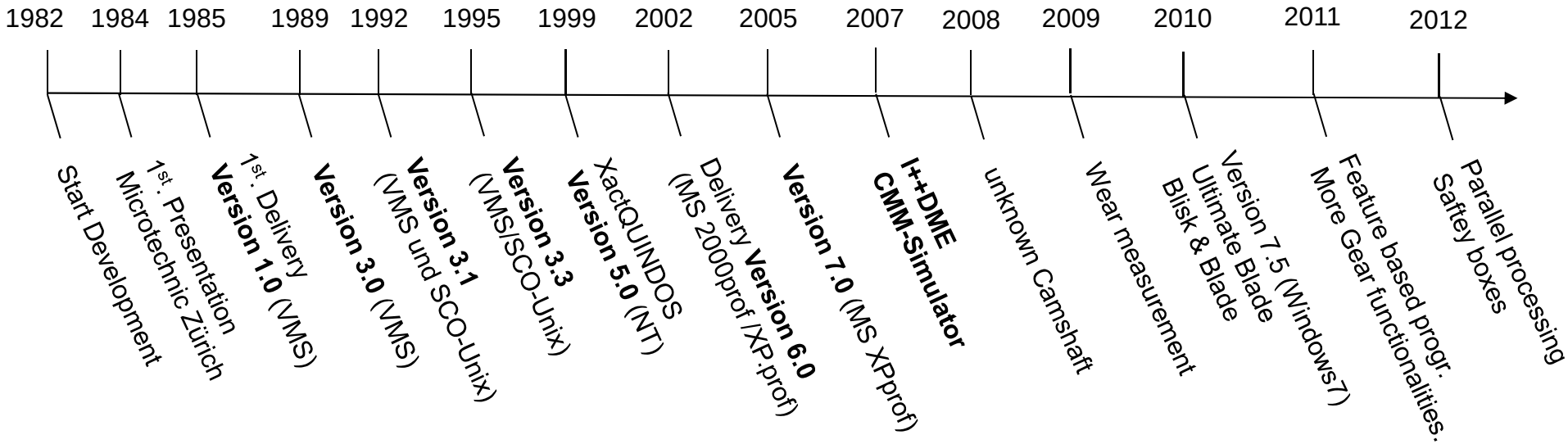
HEXAGON
METROLOGY

QUINDOS
the
Analysis tool
for Metrology

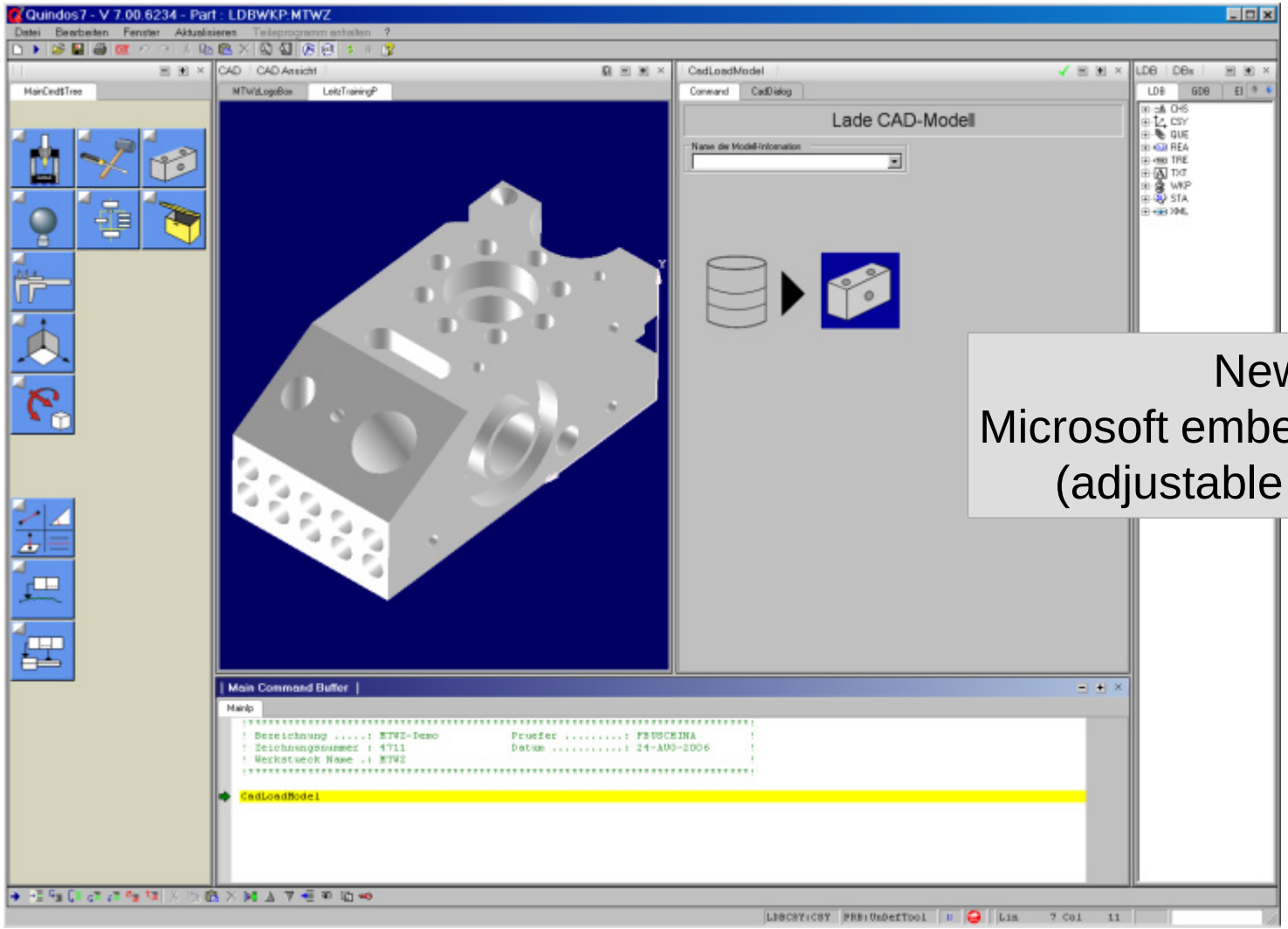
QUINDOS®

- the only upwards compatible metrology Software since 1985 (from VMS/ALPHA-VMS/SCO-UNIX/NT/WINDOWS 2000prof./ XPprof./ VISTA operating platform till Windows 7 Ultimate)

- Part programs from Version 1.0 will run on Version 7.6

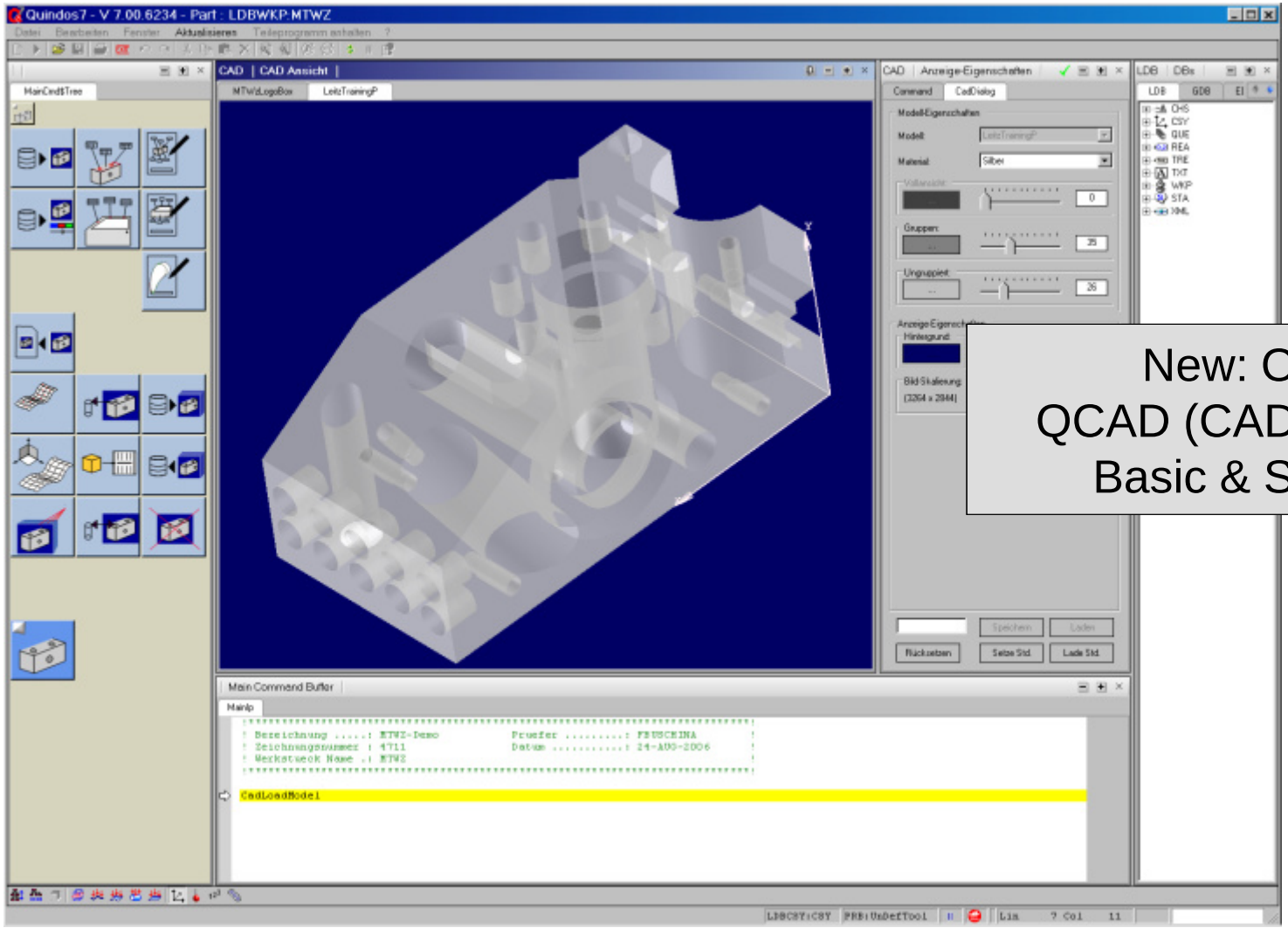


HEXAGON METROLOGY



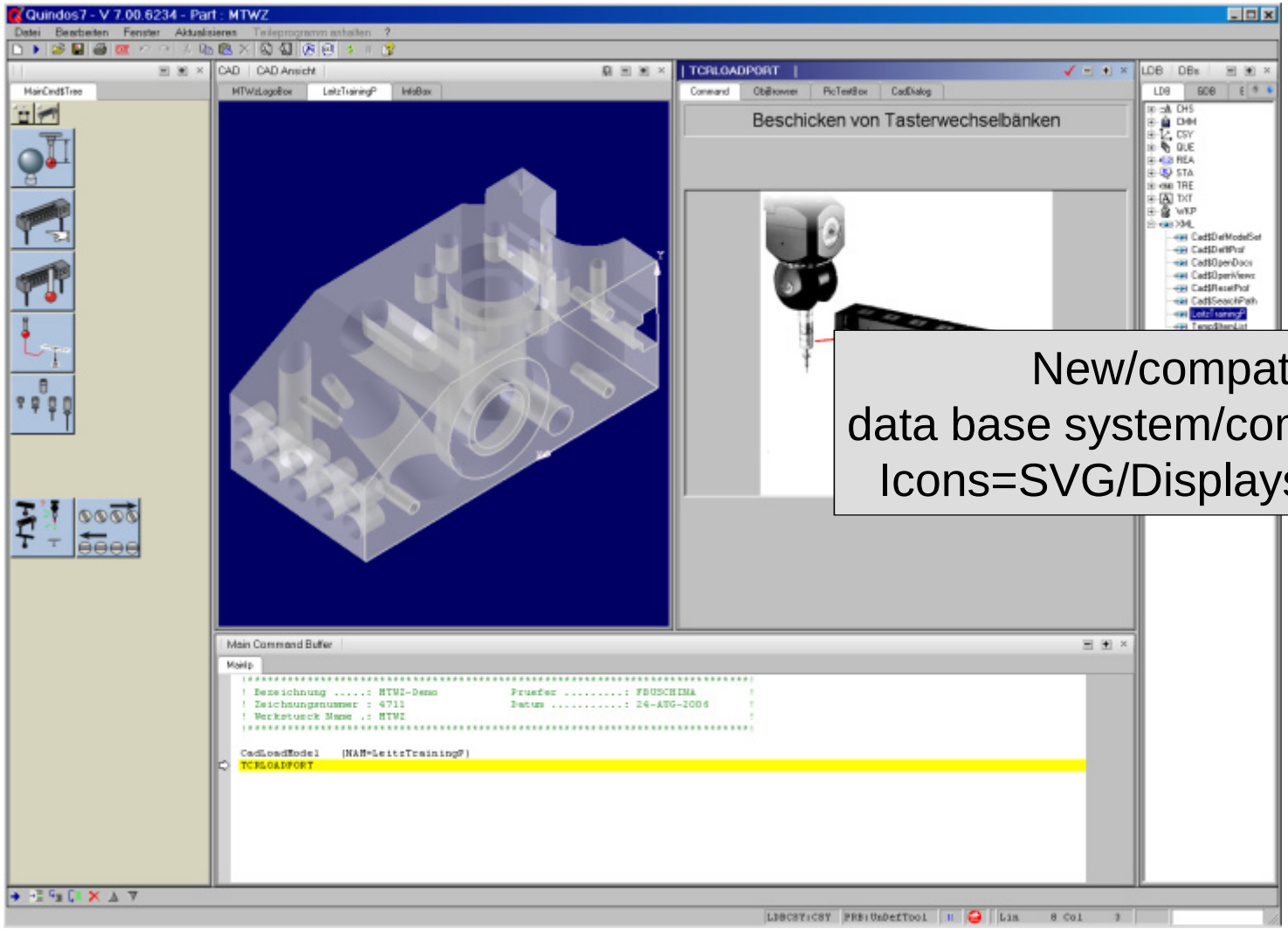
New:
Microsoft embedded surface
(adjustable windows)

HEXAGON METROLOGY



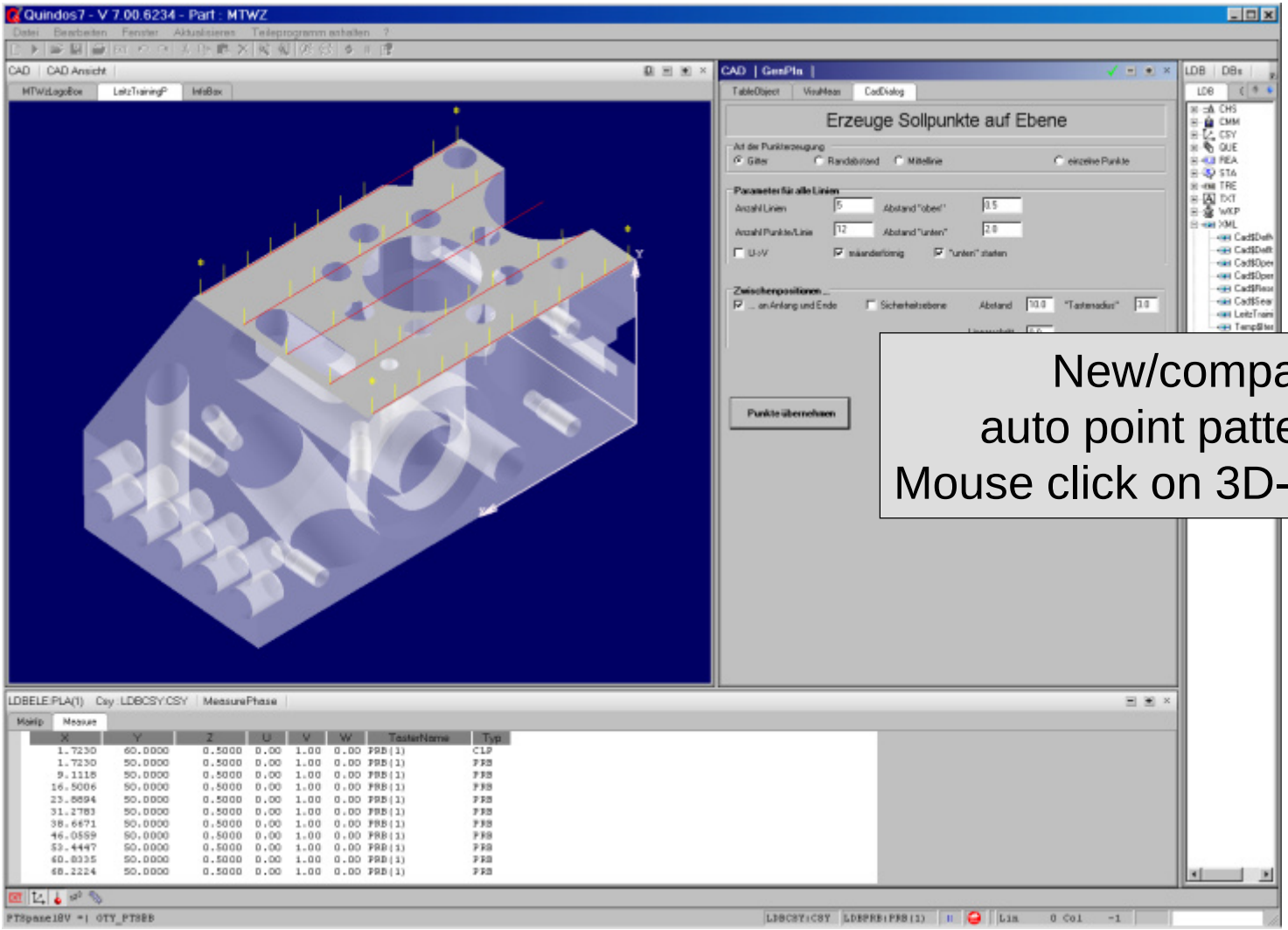
New: Option
QCAD (CAD interface)
Basic & Surfaces

HEXAGON METROLOGY



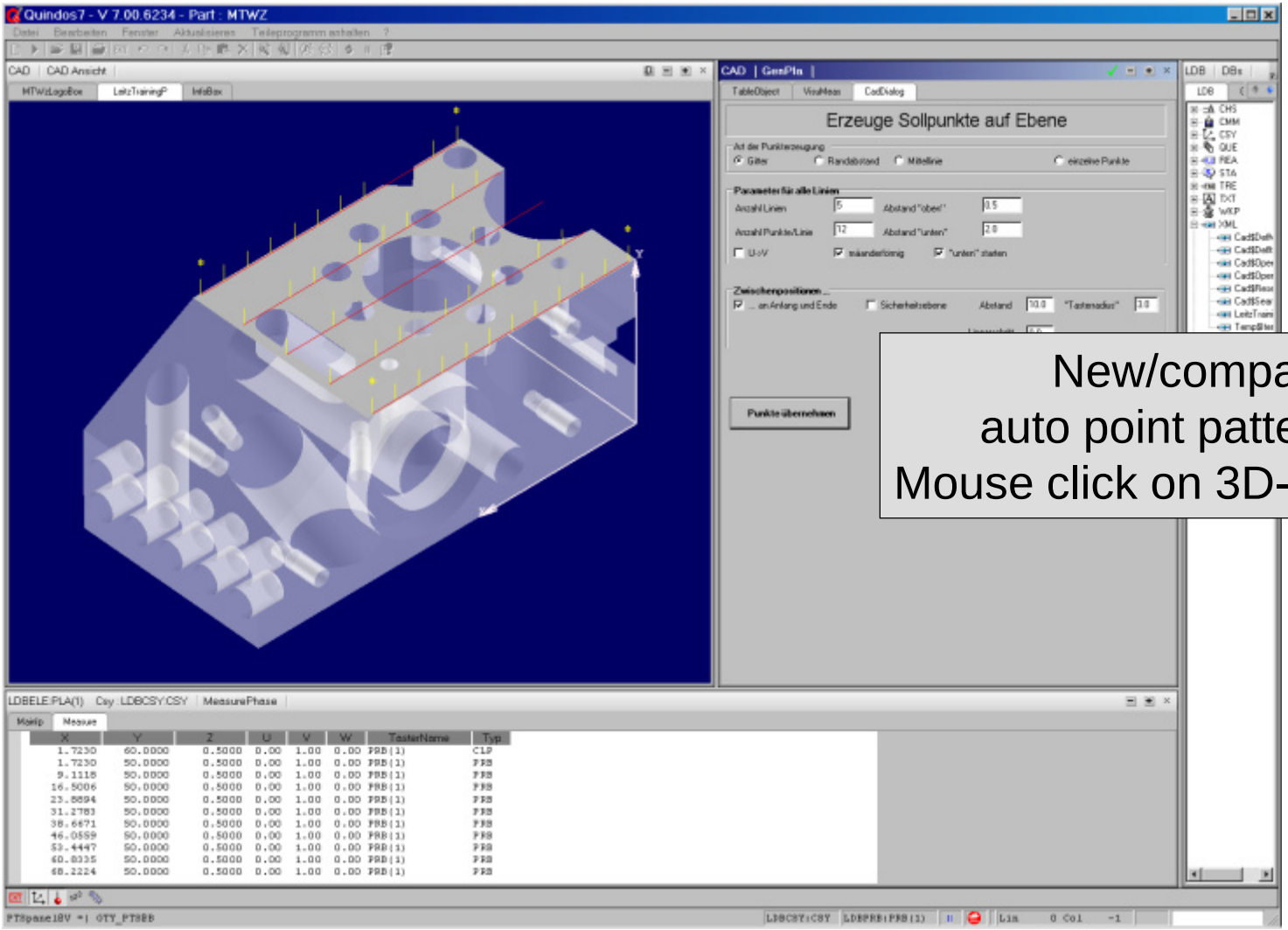
New/compatible:
data base system/command buffer/
Icons=SVG/Displays=Dialogues

