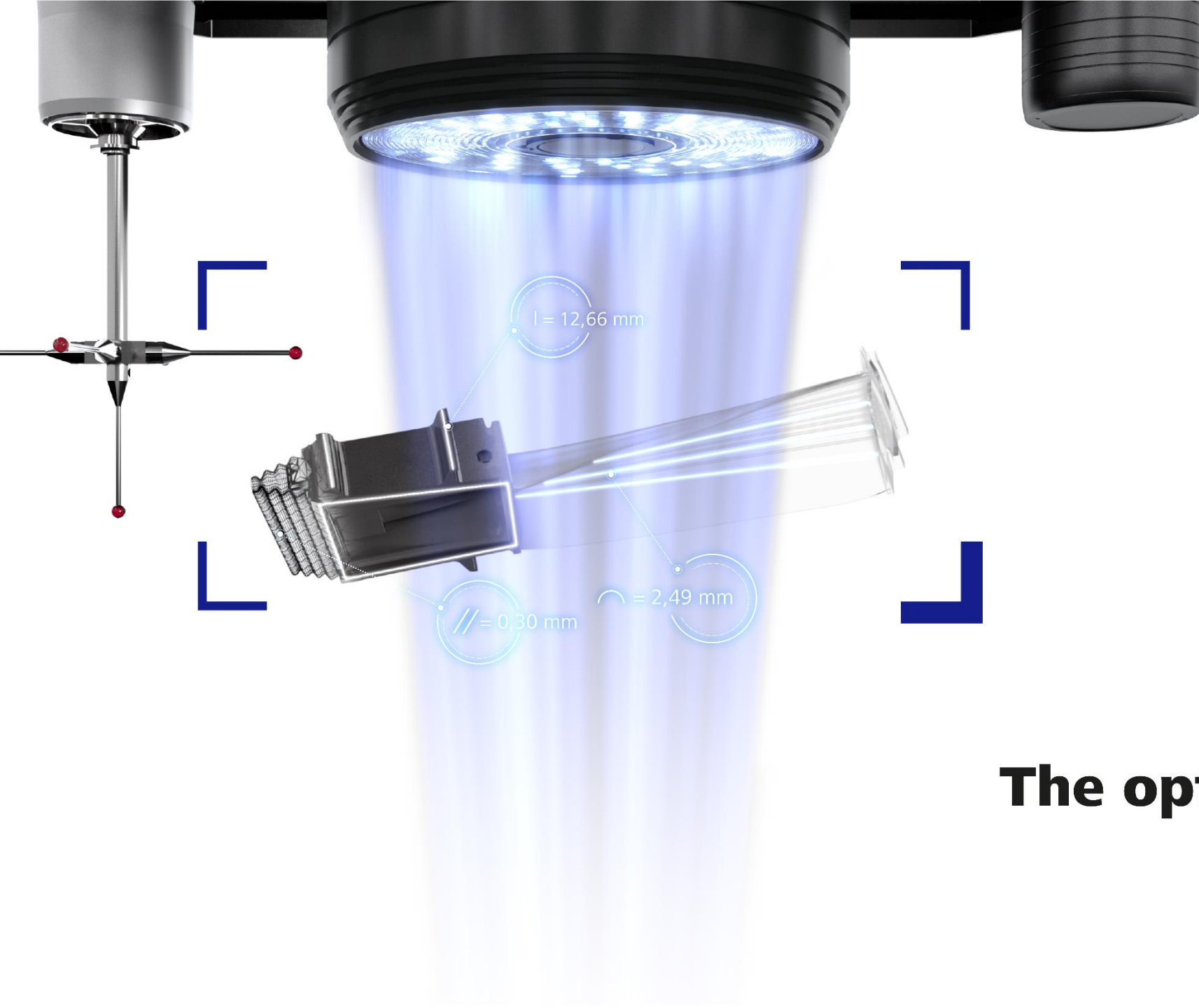




Seeing beyond



**The optical solution with
the right touch**

ZEISS O-INSPECT

ZEISS O-INSPECT

The optical solution with the right touch



The right ZEISS O-INSPECT

01

02

Application versatility

Multisensory equipment

03

04

More productivity with O-INSPECT Accessories

Reasons to buy ZEISS O-INSPECT

05

06

Customer Success Story

01

The right

ZEISS O-INSPECT

ZEISS O-INSPECT

01 | The right ZEISS O-INSPECT for every field of application



ZEISS O-INSPECT 332

Footprint: 12 dm³

Measuring Range: 300 x 200 x 200

MPE E0 (3D) = 2.4 + L / 150



ZEISS O-INSPECT 543

Footprint: 60 dm³

Measuring Range: 500 x 400 x 300

MPE E0 (3D) = 1.9 + L / 250



ZEISS O-INSPECT 863

Footprint: 144 dm³

Measuring Range: 800 x 600 x 300

MPE E0 (3D) = 2.2 + L / 150

ZEISS O-INSPECT 332

01 | The right ZEISS O-INSPECT for every field of application



ZEISS O-INSPECT 332

Footprint: 12 dm³

Measuring Range: 300 x 200 x 200

MPE E0 (3D) = 2.4 + L / 150

Key Features

- Tactile ZEISS VAST XXT Scanning, TL1 or TL3
- Chromatic-confocal white light sensor ZEISS DotScan preparation
- 12x ZEISS Zoom-Optic
- TVA (temperature variability accuracy) 18° - 30°C
- All specifications in according to ISO 10360 (1D, 2D, 3D – tactile and optical)
- ZEISS CALYPSO Software
