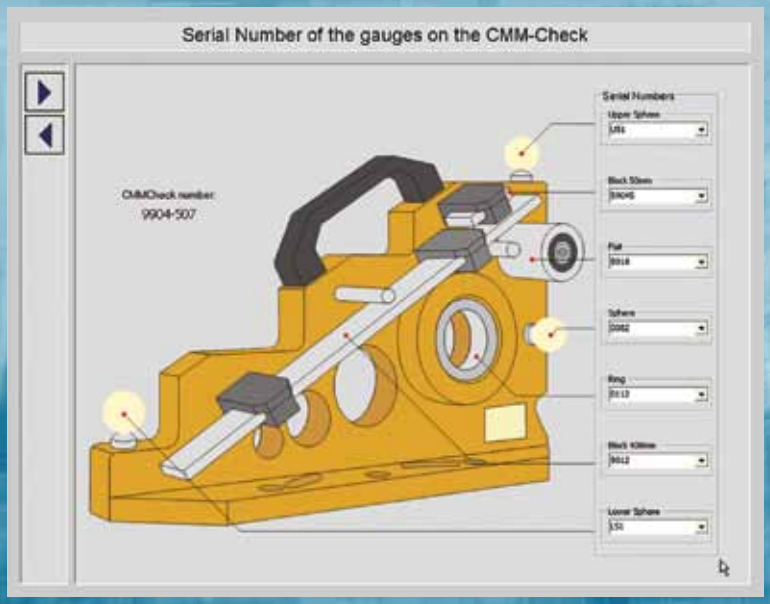
Gears
Gears (cylindrical, straight/helical, internal/external, serration)
Unknown Gears („Reverse Engineering")
Gear Gages
Straight Bevel Gears
Spiral Bevel Gears
Sprockets
Serration Gears
Customer-specific Gear Evaluations
Curvic Couplings
Gear Cutting Tools
Hob Cutter
Broaches
Shaper Cutters
Shaving Gear
Form Cutters (Customer-specific)
Worms
Worm Wheels for Cylindrical Worms
Cylindrical Worms
Globoid Worms
Miscellaneous
Screw Compressors
Camshafts
Step Gears
Threads (ISO and API)
Blades
Complementary Cams
Valve Seats and Guides
Ovality of Pistons
Constant Velocity Joint

Modular upgrading:
For every task the right solution





Deviation representation on the CAD model



CMM check dialog

Parallel to the special geometries, QUINDOS also has a comprehensive array of specialised options, covering a wide spectrum of applications. The new CAD packages and interfaces provide quick and easy programming based on existing data.

CAD Options

- CAD-Basic
- CAD-Surfaces
- CAD-Import CATIA V4
- CAD-Import CATIA V5
- CAD-Import Unigraphics
- CAD-Import Pro/Engineer

Miscellaneous QUINDOS Options

- Curves
- 2D-Gauging and Constant Velocity Joints
- Polygon
- Digitising of Surfaces
- 3D-Gauging of Points and Elements (measured points in multiple geometric elements)
- Measuring Part Pallets
- Feature-based Inspection
- Digital Input/Output Interface
- Automatic Gauge Inspection
- Automatic Calculation of Tolerances for Gauge Inspection
- Connecting Rods
- Relational Database Interface (SQL, Oracle)
- Centering of Balls
- Compare Part Programs
- FUBIT Interface

Statistic Package

- Statistics (interactive real time)
- Statistic Feature Overview
- STATviewer

CMM Check and Acceptance Programs

- CMM-Check
- CMM Test with Ball Plate
- ISO 10360 (-2, -3, -4, -5) with Step Gauges and Gauge Blocks
- Offline CMM Probing Error Simulation

Your choice of machine: With I++DME into the future

QUINDOS 7 has its sights set on the future: I++DME is an integral part of every installation. Every CMM which supports this interface is compatible with QUINDOS 7. As a result, machines from different manufacturers can utilise the same software and produce the same, comparable, results.

Users can now select the most appropriate software for the measurement in question, whether it be body in white or more demanding geometries.

Because this interface is only available on new machines, QUINDOS 7 drivers are available for existing CMMs and form testers e.g. from Mahr, Hommel or Adcole.

QUINDOS 7 has routines for qualifying all of the various probing systems and probe changers.