HEXAGON METROLOGY



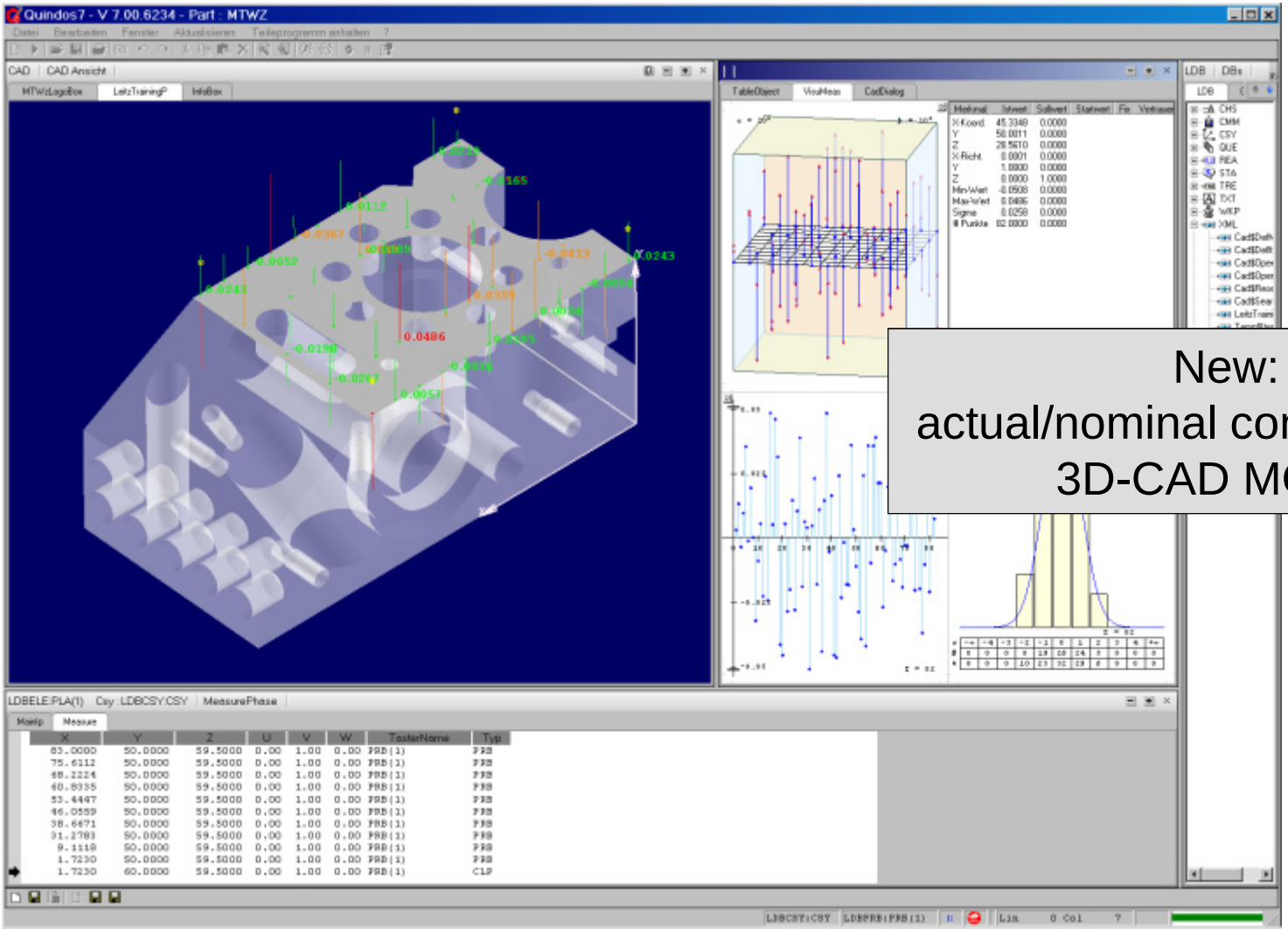
New/compatible:
auto point pattern or via
Mouse click on 3D-CAD MODEL

HEXAGON METROLOGY



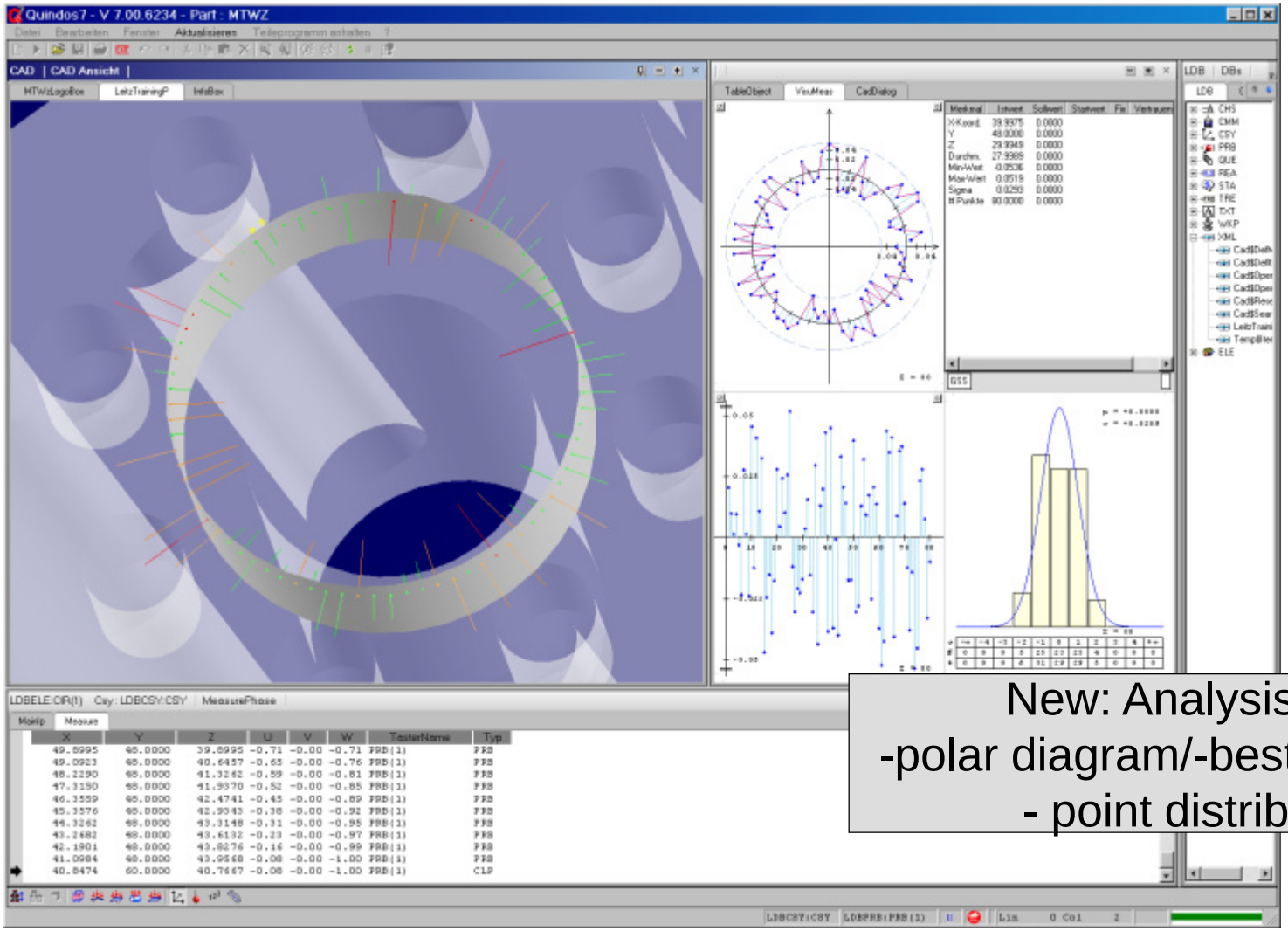
New/compatible:
auto point pattern or via
Mouse click on 3D-CAD MODEL

HEXAGON METROLOGY



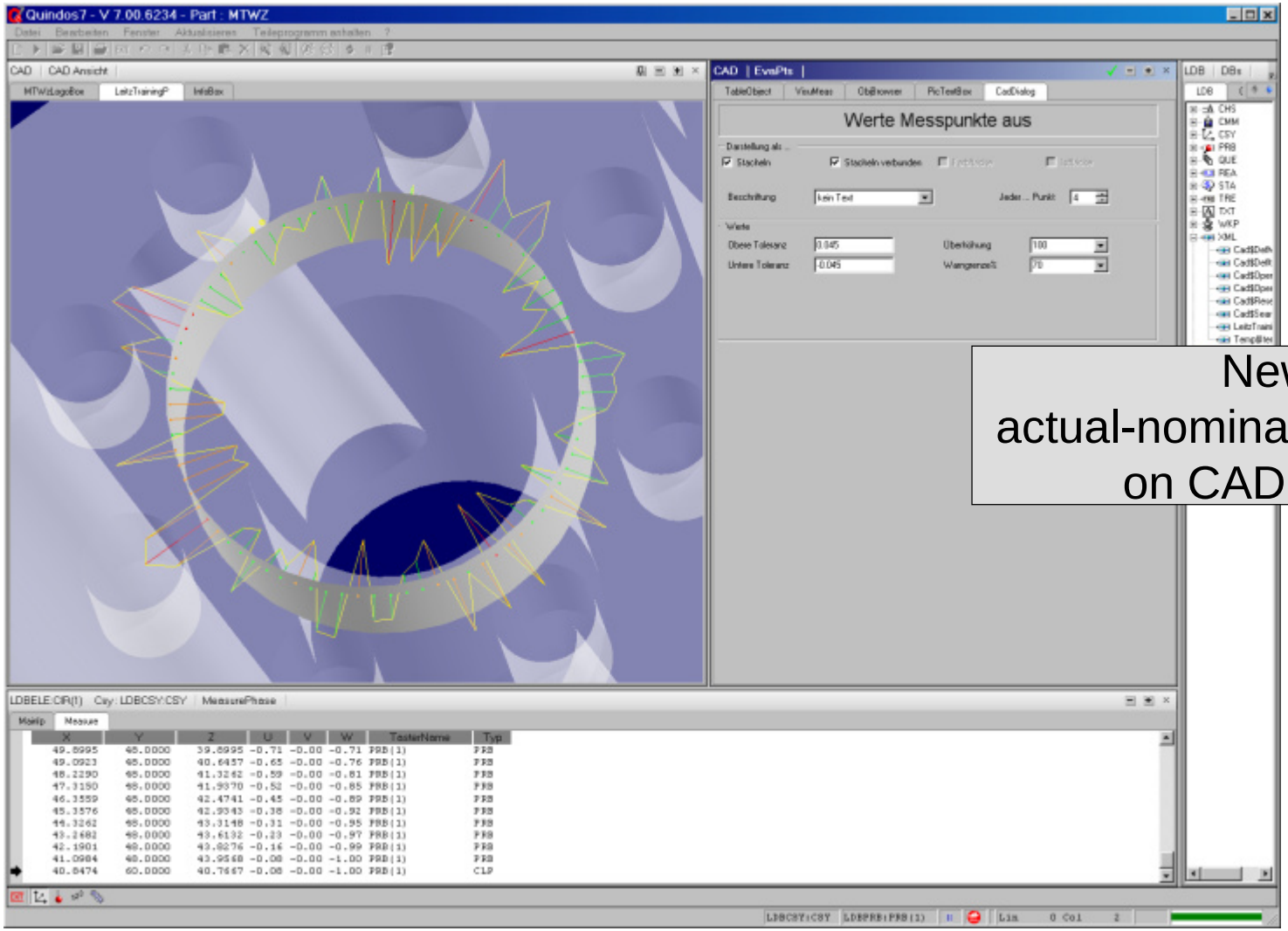
New:
actual/nominal comparison on
3D-CAD MODEL

HEXAGON METROLOGY



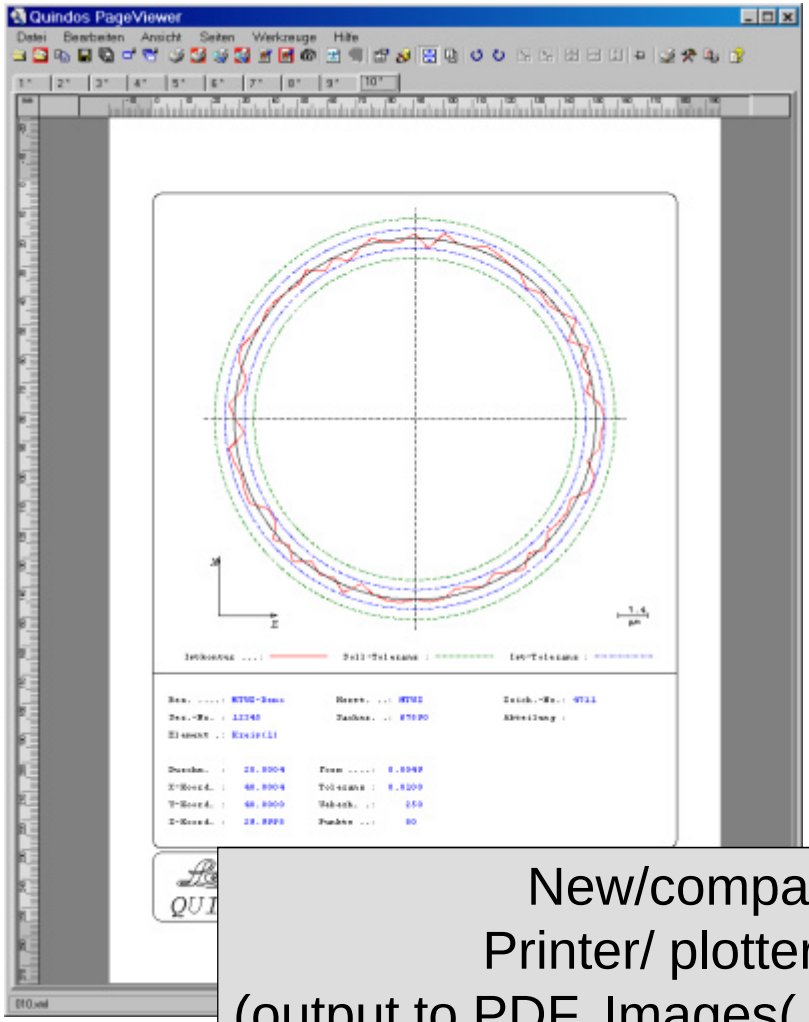
New: Analysis tools
-polar diagram/-best fitted points
- point distribution

HEXAGON METROLOGY



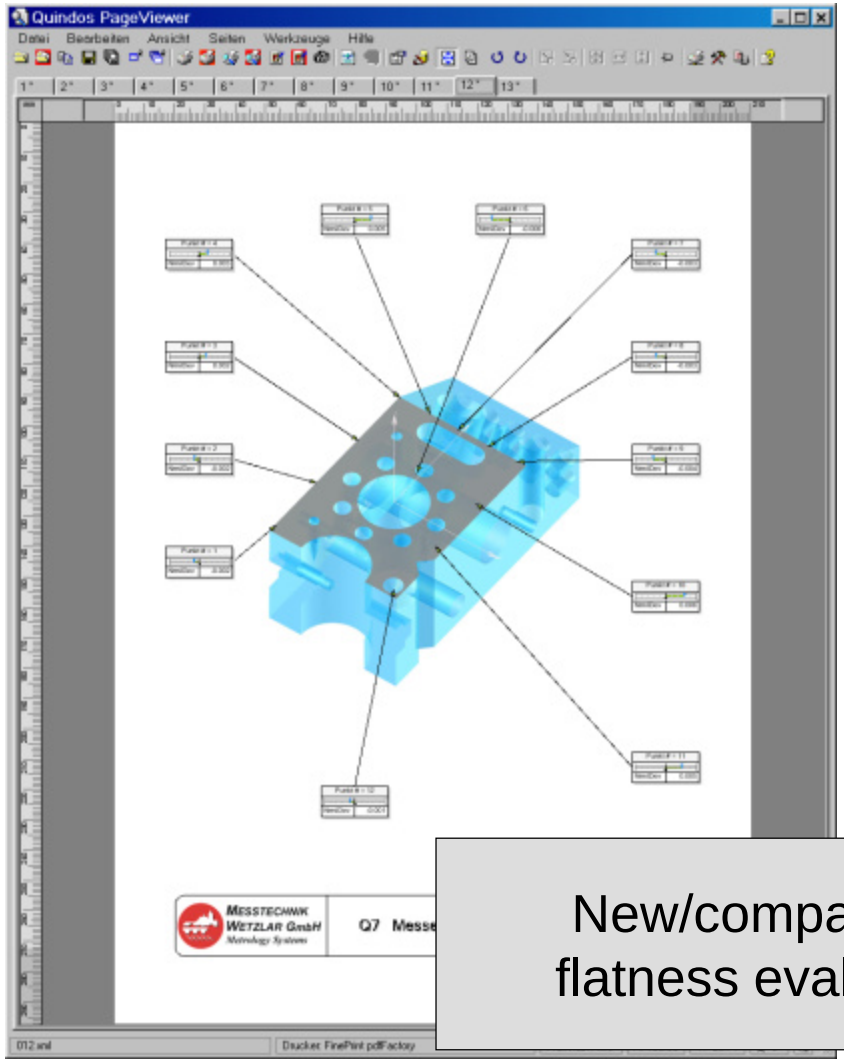
New:
actual-nominal comparison
on CAD Model

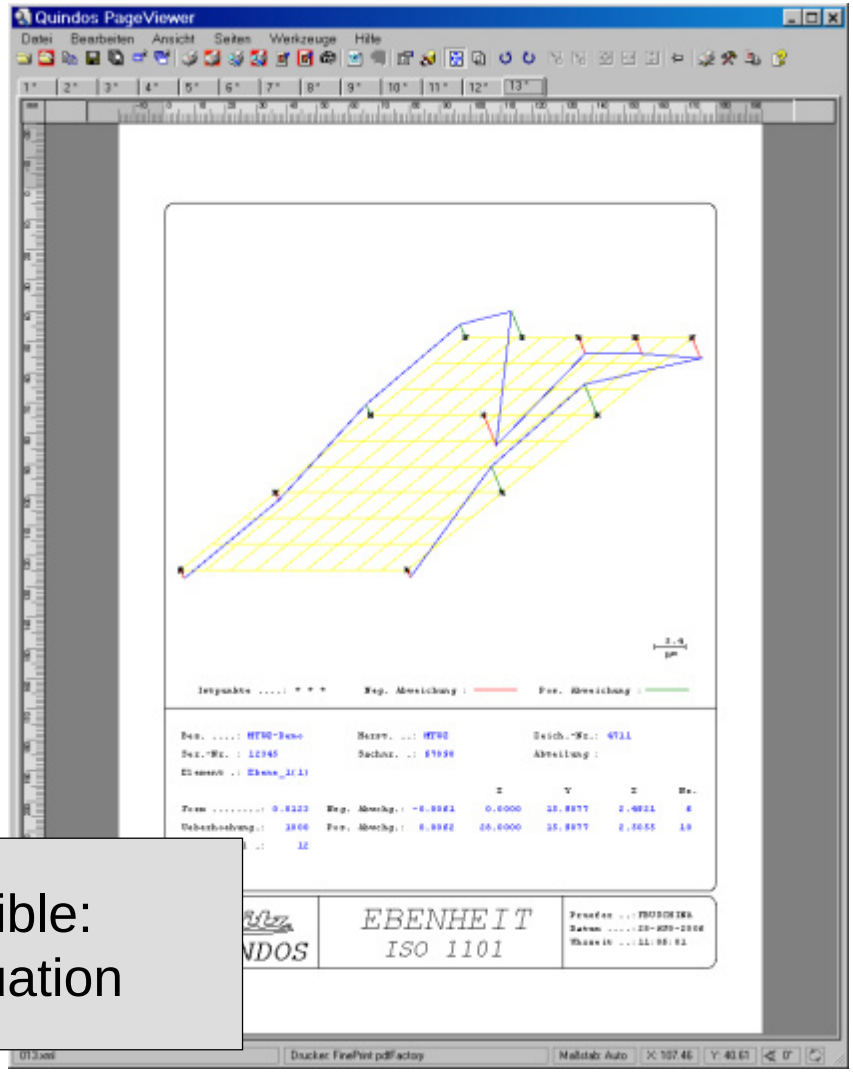
HEXAGON METROLOGY



New/compatible:
Printer/ plotter server
(output to PDF, Images(.jpg,..bmp, …etc),
XML,ASCII ….)