- Integrated pallet receiving system
- Measuring volume illumination

More online: <https://youtu.be/3-u5EJEIpVE>



ZEISS O-INSPECT 543

01 | The right ZEISS O-INSPECT for every field of application



ZEISS O-INSPECT 543

Footprint: 60 dm³

Measuring Range: 500 x 400 x 300

MPE E0 (3D) = 1.9 + L / 250

Key Features

- Tactile ZEISS VAST XXT Scanning, TL1 or TL3
- Chromatic-confocal white light sensor ZEISS DotScan preparation
- 12x ZEISS Zoom-Optic
- TVA (temperature variability accuracy) 18° - 30°C
- All specifications in according to ISO 10360 (1D, 2D, 3D – tactile and optical)
- ZEISS CALYPSO Software
- 4th-axis scanning rotary table prepared
- Integrated control panel holding rail



ZEISS O-INSPECT 863

01 | The right ZEISS O-INSPECT for every field of application



ZEISS O-INSPECT 863

Footprint: 144 dm³

Measuring Range: 800 x 600 x 300

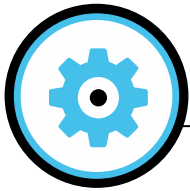
MPE E0 (3D) = 2.2 + L / 150

Key Features

- Tactile ZEISS VAST XXT Scanning, TL1 or TL3
- Chromatic-confocal white light sensor ZEISS DotScan preparation
- 12x ZEISS Zoom-Optic
- TVA (temperature variability accuracy) 18° - 30°C
- All specifications in according to ISO 10360 (1D, 2D, 3D – tactile and optical)
- ZEISS CALYPSO Software
- 4th-axis scanning rotary table prepared
- Integrated control panel holding rail