I++DME

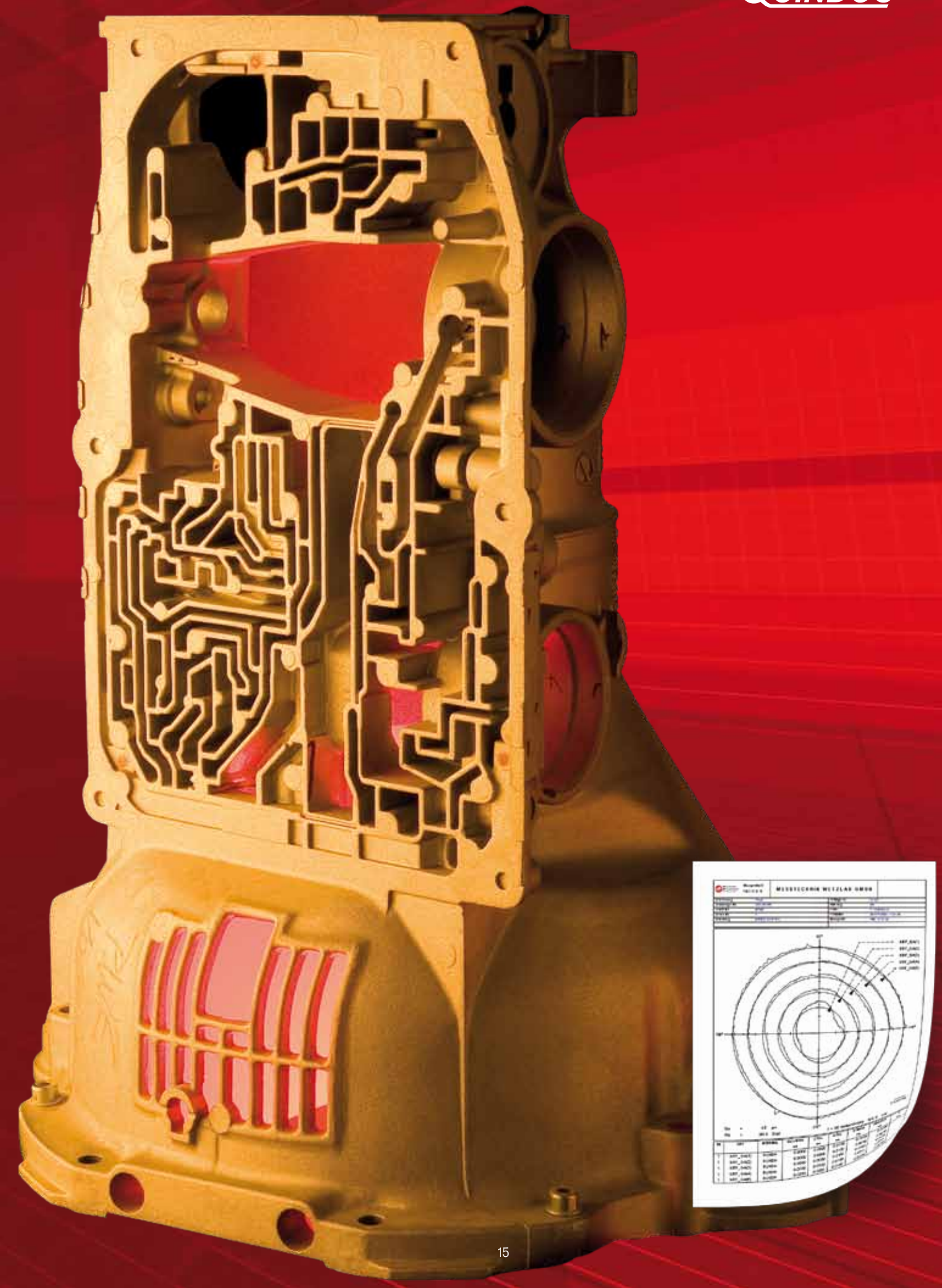
An automobile industry working group has been working on standardising interfaces in the CMM industry since 1999.

The most wide-reaching result of it's work is the I++DME (Dimensional Measuring Equipment) interface, a universal standard for CMMs, form testers and other length measuring instruments.

Simplifying the data exchange between CAD systems and measurement strategies is one of the next goals of the working group.

Messtechnik Wetzlar is an integral part of the group and has worked closely with it since it's inception. The implementation of their standards in QUINDOS is secured.

QUINDOS



QUINDOS

QUINDOS®

QUINDOS stands for „Quality Inspection of Dimensional Objects and Sizes". The measuring and analysis software is characterized by its broad range of functions and its long-term compatibility. It is especially suitable for powertrain applications within the automotive, aerospace, power generation and machine tool industry. QUINDOS is developed by Hexagon Metrology PTS GmbH. The company enjoys the reputation of being a leading provider of software and hardware solutions for quality inspection of complex powertrain mechanical components.

Hexagon Metrology

Hexagon Metrology is part of the Hexagon group and brings leading brands from the field of industrial metrology under one roof.

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www.hexagonmetrology.com

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