HEXAGON METROLOGY





New/compatible:
flatness evaluation

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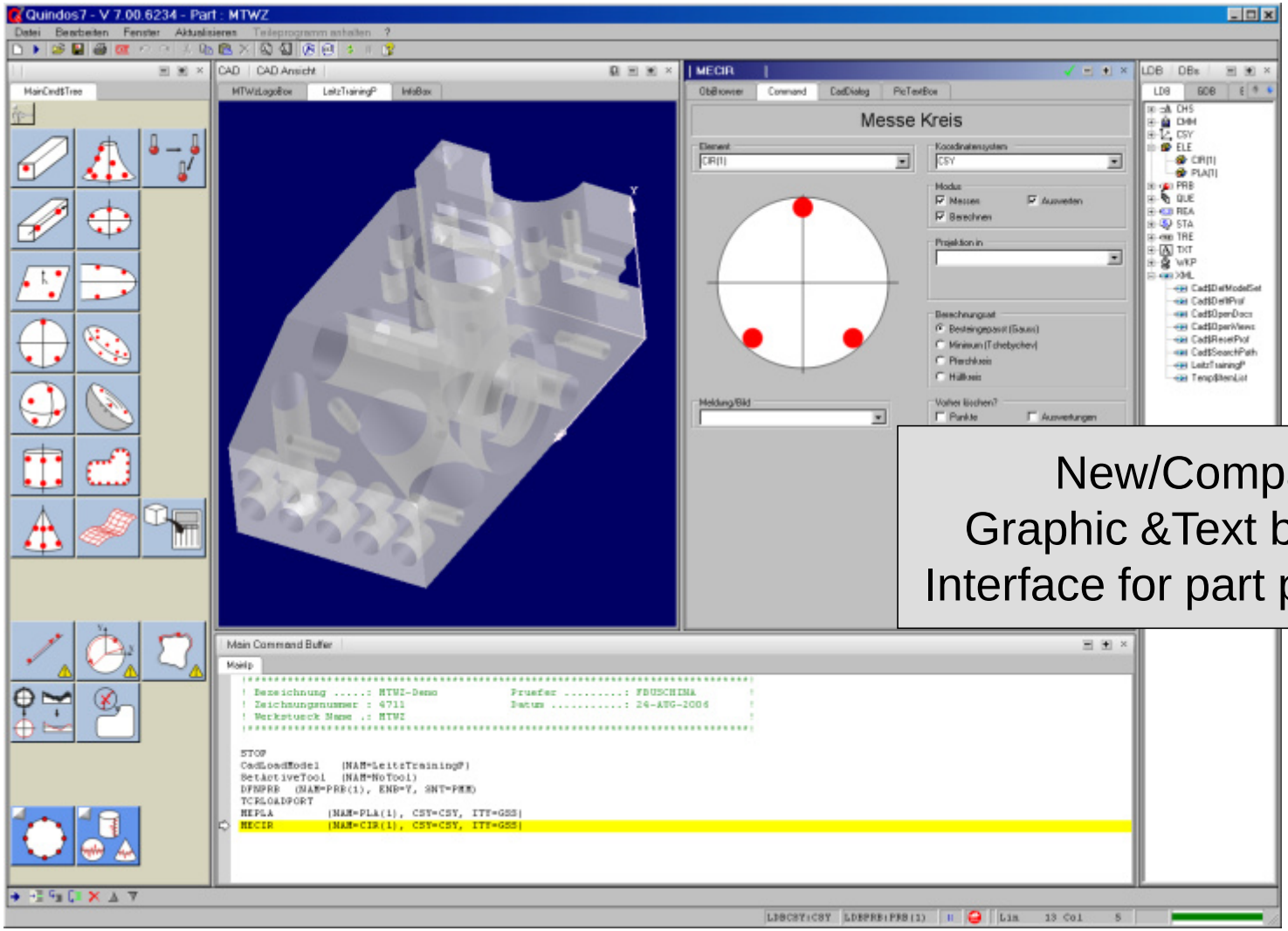
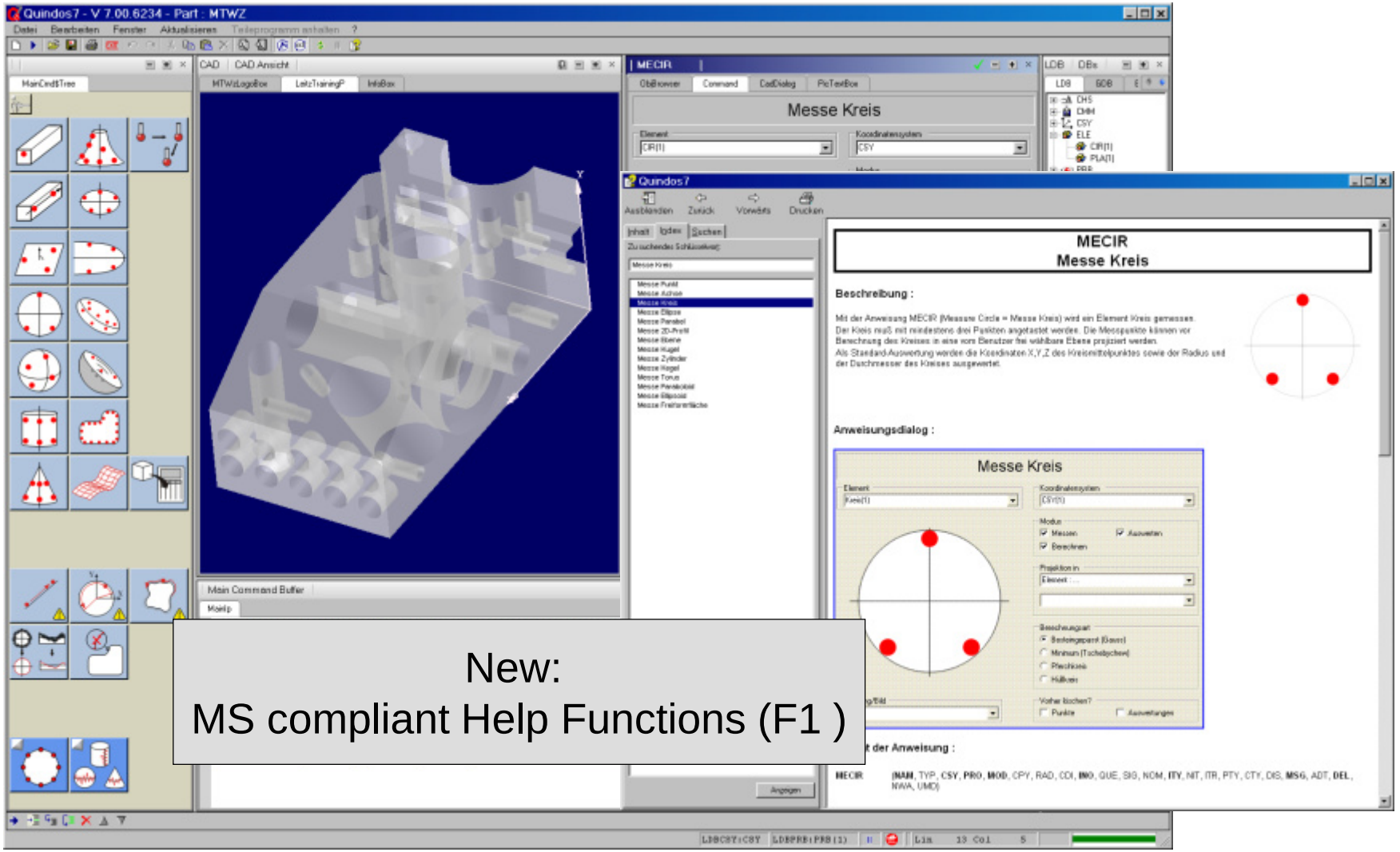


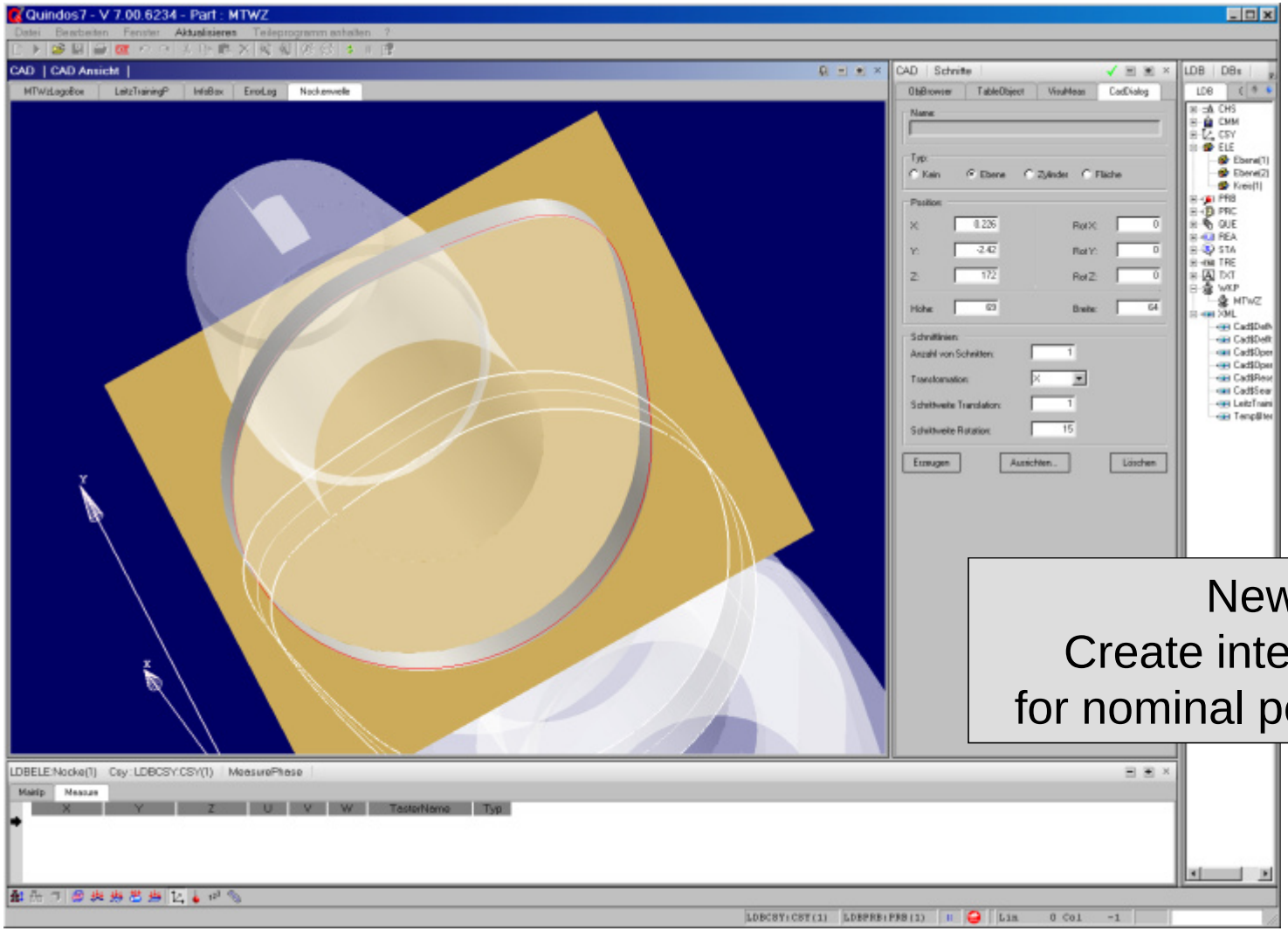
New/Compatible:
Graphic &Text based user
Interface for part programming

HEXAGON METROLOGY



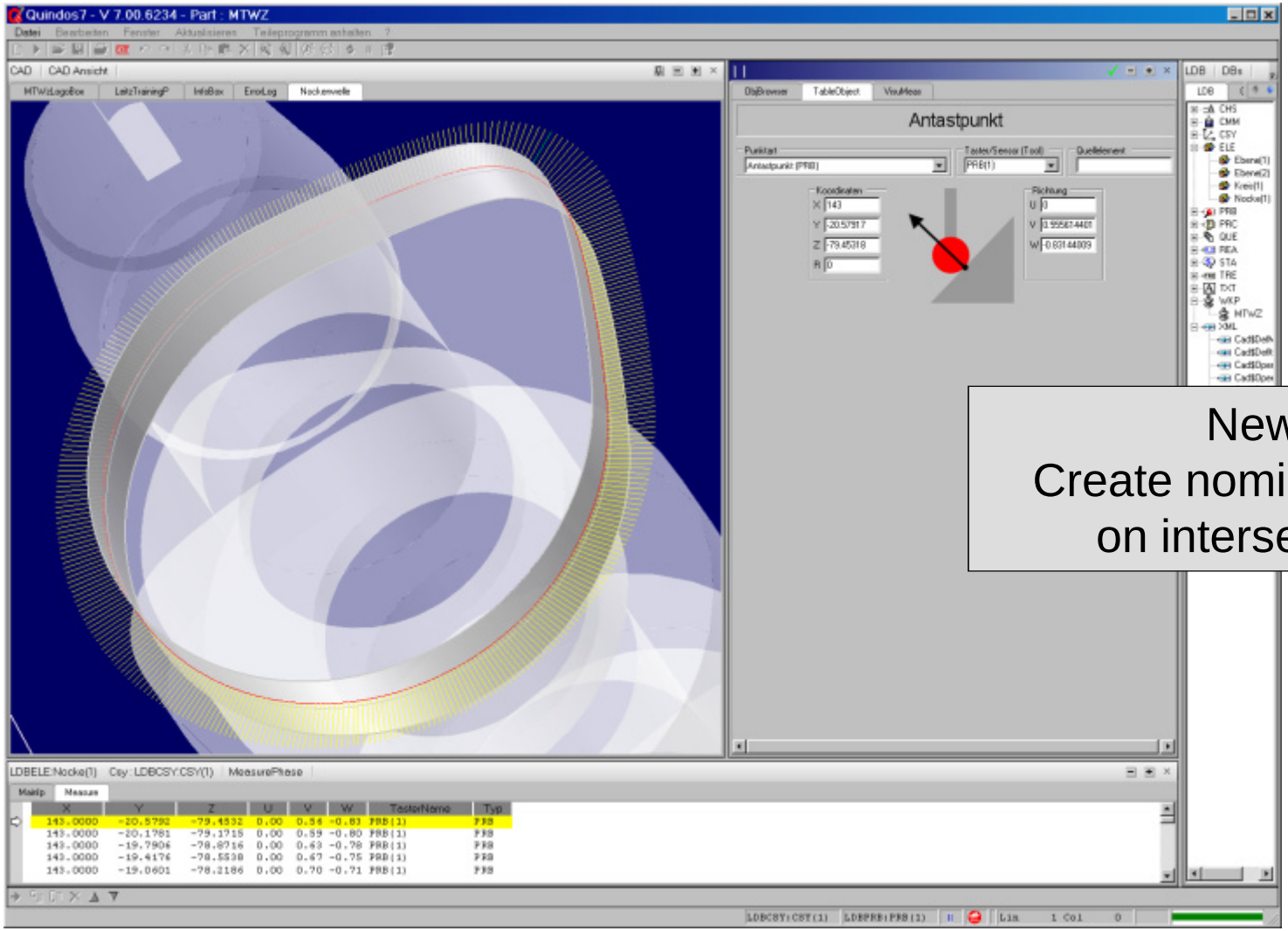
New:
MS compliant Help Functions (F1)

HEXAGON METROLOGY



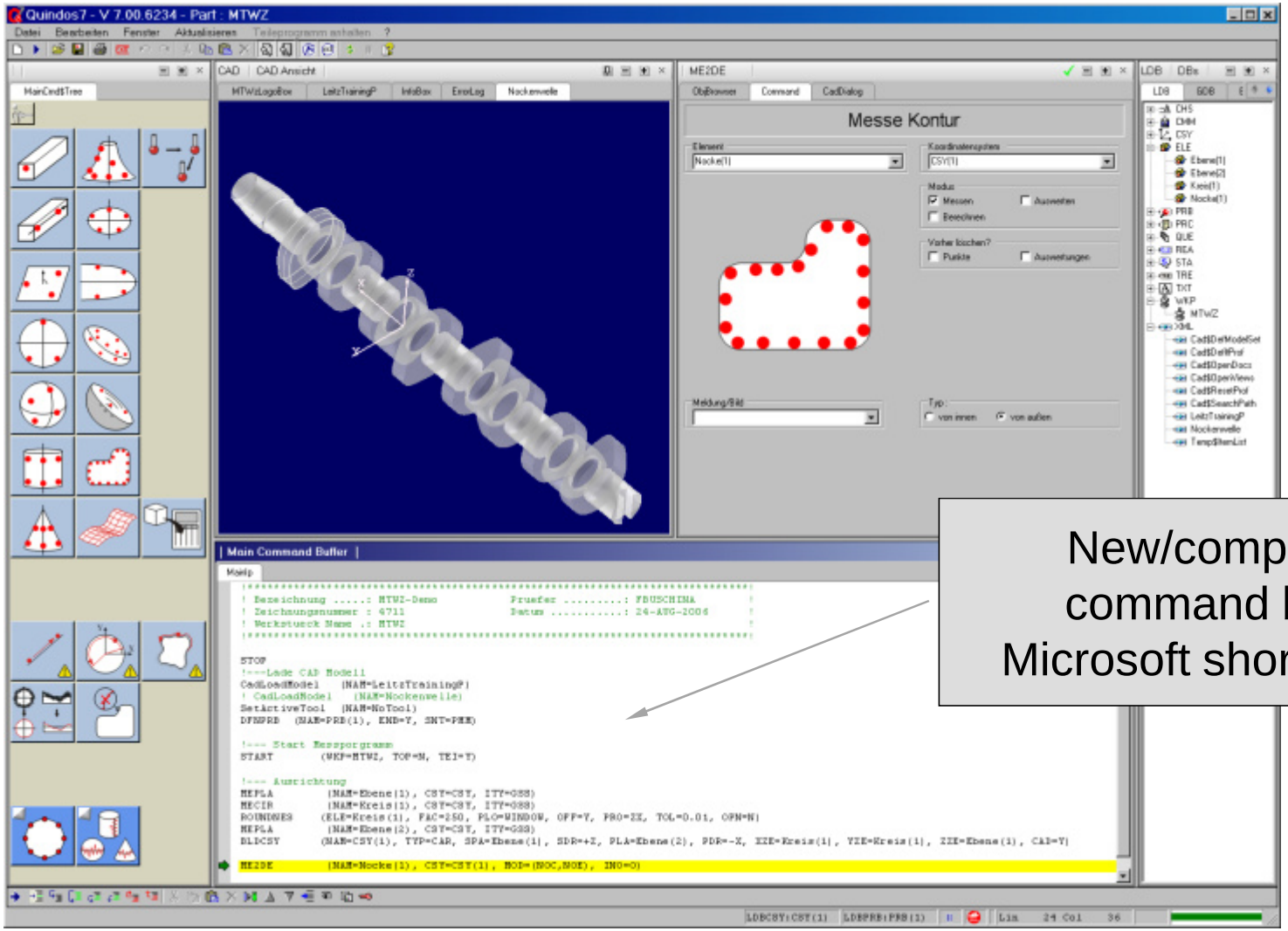
New:
Create intersection
for nominal point pattern