02 Application versatility



Industry in General

- ✓ Small housings
- ✓ CNC machined parts
- ✓ Gears
- ✓ Molded parts

Electronic

- ✓ Connectors
- ✓ PCB boards

Plastic

- ✓ Housings
- ✓ Connectors
- ✓ nCPAP generator

Watch

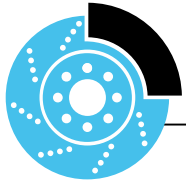
- ✓ Micro parts
- ✓ Accessories



Aerospace

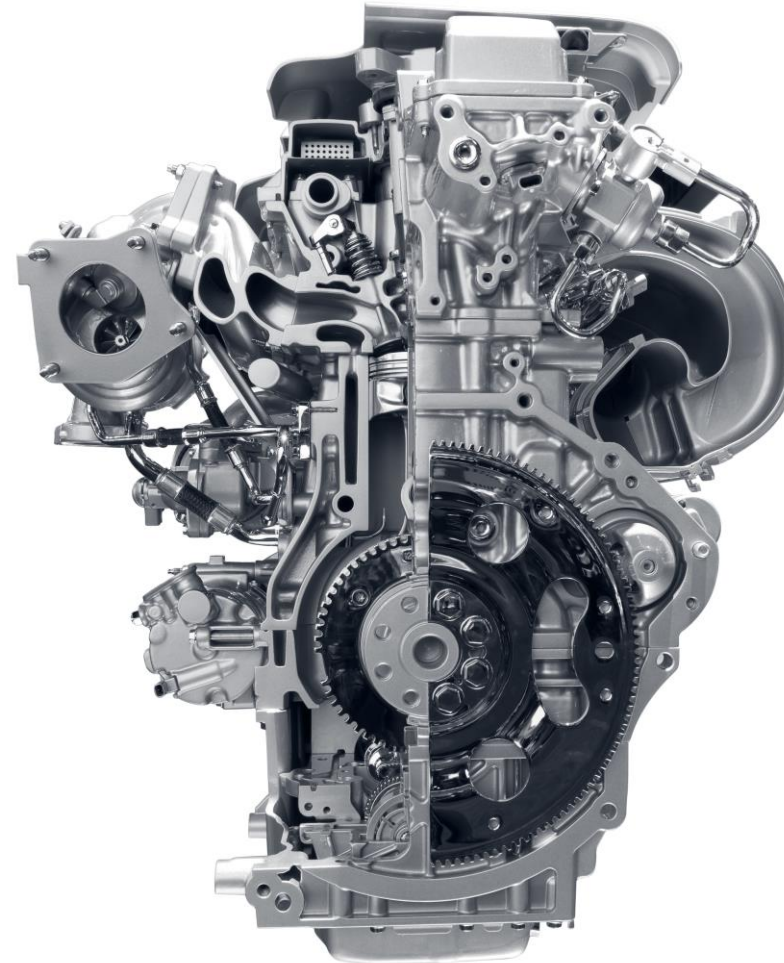
- ✓ Turbine blade:
- ✓ Impeller





Automotive

- ✓ Gear wheels
- ✓ Valves
- ✓ Connection rods
- ✓ Crank shafts





Medical

- ✓ nCPAP generator
- ✓ Knee implants
- ✓ Tooth implant
- ✓ Screw
- ✓ Insert-cup
- ✓ Bone plate



03

**Multisensory
equipment**

ZEISS O-INSPECT

03 | 3D-measurements with the multisensory equipment



01

Tactile ZEISS VAST XXT
Scanning Sensor

02

Optical ZEISS Camera Sensor
12x Zoom-Optic

03

ZEISS DotScan
Chromatic-confocal
white light sensor

Tactile Sensor (3D)



- Most flexible sensor
- Independent of surface reflection
- TL1 or TL3

Camera Sensor (2D)

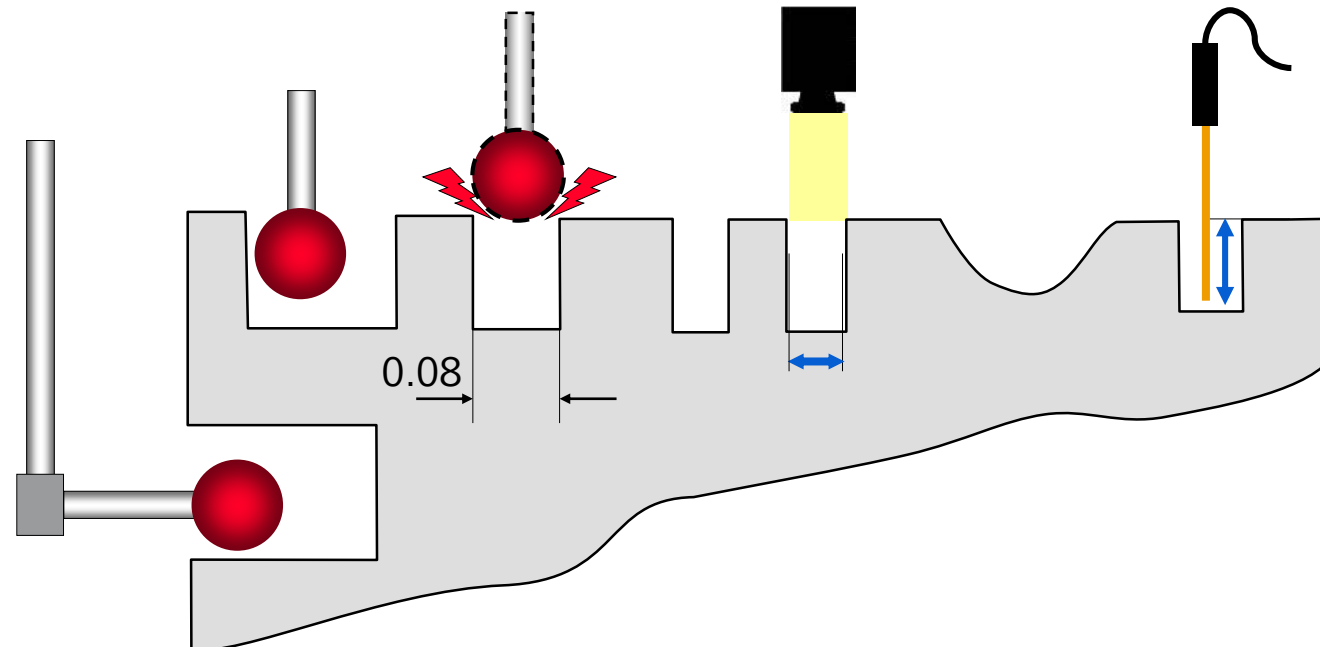


- Objektiv für ViScan Discovery.V12 plus Ringlight
- 2D measurements in camera plane
- Acquisition of several features in one camera view
- Autofocus dependent on surface reflection
- 12x ZEISS Zoom-Optic

Confocal Sensor (1D)