HEXAGON METROLOGY



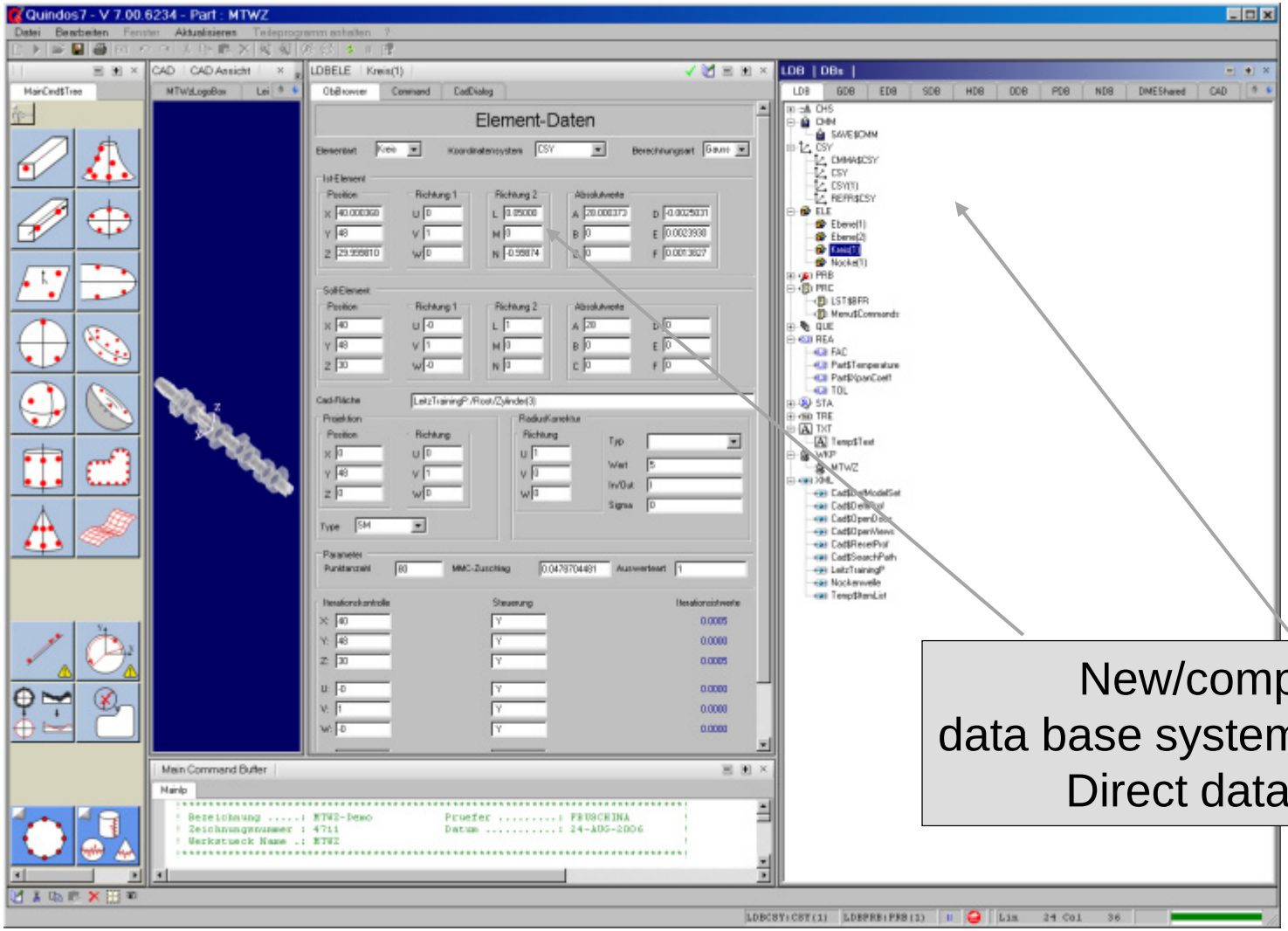
New:
Create nominal points
on intersections

HEXAGON METROLOGY



New/compatible:
command buffer/
Microsoft short cut keys

HEXAGON METROLOGY



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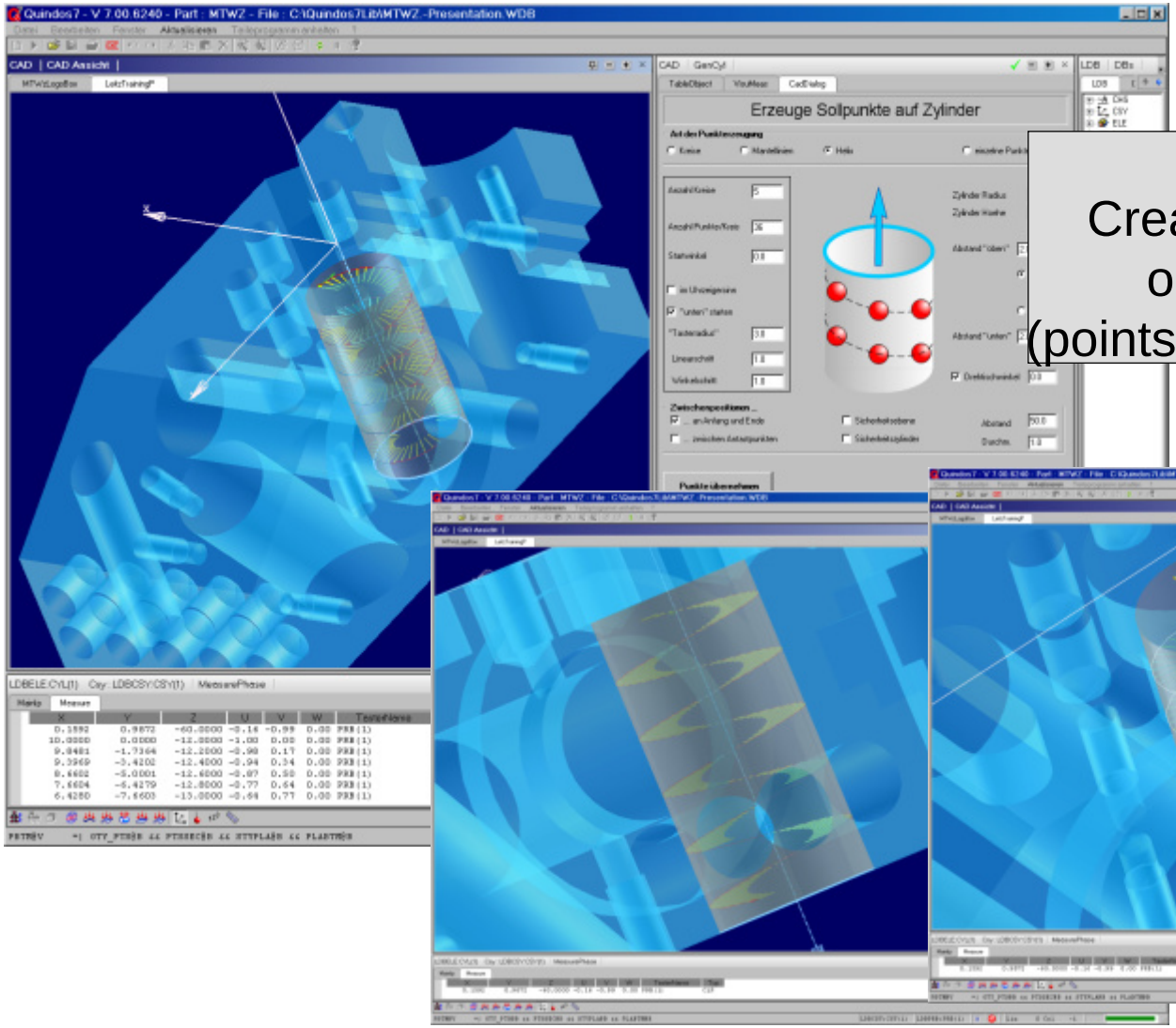
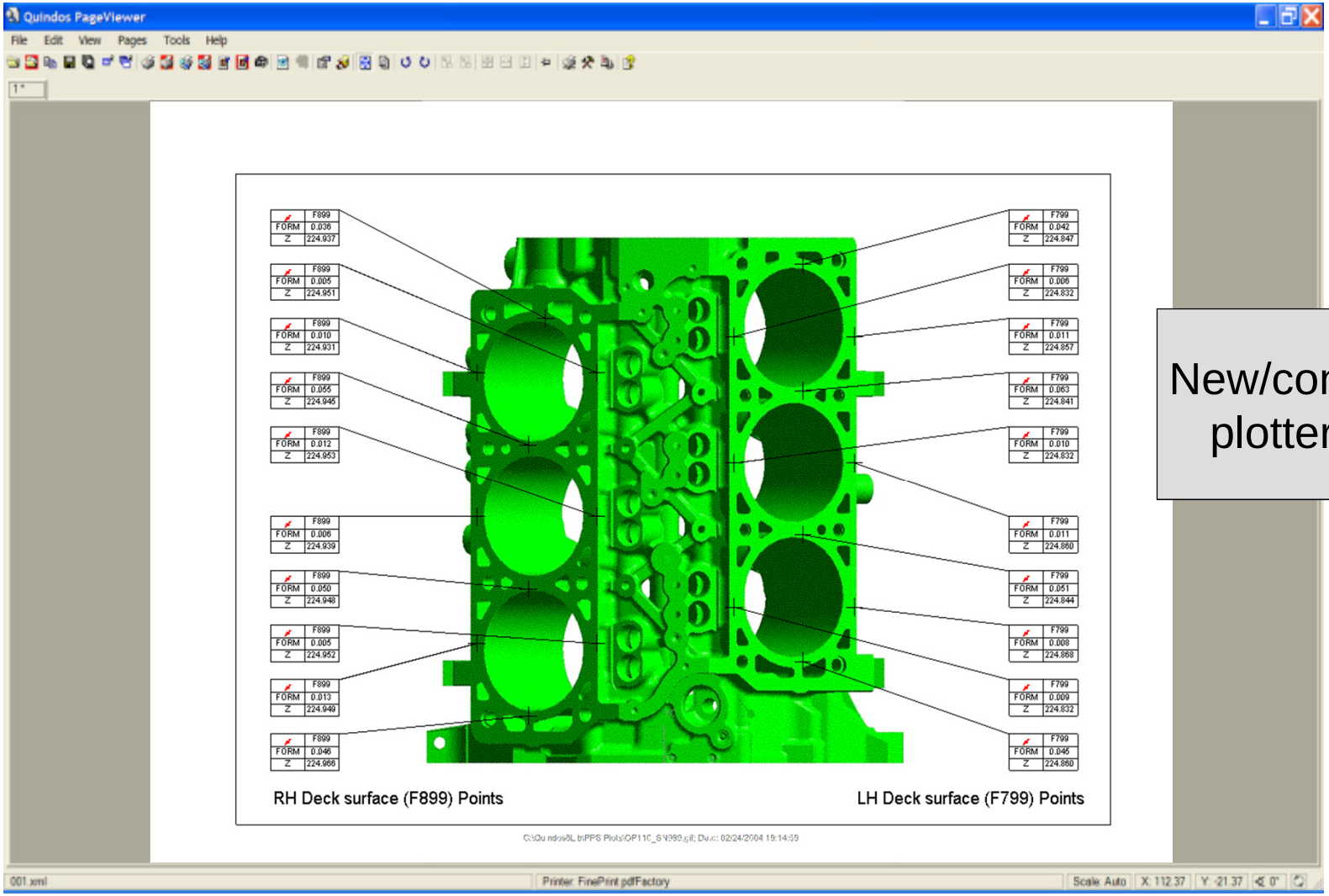


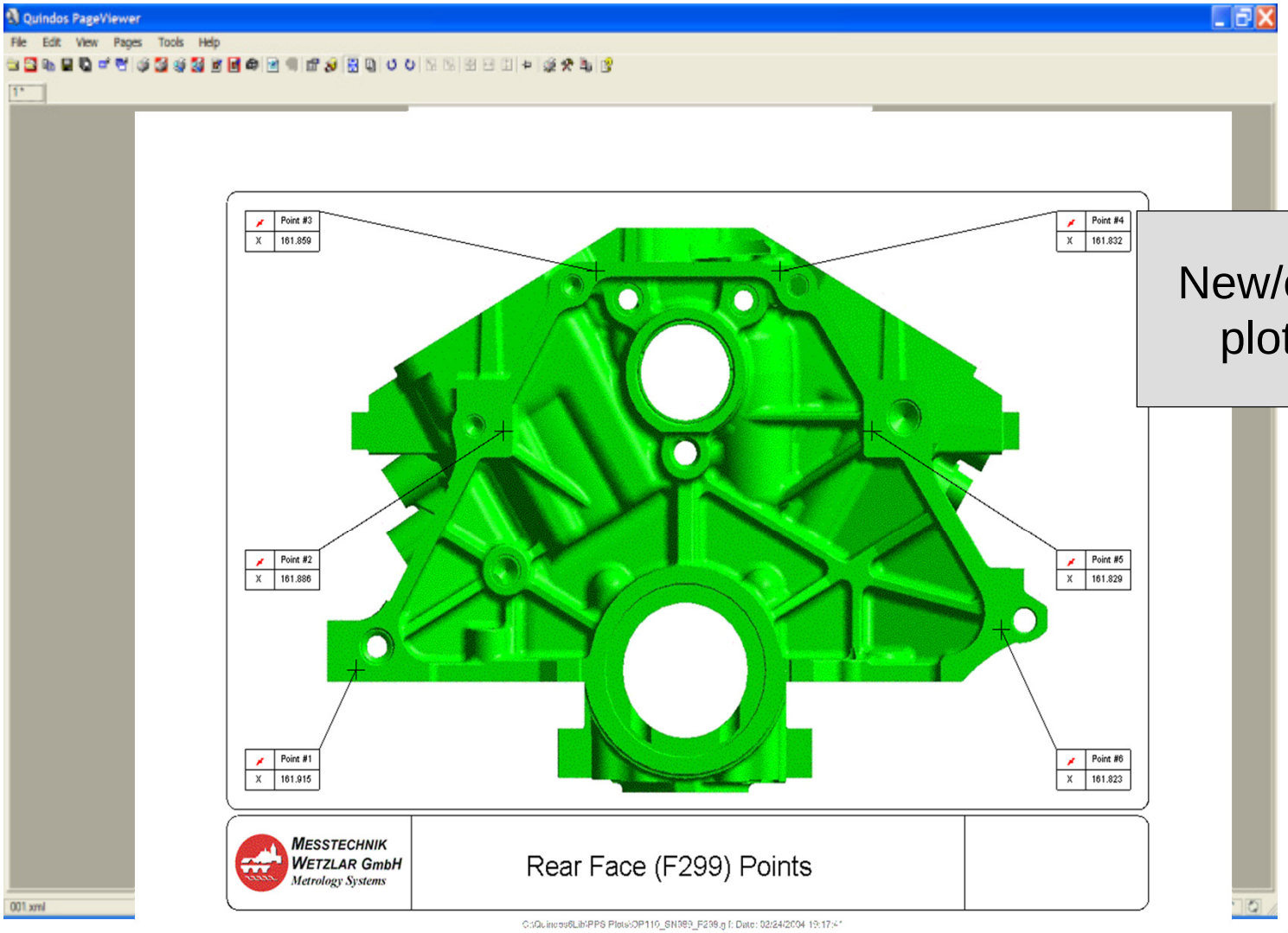
New:
Create nominal points
on basic features
(points on helix for Cylinder)

HEXAGON METROLOGY



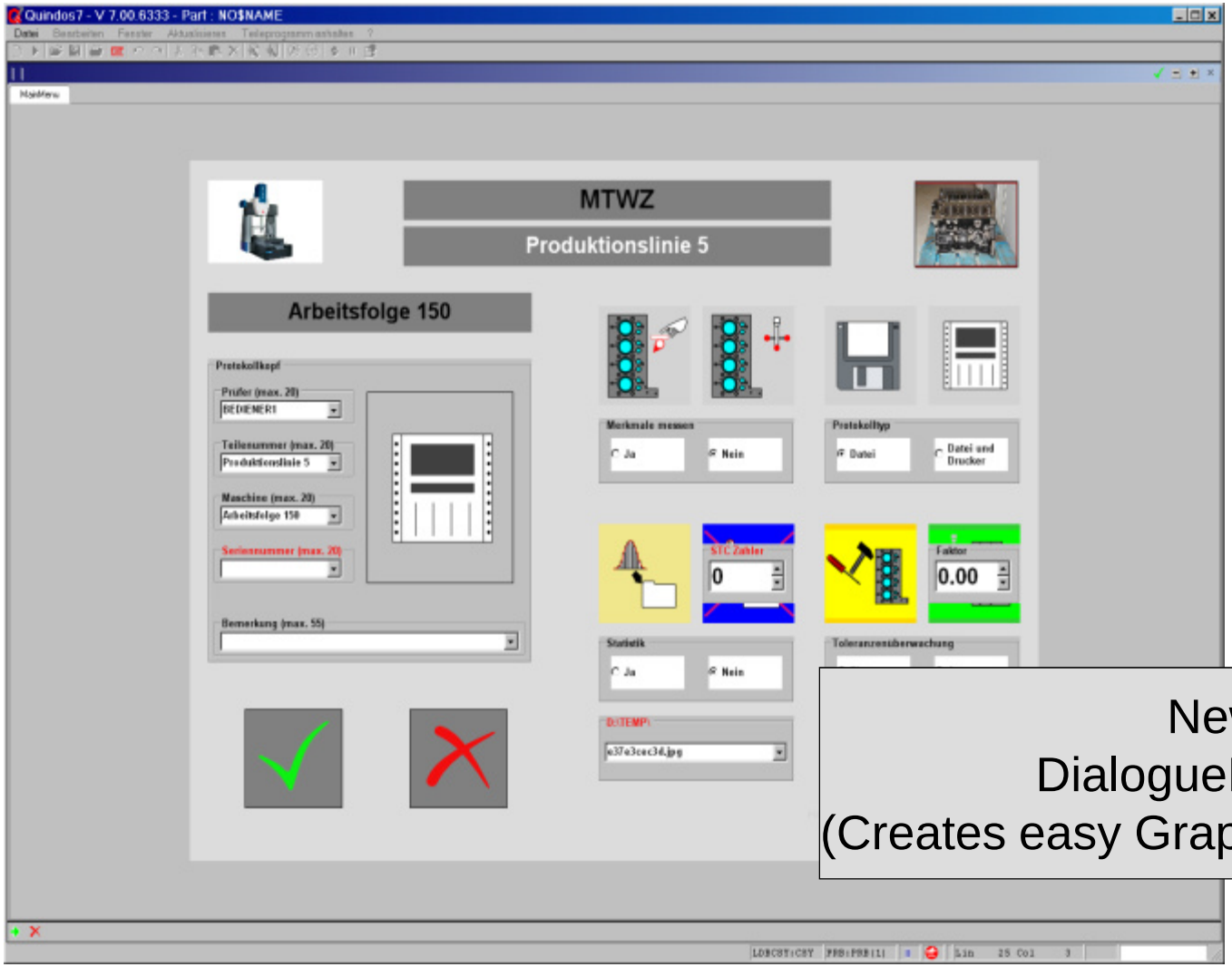
New/compatible:
plotter server

HEXAGON METROLOGY



New/compatible:
plotter server

HEXAGON METROLOGY



New:
DialogueDesigner
(Creates easy Graphic User Interface)

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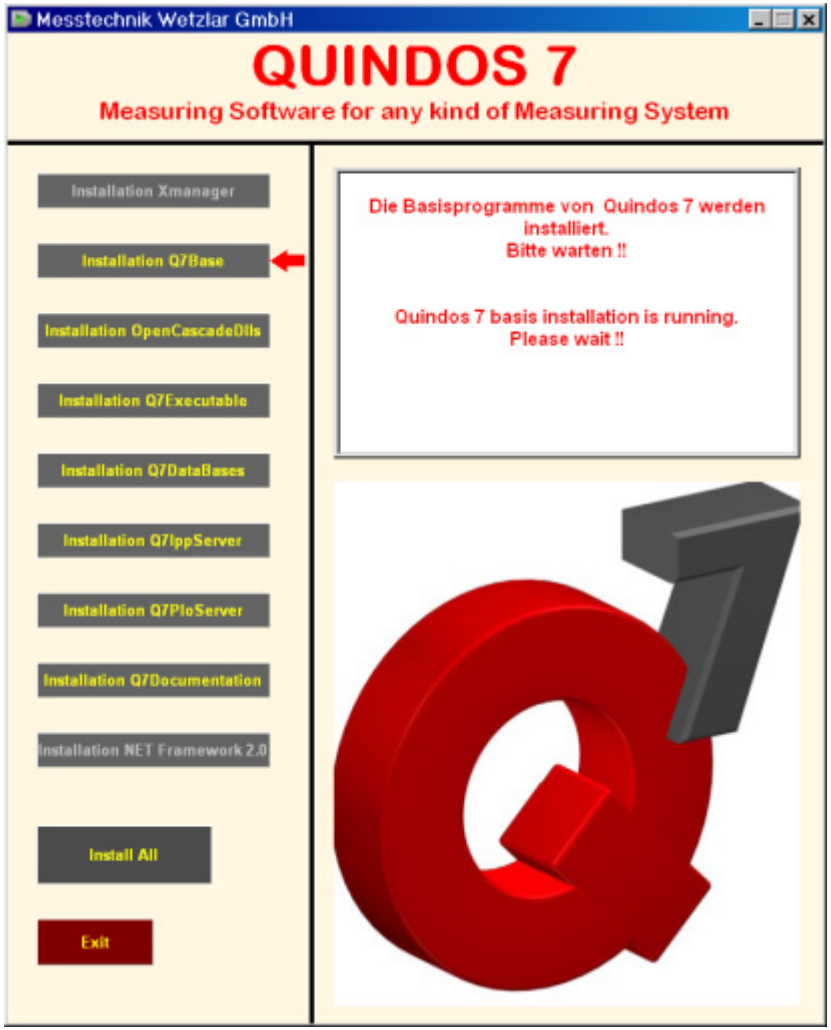

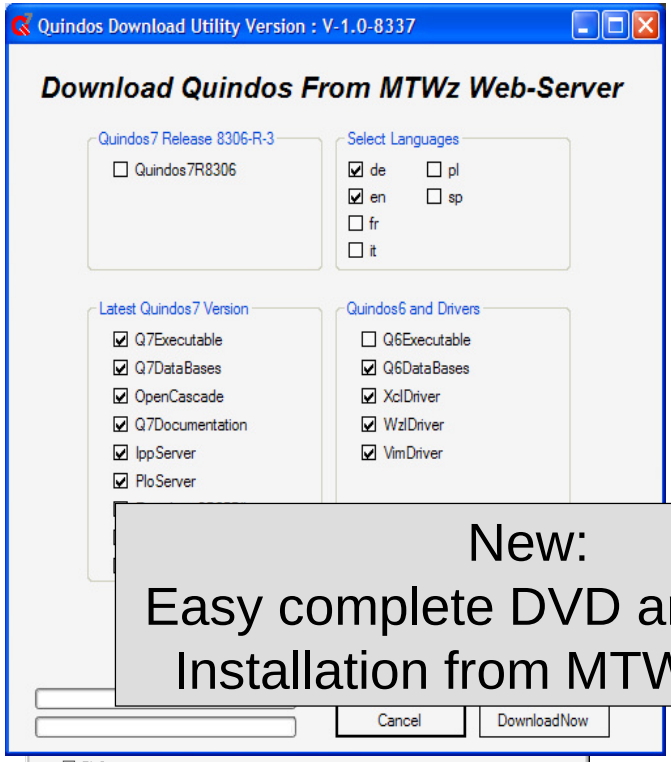

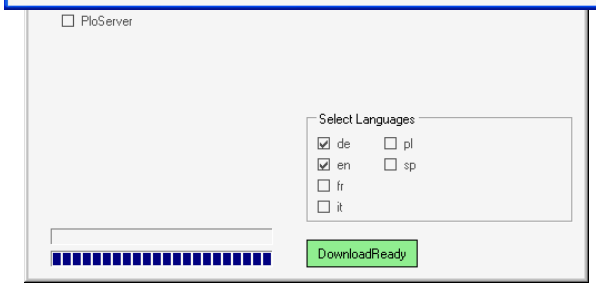

New:
Easy complete DVD and Update Installation from MTWZ Server

HEXAGON METROLOGY

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

PTB

Prüfbericht
Test Report

Gegenstand: *Object:*	Auswertesoftware für Koordinatenmessgeräte *Evaluation software for coordinate measuring machines*
Hersteller: *Manufacturer:*	Messtechnik Wetzlar GmbH Walter Zapp Strasse 4 35578 Wetzlar GERMANY
Typ: *Type:*	QUINDOS Version 7
Gerätenummer: *Serial number:*	
Auftraggeber: *Applicant:*	Messtechnik Wetzlar GmbH Walter Zapp Strasse 4 35578 Wetzlar GERMANY
Anzahl der Seiten: *Number of pages:*	4
Geschäftszeichen: *Reference No.:*	PTB-5.3-2006-084
Prüfzeichen: *Test mark:*	PTB-5.3-2006-084
Datum der Prüfung: *Date of test:*	2006-11-17
Im Auftrag: *By order:*	Braunschweig, 2006-11-20 Dr.-Ing. H. Schwenke
Siegel *Seal:*	
Bearbeiter: *Examiner:*	Dipl.-Ing. N. Gerwien

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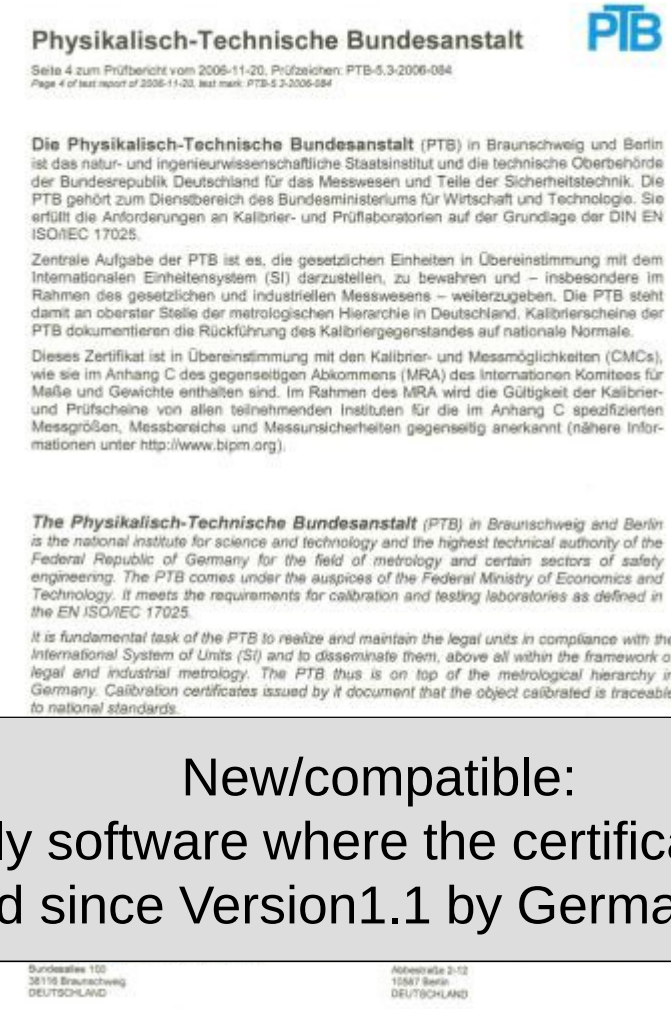

Physikalisch-Technische Bundesanstalt

PTB

Die Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig und Berlin ist das natur- und ingenieurwissenschaftliche Staatsinstitut und die technische Oberbehörde der Bundesrepublik Deutschland für das Messwesen und Teile der Sicherheitstechnik. Die PTB gehört zum Dienstbereich des Bundesministeriums für Wirtschaft und Technologie. Sie erfüllt die Anforderungen an Kalibrier- und Prüflaboratorien auf der Grundlage der DIN EN ISO/IEC 17025.

Zentrale Aufgabe der PTB ist es, die gesetzlichen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI) darzustellen, zu bewahren und – insbesondere im Rahmen des gesetzlichen und industriellen Messwesens – weiterzugeben. Die PTB steht damit an oberster Stelle der metrologischen Hierarchie in Deutschland. Kalibrierscheine der PTB dokumentieren die Rückführung des Kalibriergegenstandes auf nationale Normale.

Dieses Zertifikat ist in Übereinstimmung mit den Kalibrier- und Messmöglichkeiten (CMCs), wie sie im Anhang C des gegenseitigen Abkommens (MRA) des Internationen Komitees für Maße und Gewichte enthalten sind. Im Rahmen des MRA wird die Gültigkeit der Kalibrier- und Prüfscheine von allen teilnehmenden Instituten für die im Anhang C spezifizierten Messgrößen, Messbereiche und Messunsicherheiten gegenseitig anerkannt (nähere Informationen unter http://www.bipm.org).

The Physikalisch-Technische Bundesanstalt *(PTB) in Braunschweig and Berlin is the national institute for science and technology and the highest technical authority of the Federal Republic of Germany for the field of metrology and certain sectors of safety engineering. The PTB comes under the auspices of the Federal Ministry of Economics and Technology. It meets the requirements for calibration and testing laboratories as defined in the EN ISO/IEC 17025.*

It is fundamental task of the PTB to realize and maintain the legal units in compliance with the International System of Units (SI) and to disseminate them, above all within the framework of legal and industrial metrology. The PTB thus is on top of the metrological hierarchy in Germany. Calibration certificates issued by it document that the object calibrated is traceable to national standards.

Bundesallee 100
38116 Braunschweig
DEUTSCHLAND

Abbestraße 2-12
10587 Berlin
DEUTSCHLAND

New/compatible:
Only software where the certification is valid since Version1.1 by German PTB

HEXAGON METROLOGY

Physikalisch-Technische Bundesanstalt

PTB

Braunschweig und Berlin

Bericht
Report

Gegenstand: Testdaten für evolventische Zylinderradauswertungen
Object: Testdata for cylindrical involute gear algorithms

Hersteller: Leitz Messtechnik GmbH
Siegmund-Hiepe-Str. 2-12
35578 Wetzlar

Typ: QUINDOS 4304

Gerätenummer: ---

Antragsteller: Leitz Messtechnik GmbH
Siegmund-Hiepe-Str. 2-12
35578 Wetzlar

Anzahl der Seiten des Berichtes: 4

Geschäftszeichen: PTB-5.33-04.046

Prüfzeichen: ---

Datum der Prüfung: 2004-09-02

Im Auftrag — Braunschweig, 2004-09-24 — Bearbeiter:

Siegel

Dr.-Ing. Franz Wäldele
Direktor und Professor

Dr.-Ing. Frank Härtig

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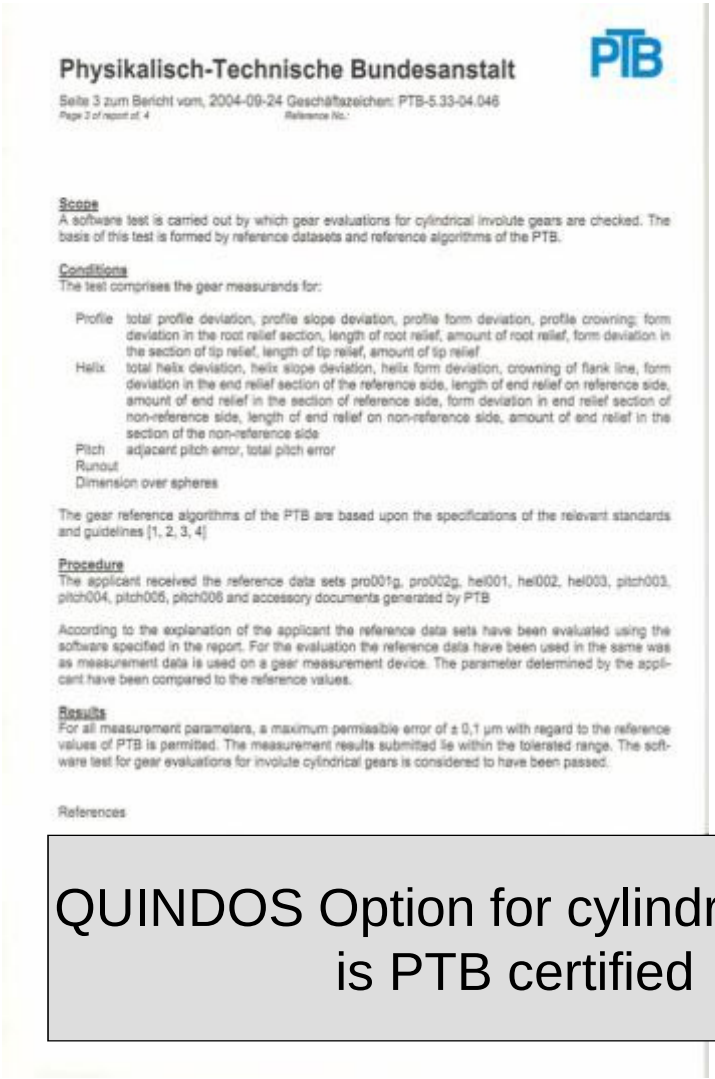

Physikalisch-Technische Bundesanstalt

PTB

Seite 3 zum Bericht vom, 2004-09-24 Geschäftszeichen: PTB-5.33-04.046
Page 3 of report of: 4 Reference No.:

Scope
A software test is carried out by which gear evaluations for cylindrical involute gears are checked. The basis of this test is formed by reference datasets and reference algorithms of the PTB.

Conditions
The test comprises the gear measurands for:

Profile: total profile deviation, profile slope deviation, profile form deviation, profile crowning; form deviation in the root relief section, length of root relief, amount of root relief, form deviation in the section of tip relief, length of tip relief, amount of tip relief
Helix: total helix deviation, helix slope deviation, helix form deviation, crowning of flank line, form deviation in the end relief section of the reference side, length of end relief on reference side, amount of end relief in the section of reference side, form deviation in end relief section of non-reference side, length of end relief on non-reference side, amount of end relief in the section of the non-reference side
Pitch: adjacent pitch error, total pitch error
Runout
Dimension over spheres

The gear reference algorithms of the PTB are based upon the specifications of the relevant standards and guidelines [1, 2, 3, 4]

Procedure
The applicant received the reference data sets pro001g, pro002g, hel001, hel002, hel003, pitch003, pitch004, pitch005, pitch006 and accessory documents generated by PTB

According to the explanation of the applicant the reference data sets have been evaluated using the software specified in the report. For the evaluation the reference data have been used in the same way as measurement data is used on a gear measurement device. The parameter determined by the applicant have been compared to the reference values.

Results
For all measurement parameters, a maximum permissible error of ± 0,1 µm with regard to the reference values of PTB is permitted. The measurement results submitted lie within the tolerated range. The software test for gear evaluations for involute cylindrical gears is considered to have been passed.

References

QUINDOS Option for cylindrical Gears is PTB certified

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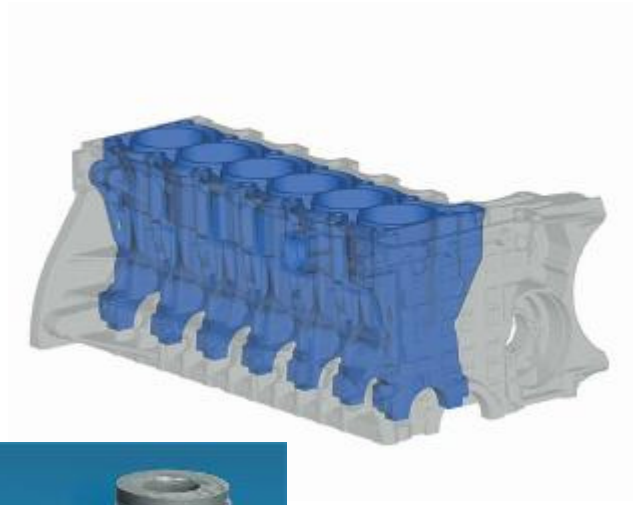
New Quindos Options

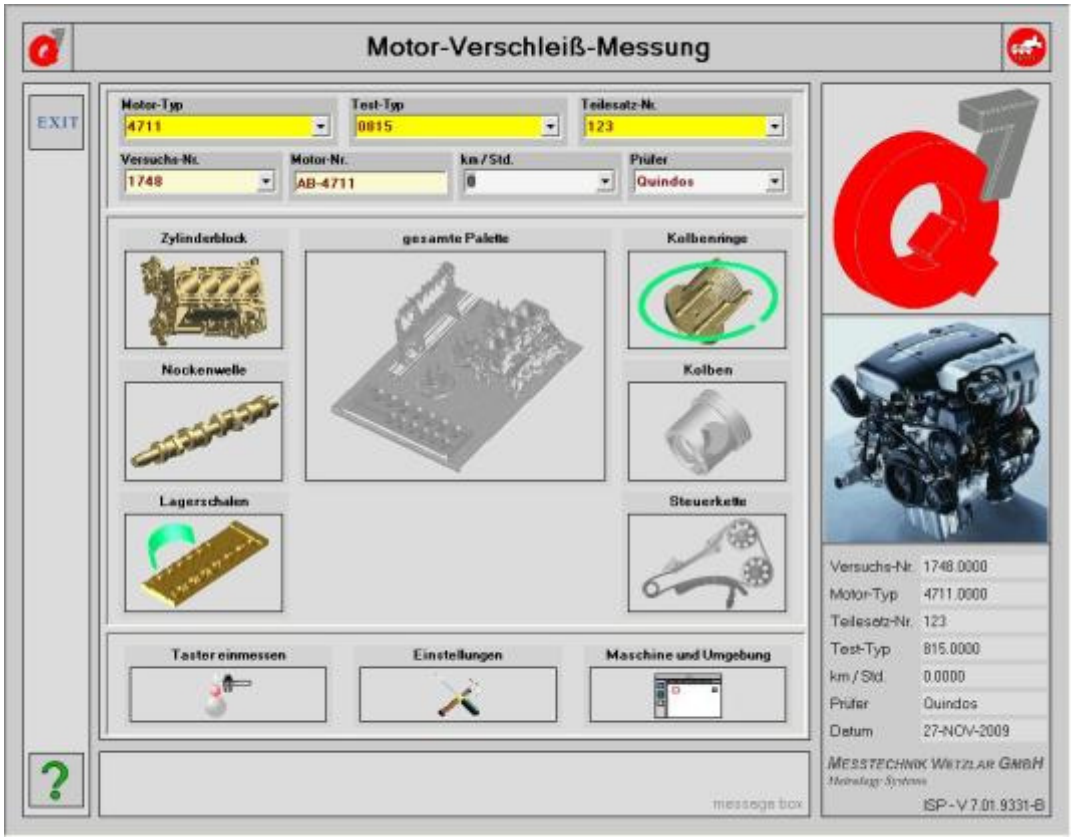
- Abrasive wear measurement at automotive parts
- Unknown Camshaft (reverse engineering)
- Curvic coupling
- Ultimate Blade
- Impeller