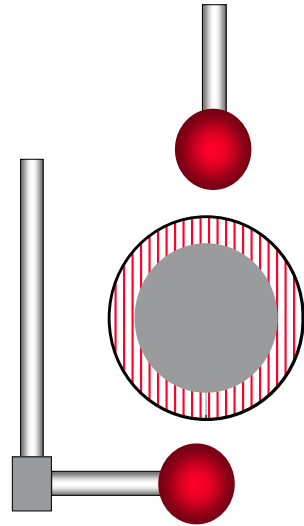


- Distance measurements for tight structures
- White light sensor
- Preparation as default



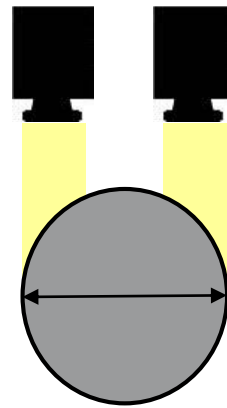
03 | Important Difference between tactile and optical sensors

Tactile sensor: 3D



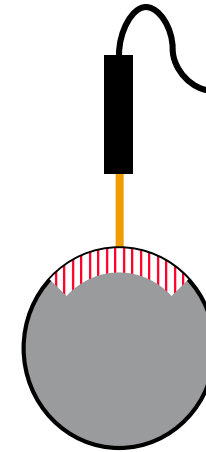
- Full information in all directions
- Surface reflection is not important
- Restricted in ruby-size

Camera: 2D



- Information in X and Y
- Reaches all features
- Rotation of workpiece might be needed

White light sensor: 1D



- Only information in Z-direction
- Reaches all features



Tactile scanning sensor VAST XXT

- Scanning, thousands of points
- Lowest probing forces, one-digit mN (f.e. 9 mN = 0.9177 g)
- Smallest stylies, min. radii 40 µm (TL1)
- Difference TL1 or TL3

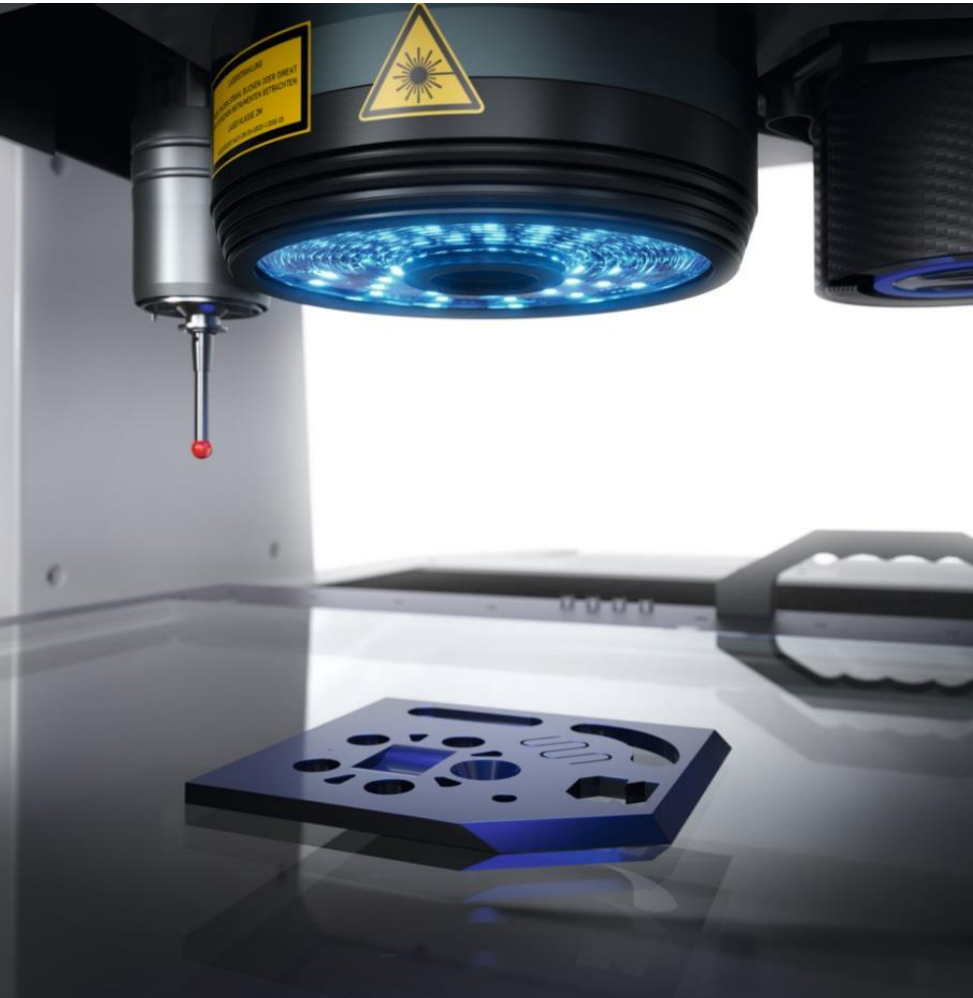
If you have to measure larger parts where you need longer styli

Choose TL3

If you have to measure small parts or parts with a sensitive surface (f.e. lenses, ...) or smallest features (holes f.e. < Ø 100 µm)

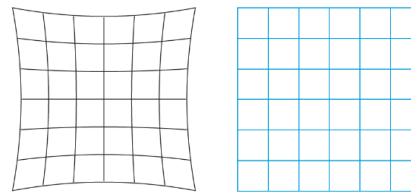
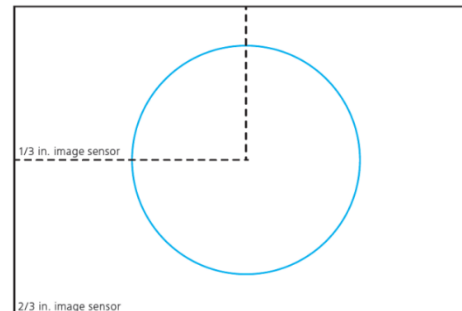
Choose TL1

If you need stylies between 80 µm – 250 µm, please order an additional one day application support



Optical ZEISS Camera Sensor

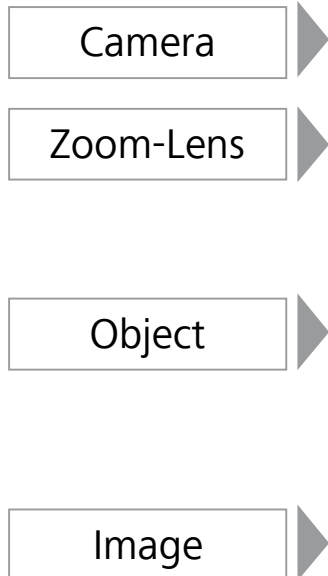
- 12x-times magnification
- Designed for 1/1.2"-inch camera chips, lowest optical distortion in its class
- Three uplights in red and blue (Coax, inner and outer ringlights)
- Magnetic interface for optional optical filters
- Telecentric Backlight
- Navigation-Laser



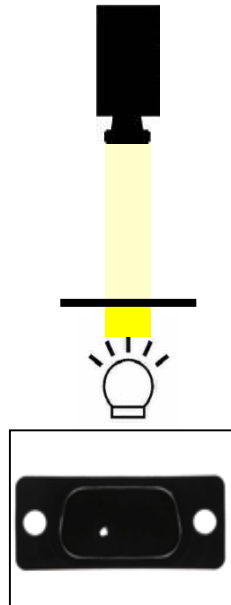
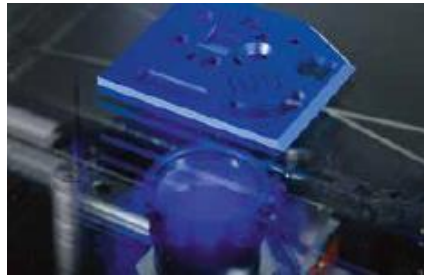
Imaging probing error: MPE PFV2D = 1.2µm

- Compared to standard lenses, it provides a much larger field of view (FoV)
- The result: reduced measuring time and higher accuracy

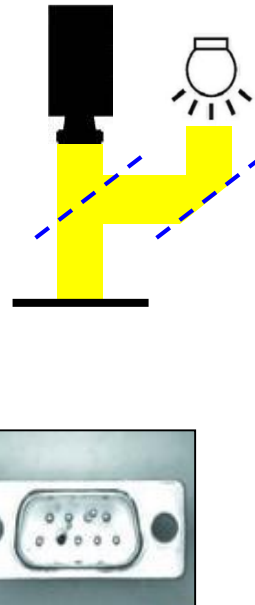
- Compared to standard lenses, it provides very good image definition also in the peripheral zones
- The result: excellent accuracy in the whole Field of View



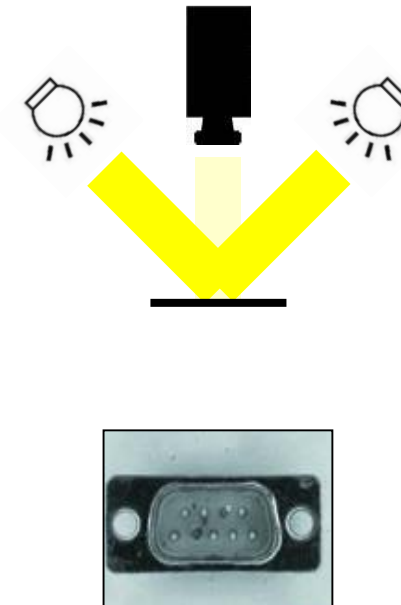
Back Light
Transmitted Light



Coaxial Up light
Reflected Light

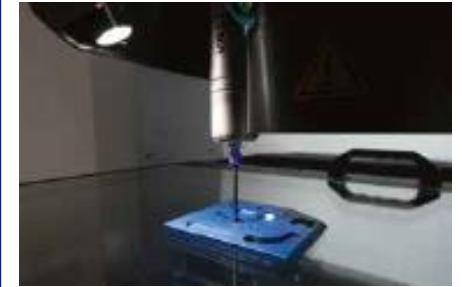


Ringlight (Up light)
Reflected Light



Measuring volume illumination (Option)