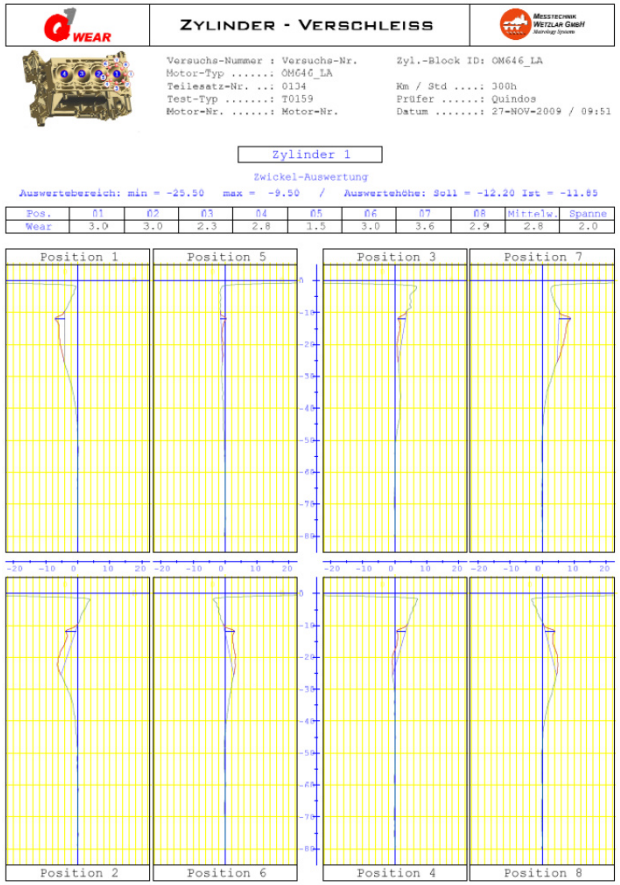
Abrasive wear measurement

- Camshaft
- Crankcase
- Bearing
- Piston ring
- Piston



- Crankcase (block)





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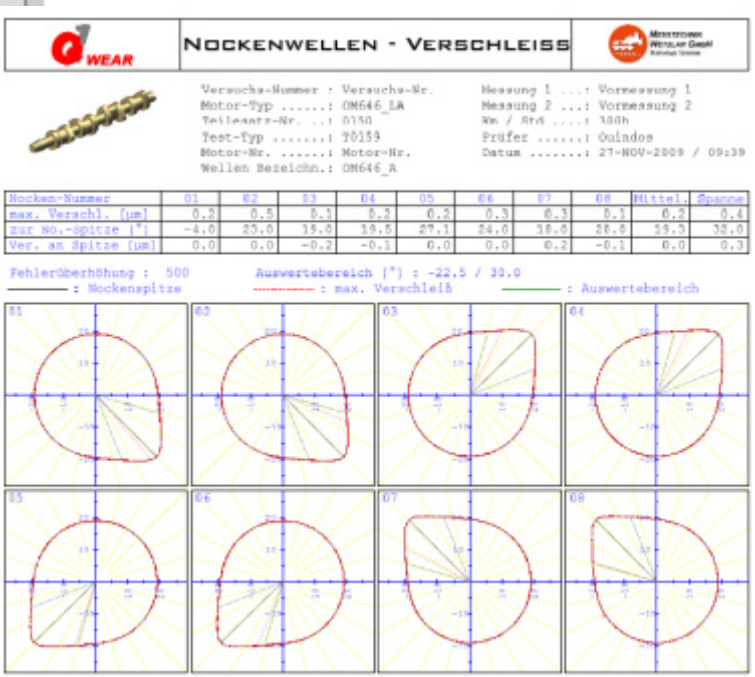
- Camshaft



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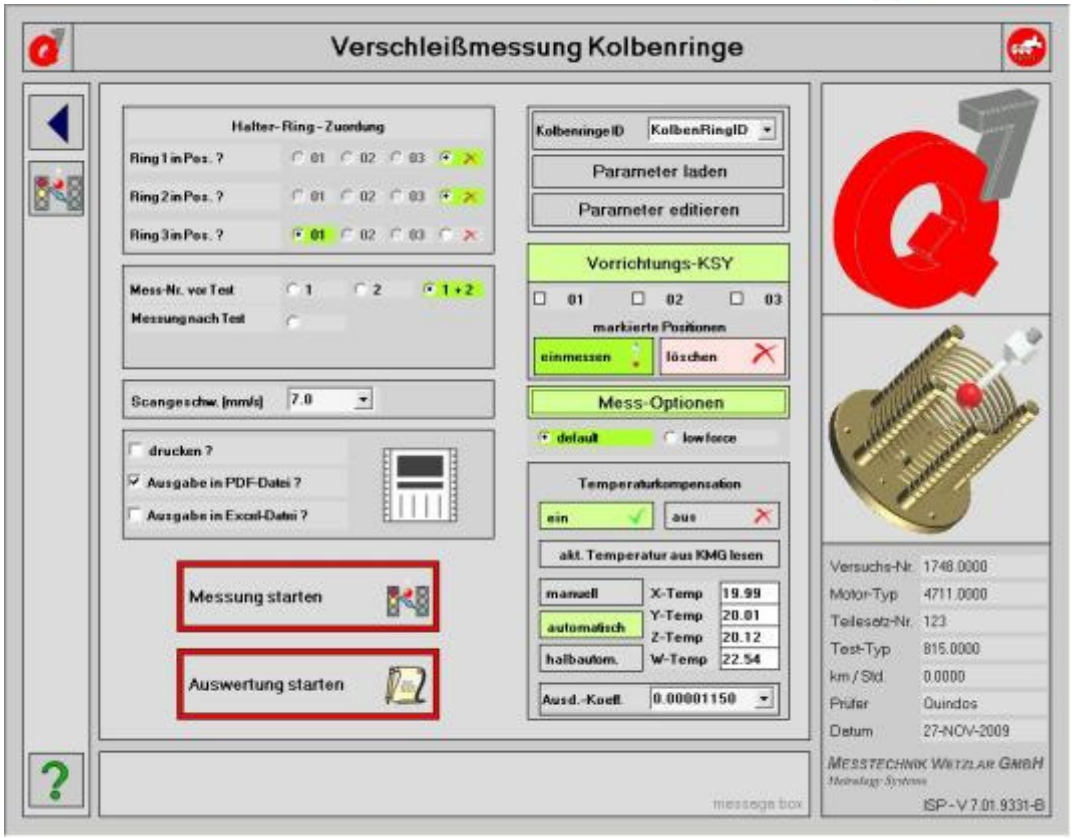
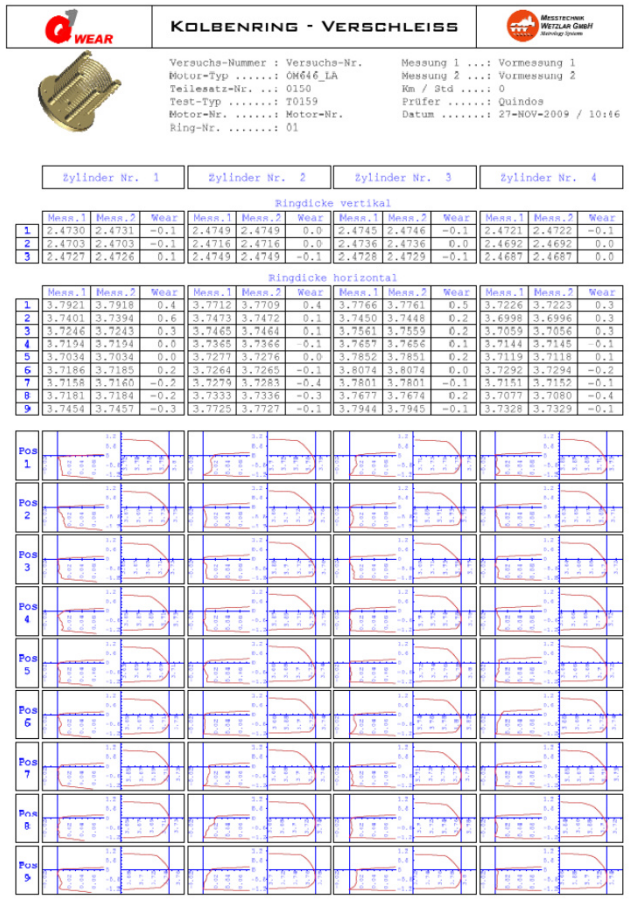
- Pistonring





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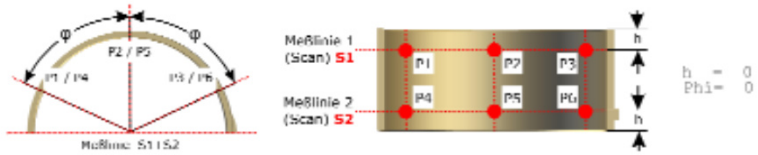
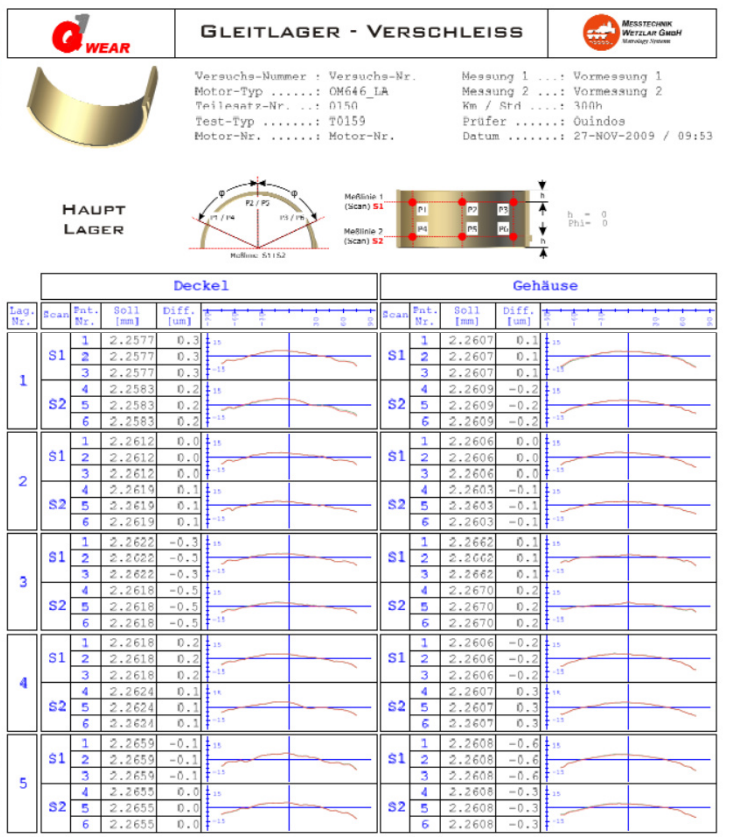
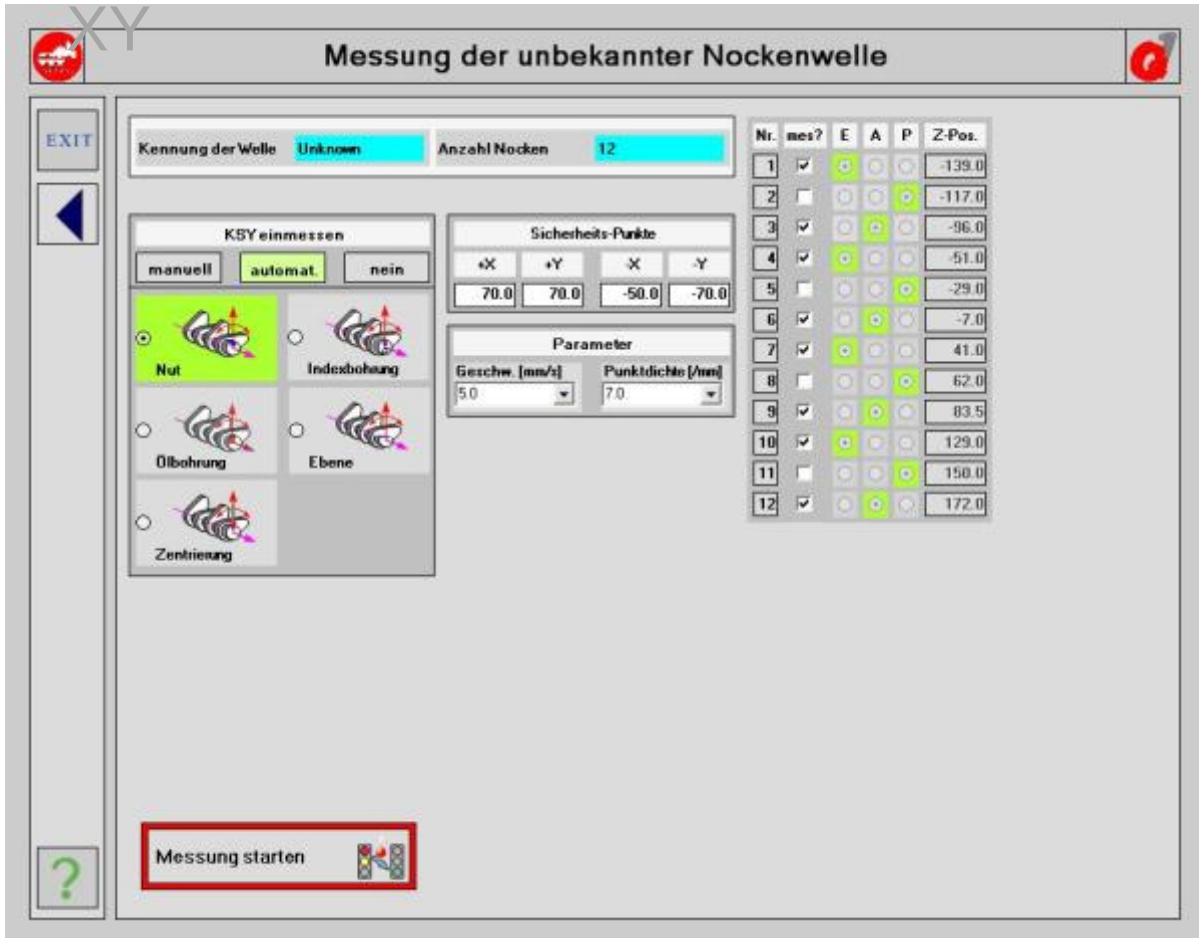
- Bearing





HEXAGON METROLOGY

- unknown Camshaft – CAMSHAFT



HEXAGON METROLOGY

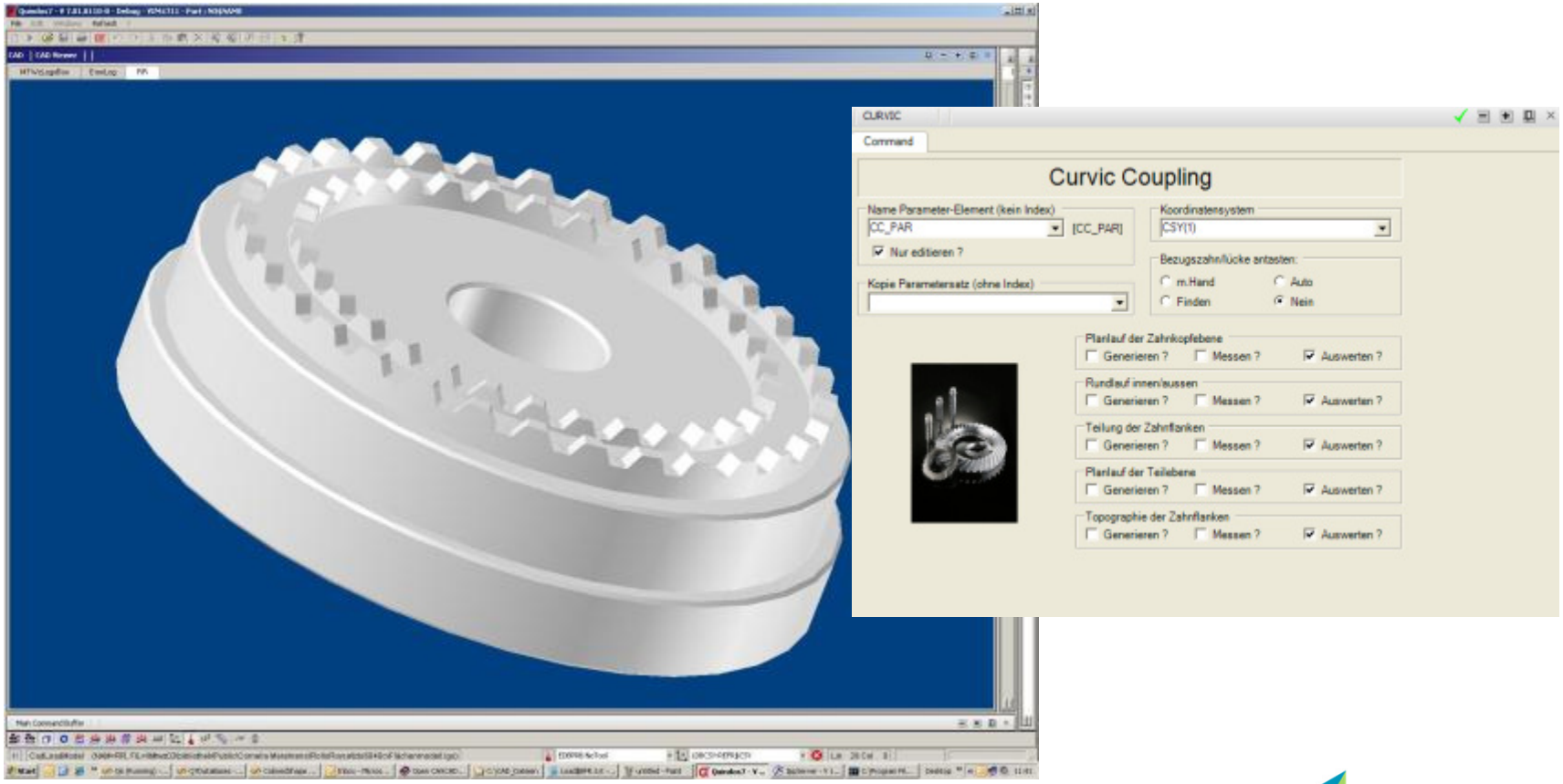
Curvic Couplings

Toothed gears used for accurate mating & centering of rotating parts.

Applications:

- Turbine rotors
- Crankshafts

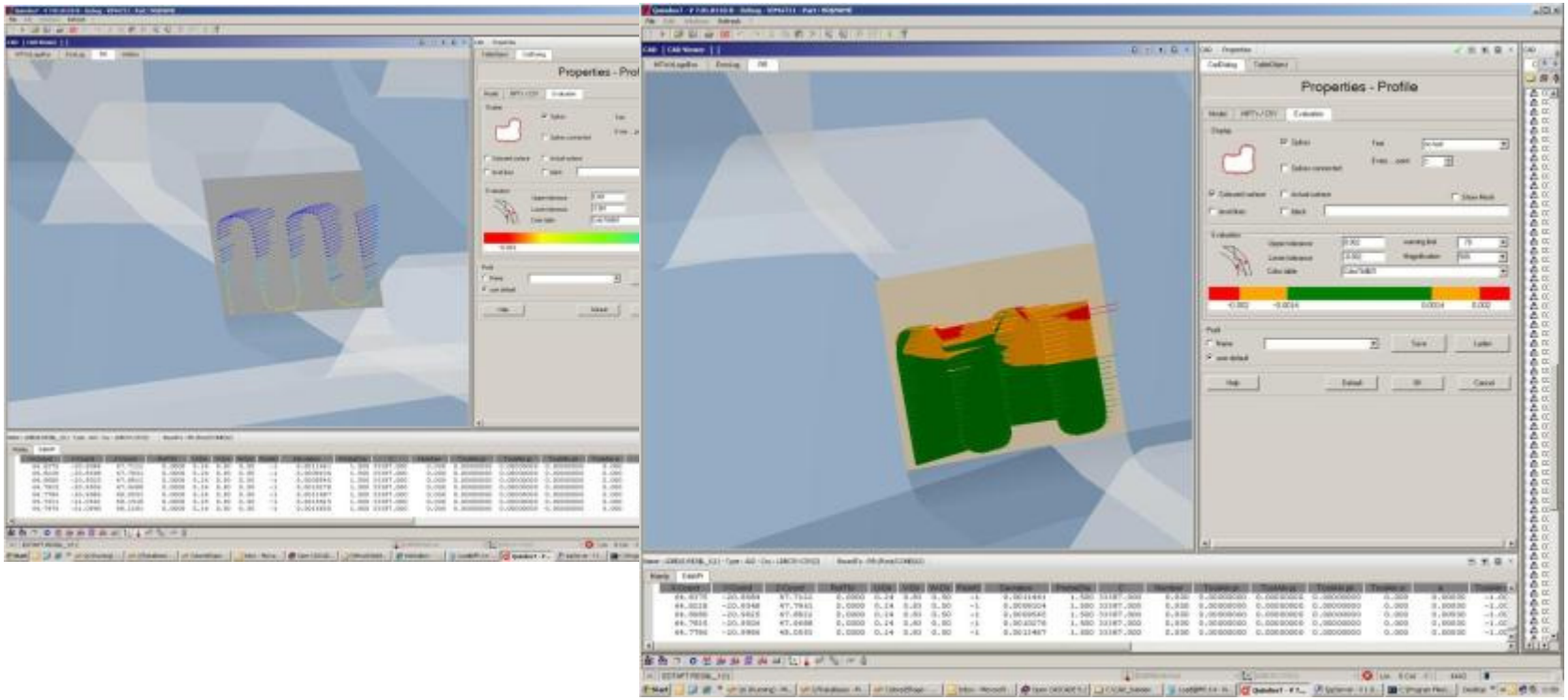
Curvic coupling master model generated in QUINDOS using the curvic coupling data



HEXAGON METROLOGY

Topography measurement & results representation on the CAD model.

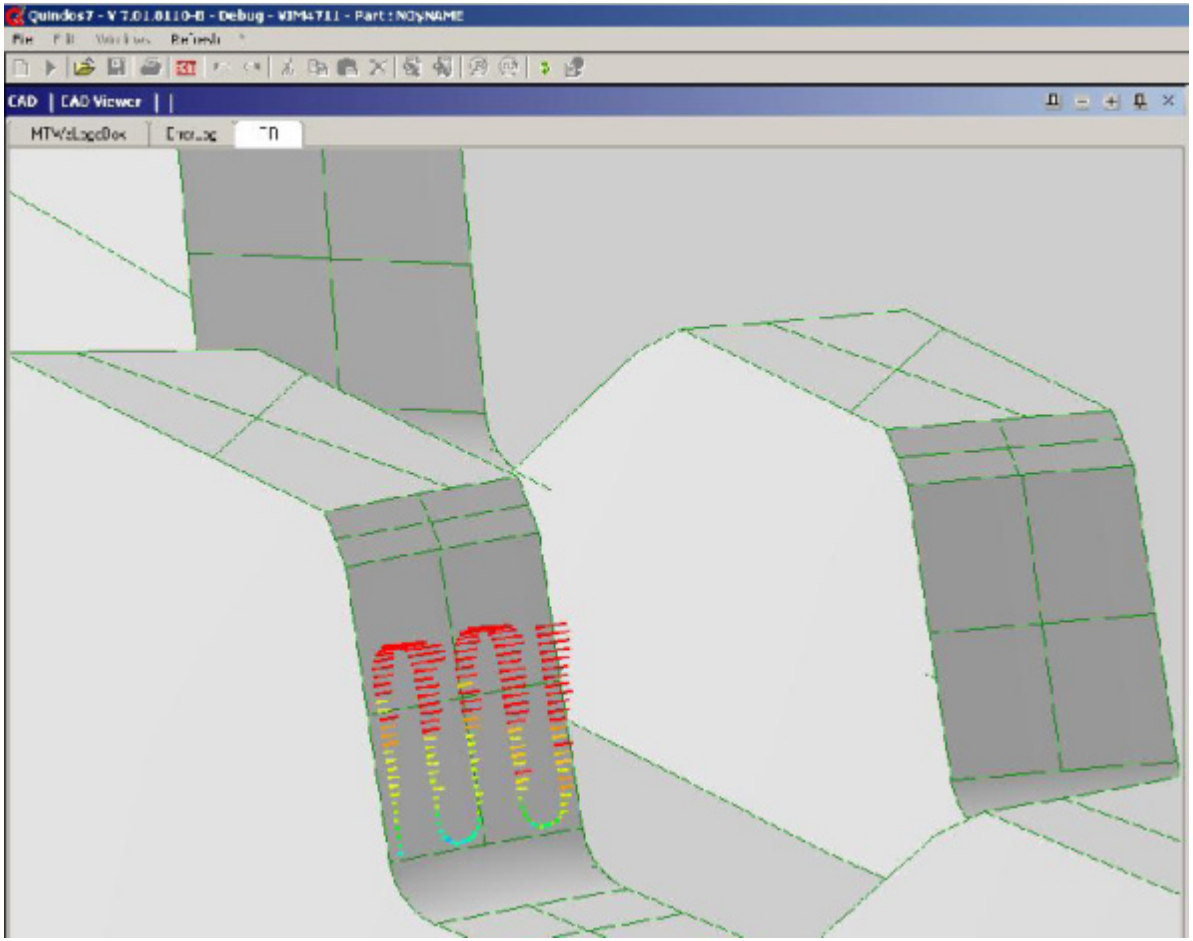
The representation of the deviations can be modified using the dialogue.



HEXAGON METROLOGY

Topography measurement & contact representation

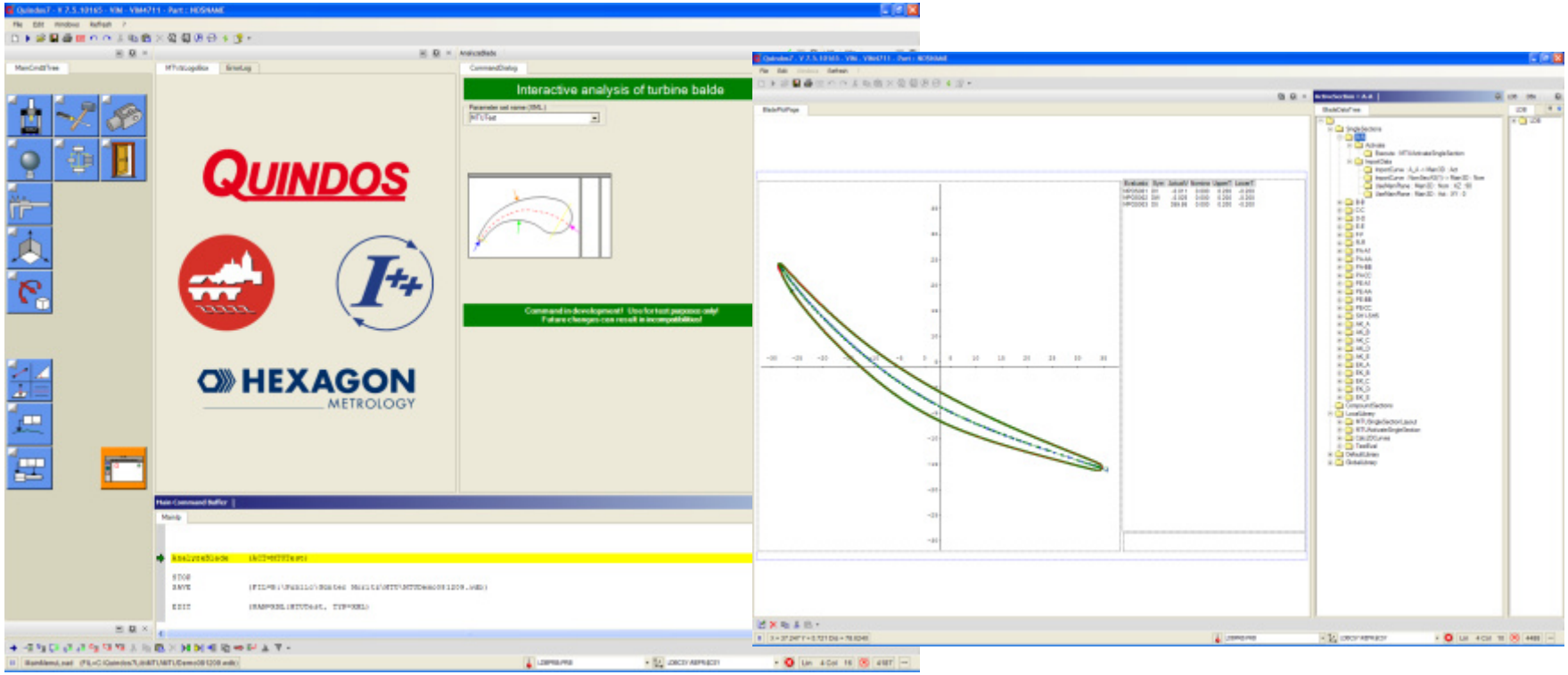
Sweep scanning of the topography is used to determine the contact pattern of the CC to be checked. All of the flanks are measured in order to determine a true representation of the pairing quality of the curvic coupling with a master coupling. The result of the pairing is the eccentricity, axial runout & radial runout & pairing quality.



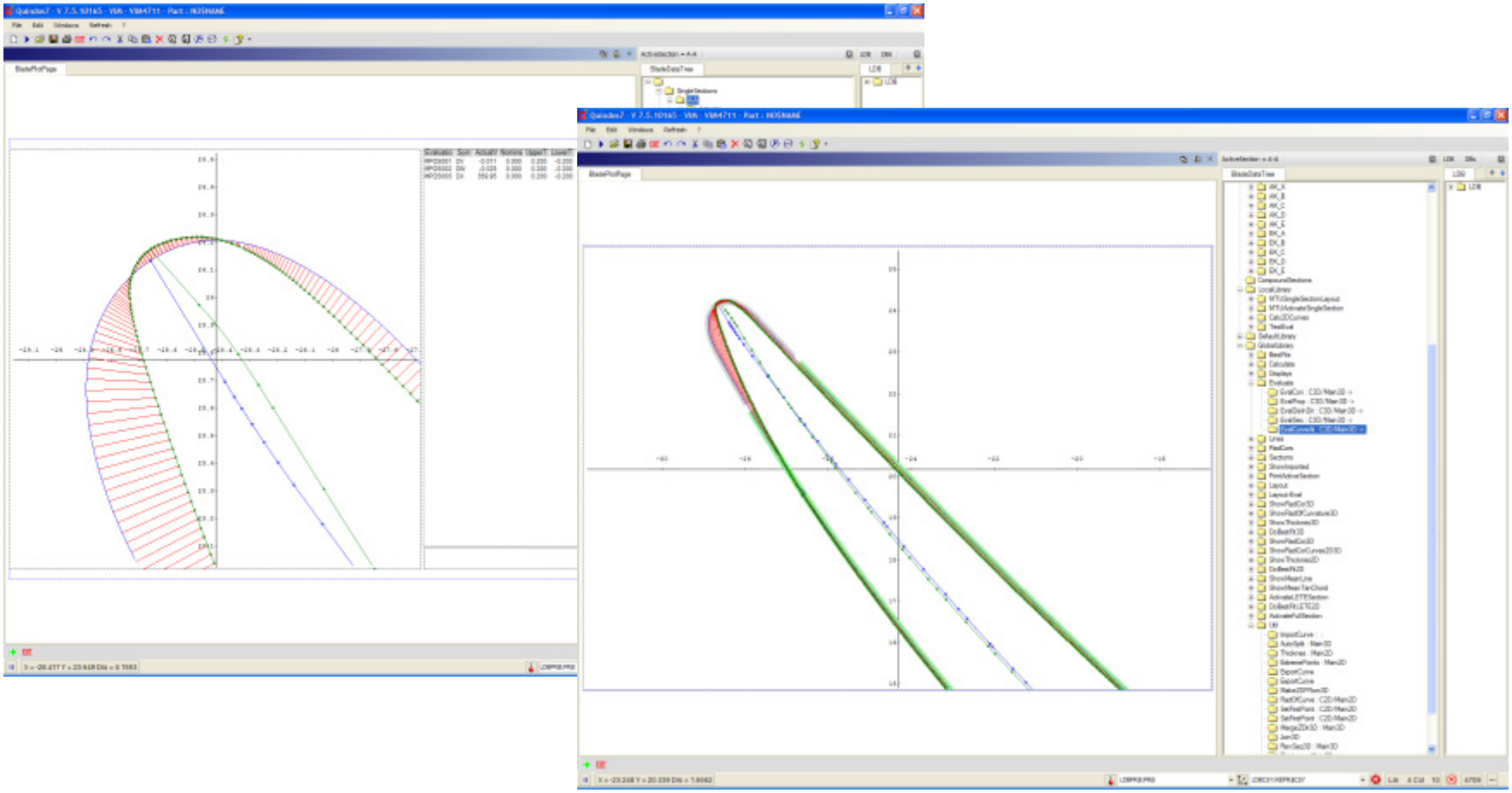
HEXAGON METROLOGY

Ultimate Blade

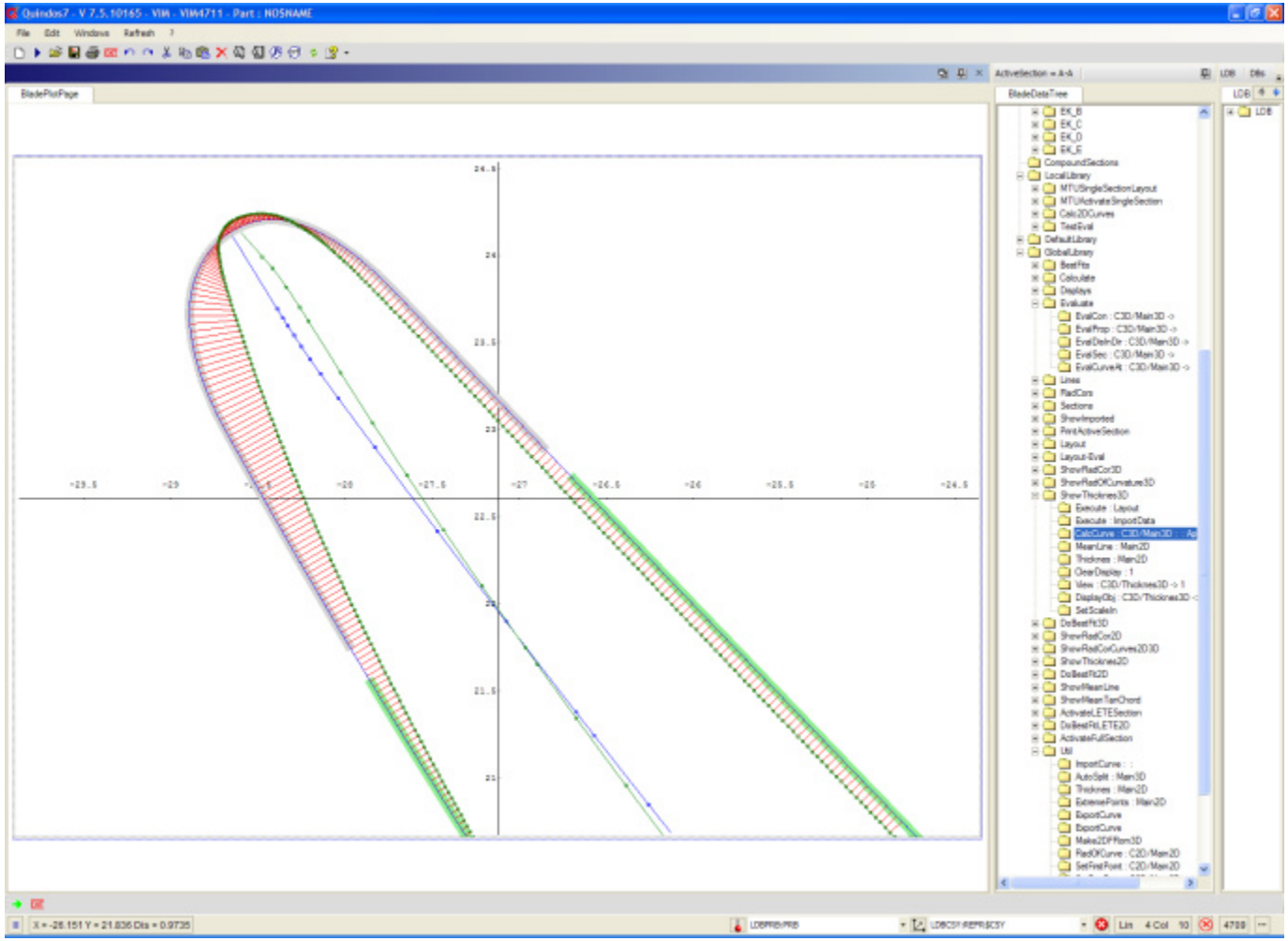
- 2D Visualization and interactive evaluation tool for turbine profiles;
- Parameters can be defined interactive and saved for the CNC mode