- For an optimum of views



Coaxial laser pointer

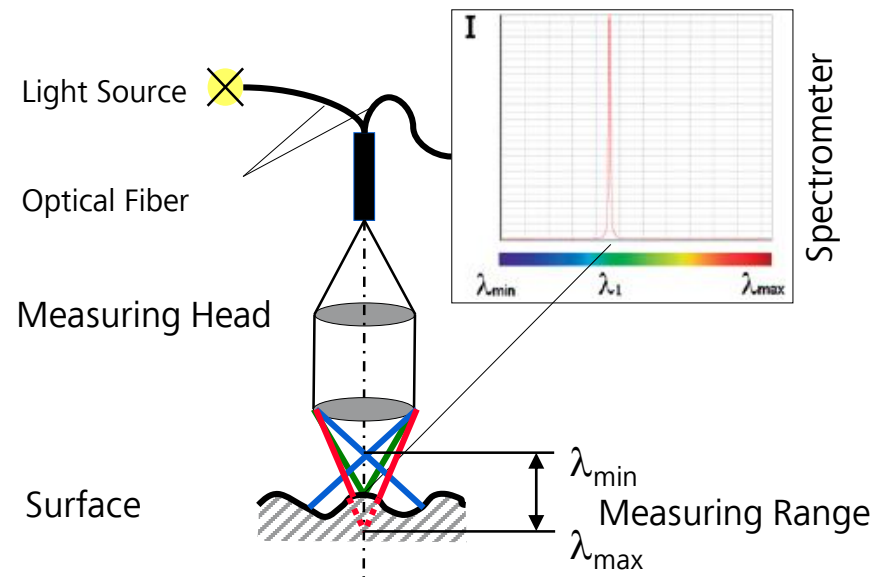
- To find quick and easy smallest features





ZEISS DotScan White light sensor

- Contactless
- Fast scanning unknown contour with intelligent auto correction - active scanning
- 4-axis scanning with rotary table
- Measurement of any surface and material (transparent, mirrored etc.)
- Manual exchange of different DotScans



→ Distance calculation by interpretation of wave length signals

04 More productivity with O-INSPECT Accessories

Accelerate all stages of measuring

Precision meets Acceleration



1. Fast and precise preparation

FixAssist XXT and mounting tools help to align probe systems faster and more precisely.



2. Flexible and efficient set-up

Double throughput and efficiently clamping with pallets and universal fixtures.



3. Independent accuracy checks

Reference spheres and calibration artifacts helps you to check the measuring accuracy on your own.



4. Exact and reliable measurement

XXT-stylus systems and DotScan help to shorten and efficiently increase non-productive times.



5. Optimal storage

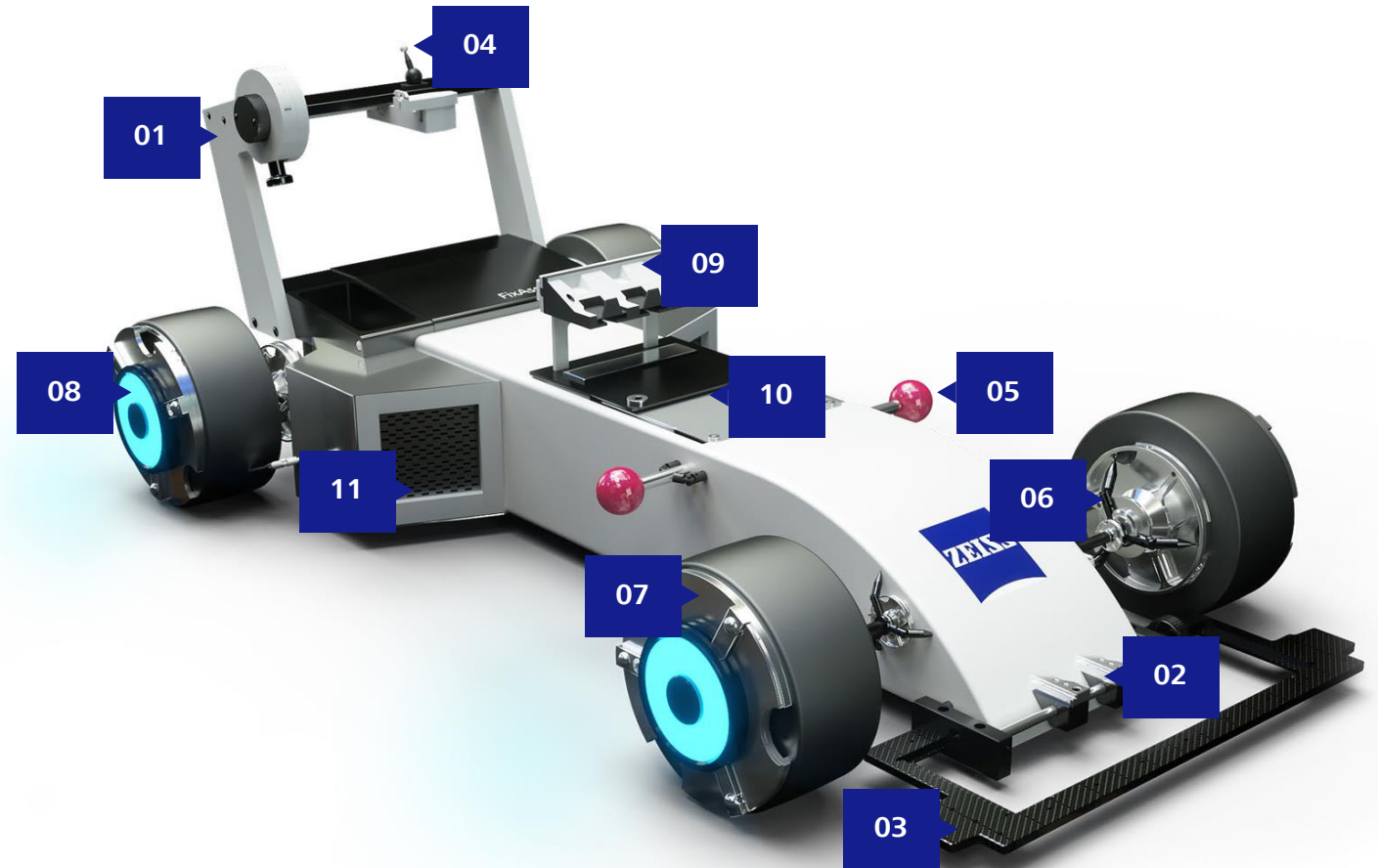
Multi Sensor Rack, ProMax, MSC and pallet cabinet support the measuring process without interruptions.

Put your productivity into the fast lane.

Our wide range of premium ZEISS accessories



- 01** ZEISS FixAssist XXT
- 02** ZEISS OmniFix
- 03** ZEISS ZEISS Pallets
- 04** ZEISS Reference spheres
- 05** ZEISS Styli
- 06** ZEISS Extensions
- 07** ZEISS Adapter plates
- 08** ZEISS DotScan
- 09** ZEISS Multi Sensor Rack
- 10** ZEISS ProMax
- 11** ZEISS Multi Sensor Cabinet





Accelerate preparation

with ZEISS FixAssist XXT and mounting tools



01

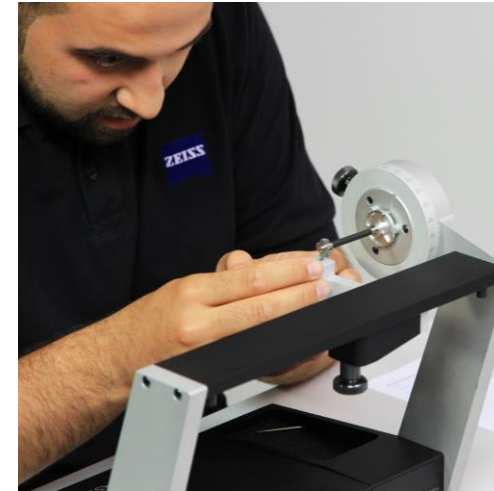
ZEISS FixAssist XXT

Simplifies and improves the precise adjustment of the sensor systems for accurate recording of all characteristics being measured.

[Check out in the Shop](#)

Benefits:

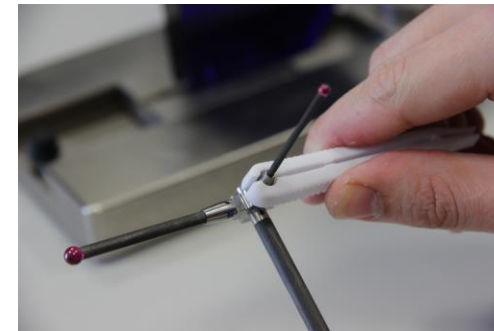
- No machine utilization for prealignment
- Prevents damage to styli
- Fast, reproducible stylus assembly
- High level of reliability through optimally adjusted styli

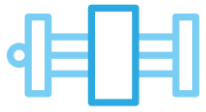


ZEISS stylus assembly pliers

Shortens preparation time and facilitates secure, easy assembly of the most sensitive components with the aid of the ZEISS sensor assembly pliers.