Ultimate Blade

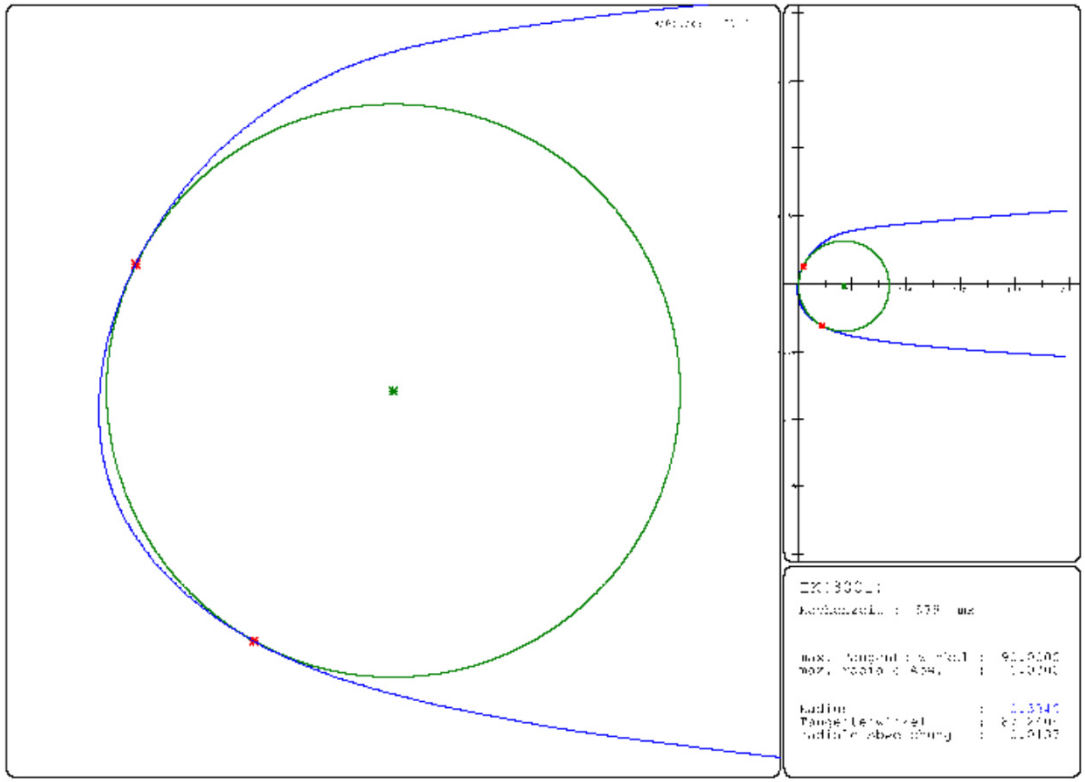


Ultimate Blade

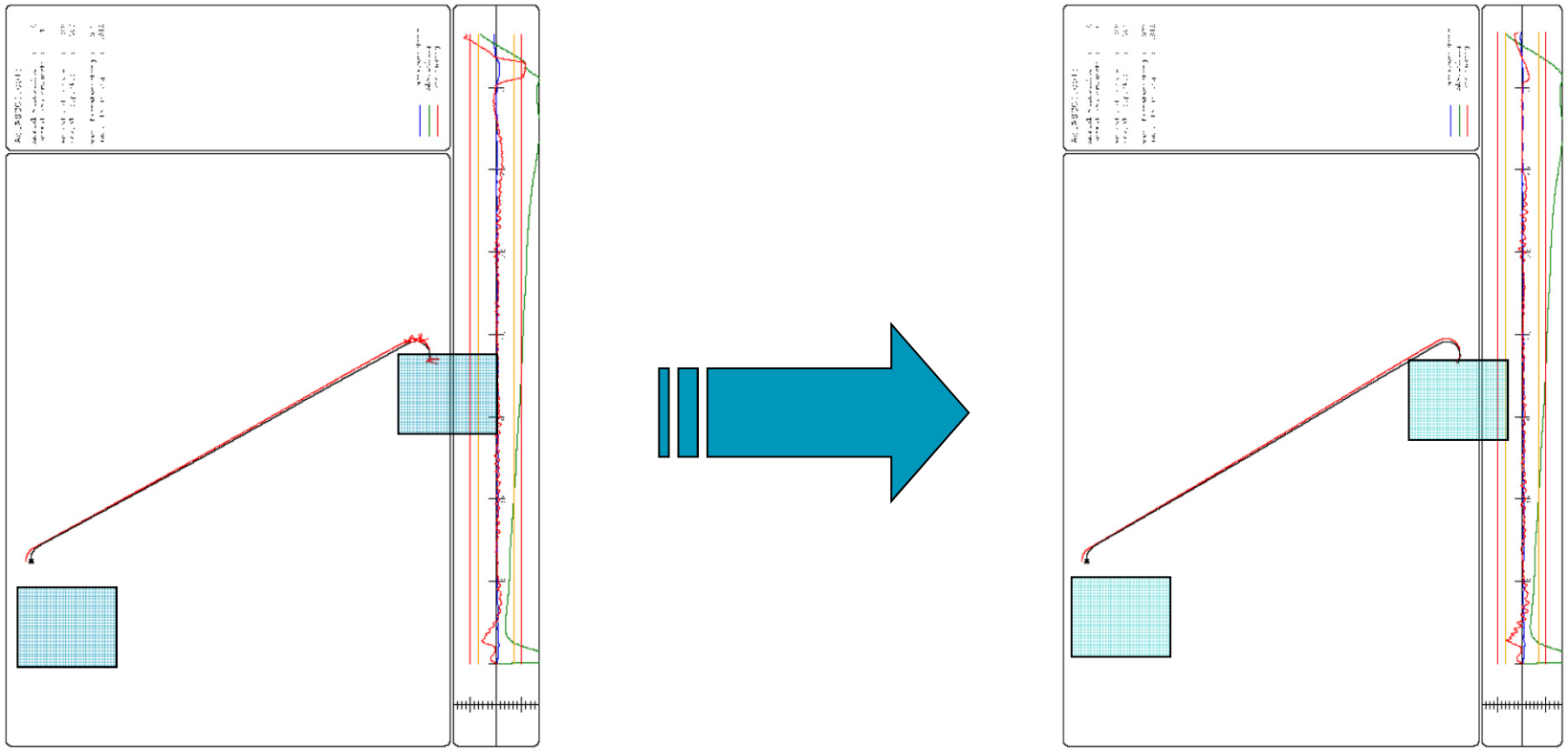


Ultimate Blade

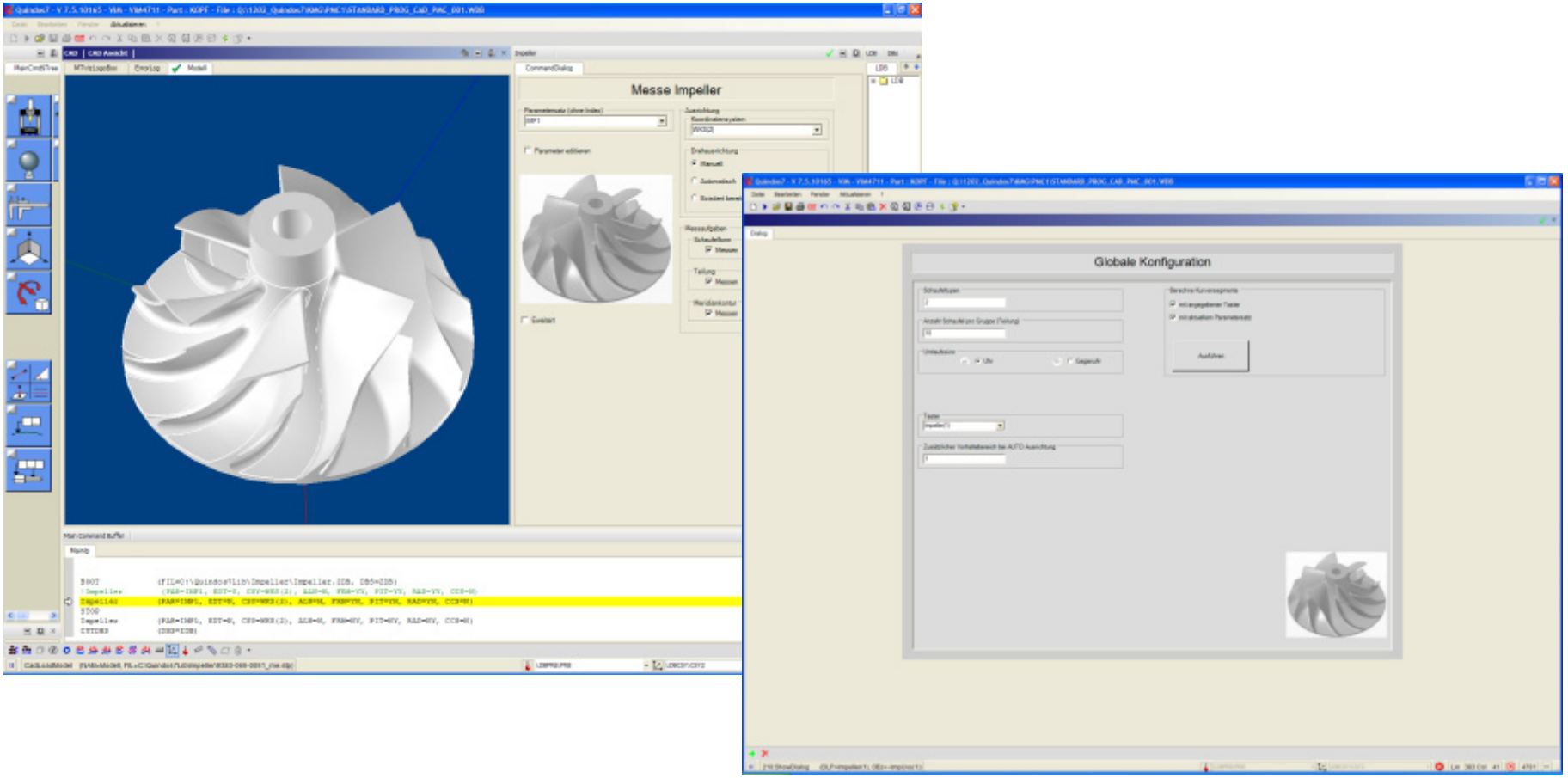
Automatic edge radius recognition.



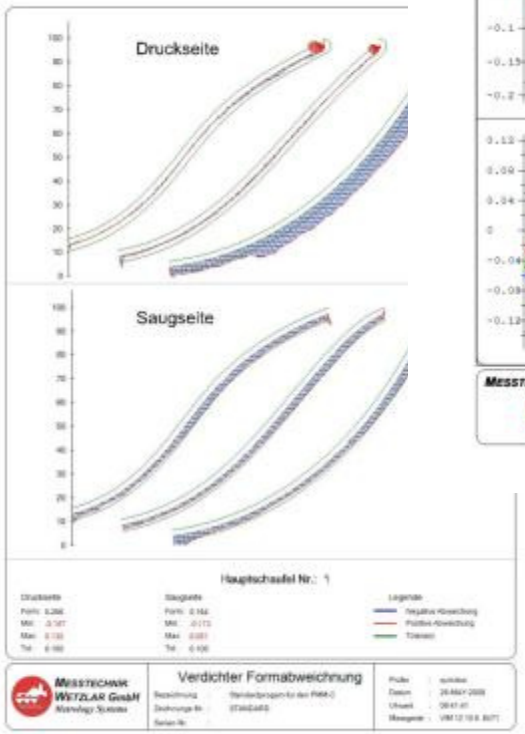
Ultimate Blade– Automatic path correction

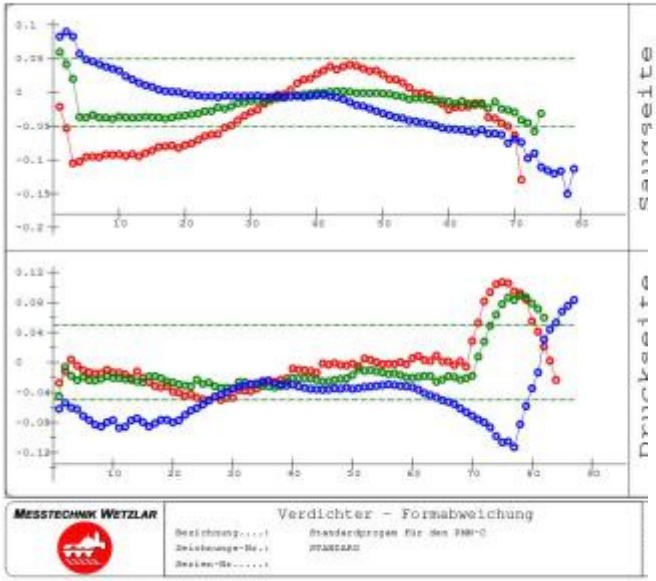


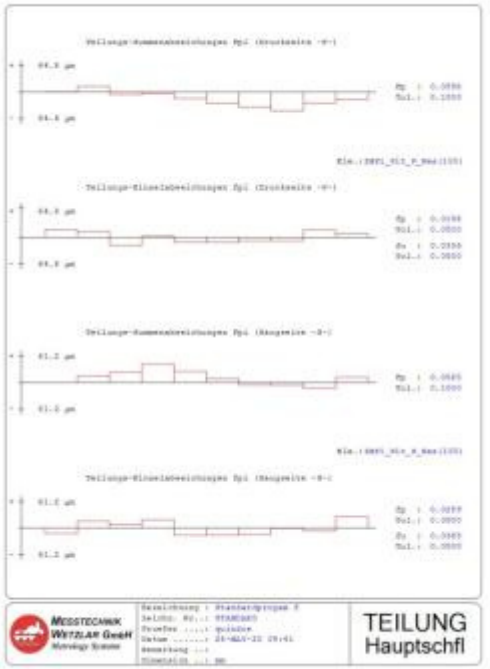
Impeller



Impeller





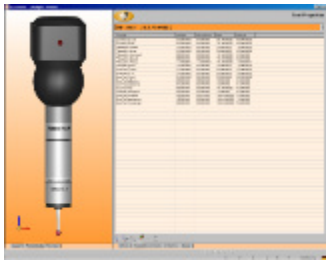


HEXAGON METROLOGY

3rd Party I++DMEServer + client

"IppDME" Protocol (CMM-Interface => industrial Standard)

Quindos 7 is working exclusively with the new standard I++DME protocol to control any brand of CMM. Machines running the Leitz protocol are still compatible due to the I++Server provided with Quindos.

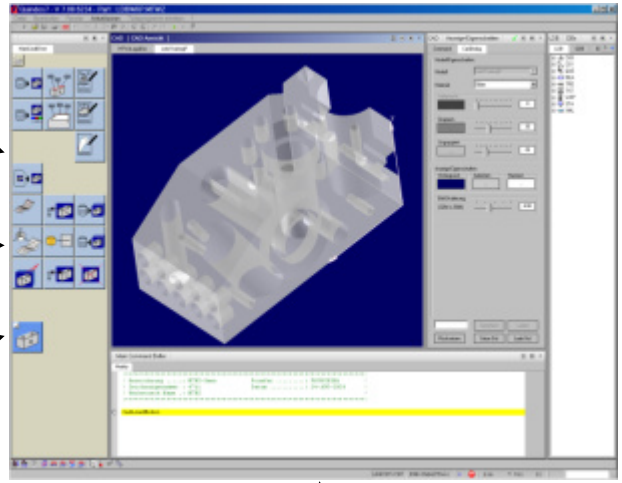


Renishaw UCCServer

ZEISS Server

Wenzel Server

QUINDOS (client)



MORA- / IBB- / IBTL- Server

Q7 PowerTrain & special Options

- **Gearings**
- Cylindrical Gear
- Unknown Gear
- Involute & Lead Master
- Straight Bevel Gear
- Spiral Bevel Gear
- Cylindrical Worm
- Worm Wheel
- Double enveloping Worm
- Sprocket

- **Gear Tools**
- Hob Cutter
- Broach Shells
- Shaver Cutter
- Shaper Cutter

- **Ultimate Blade**
- Blisk & Blade
- Broach for fir tree foot

- **Special Geometries**
- Step Gearings
- Curvic coupling
- Screw Compressor
- Camshaft
- Constant Velocity Joint
- Valve Seats & Guides
- Ovality of Pistons
- Connecting Rods
- Crankshaft
- Abrasive wear
- P3G & P4C Polygon
- Thread / API Thread
- Complementary Cams
- Impeller

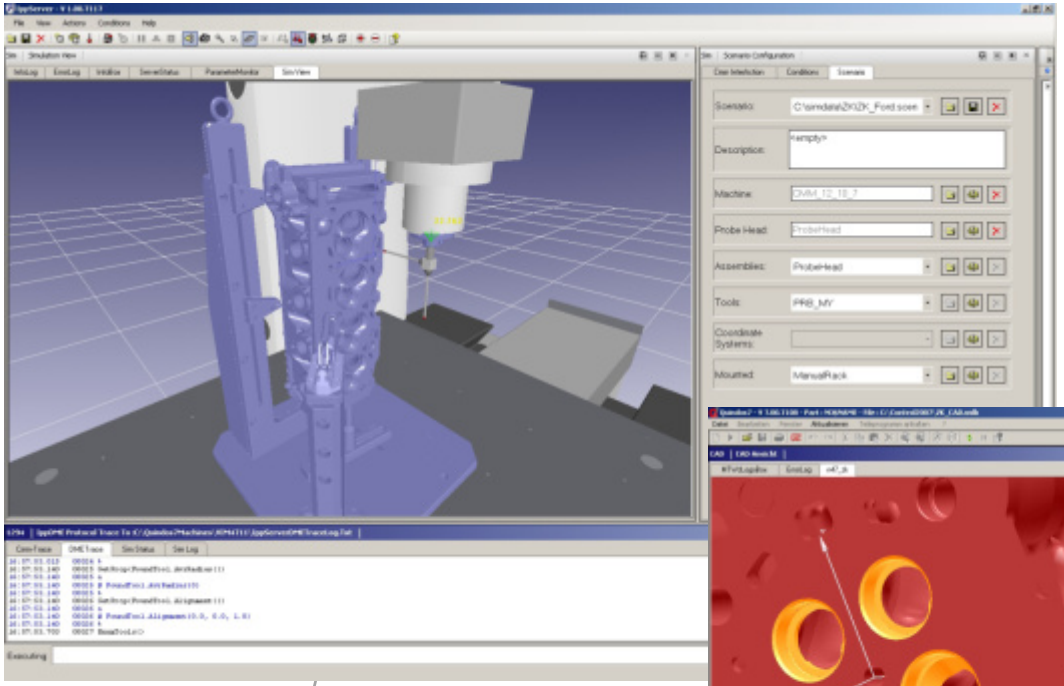
- Feature based Inspection
- Statistic
- CAD Basic & Surfaces
- 2D Gauging
- Centering of Balls in 3D-Contour

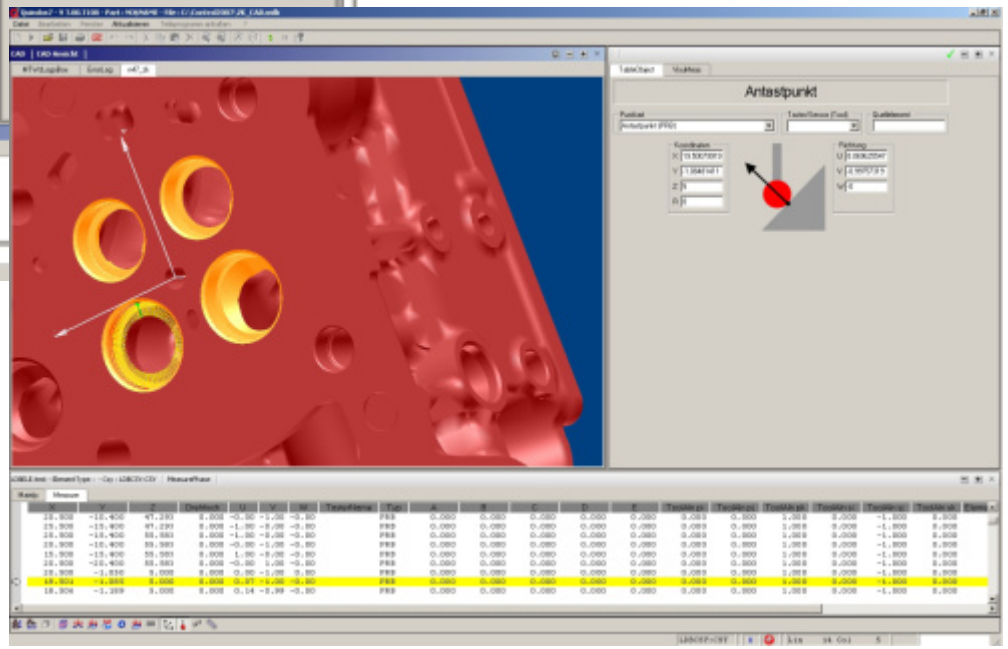
- **CMM verifications**
- **CMM verify (spec. hardware required)**
- **CMM test with ball/bore plates**
- **ISO 10360 -2/3/4/5**

- **Special Interfaces**
- **qs-Stat® interface**
- **PRO-E,CATIAV4, CATIAV5, UG CAD interfaces**
- **FUBIT**

- **Gauges**
- **Ring-Gauge**
- **Plug-Gauge**
- **Snap-Gauge**
- **Automatic Gauge inspection**

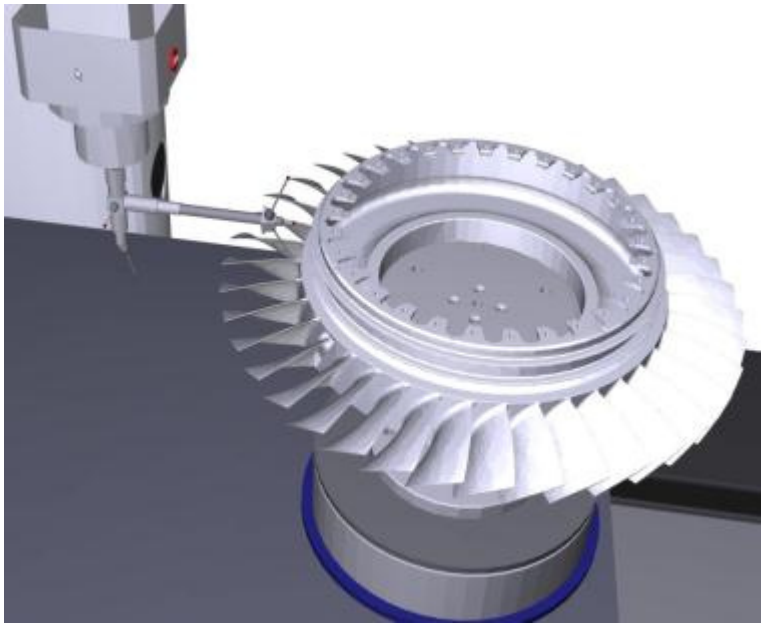
HEXAGON METROLOGY





New: I++ CMM Simulator
real offline programming

I++Simulator



Please click on the image; Adobe Reader 8.0 is required

HEXAGON METROLOGY