[Check out in the Shop](#)





Accelerate set-up with ZEISS OMEGA pallets and ZEISS OmniFix



02

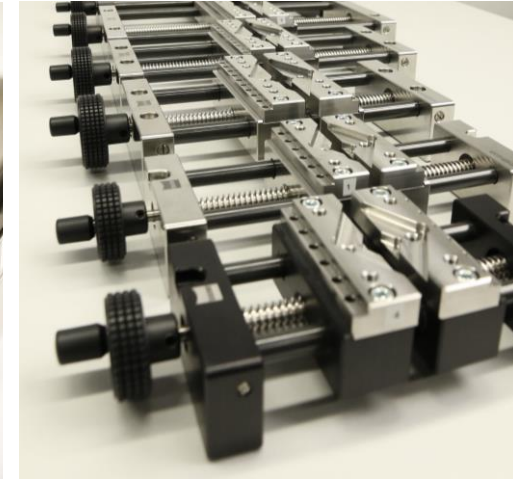
ZEISS OmniFix

Universal clamping tools offer an optimal combination of accessibility and flexibility for a wide range of part geometries.

[Check out in the Shop](#)

Benefits:

- Black anodized aluminum for fewer reflections
- For mounting the vise onto a ZEISS OMEGA pallet
- Optimum Z axis accessibility
- Vise can also be used as a center cradle thanks to special clamps available as accessories



03

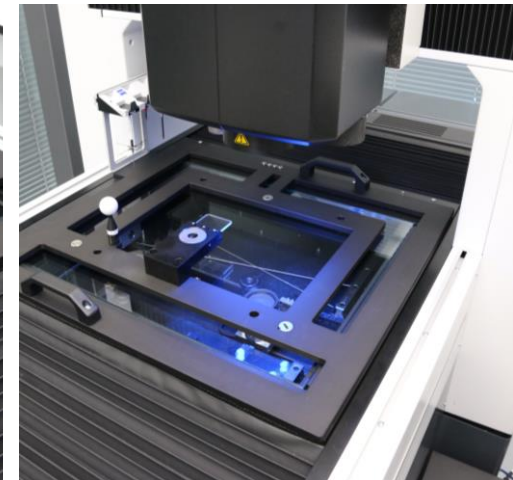
ZEISS OMEGA pallets

Significantly increase the productivity of a measuring device and considerably shorten set-up time, thus minimizing downtime.

[Check out in the Shop](#)

Benefits:

- Fixturing of the workpiece apart from the machine - this saves valuable machine capacity for the actual measuring
- Change pallets in a twinkling - reduce downtime additionally
- The workpiece is easily positioned using the 3-point-bearing for a repeatable measurement





Accelerate calibration

with ZEISS reference spheres and ZEISS calibration artifacts



04

ZEISS Reference spheres

ensure precise measuring results for all available sensors on a lasting basis.

[Check out in the Shop](#)

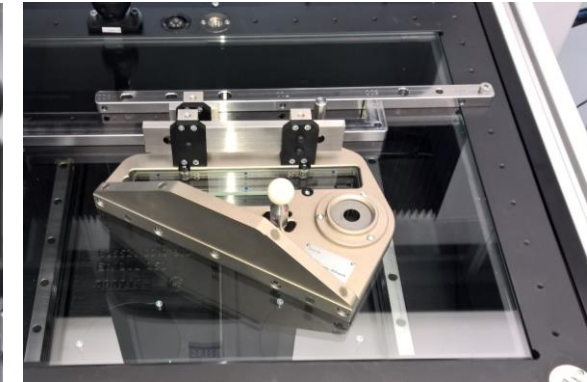
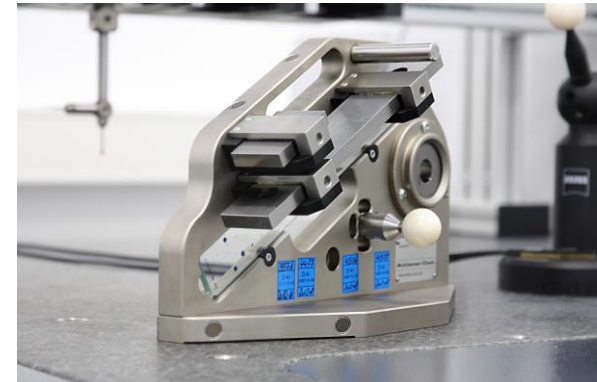


ZEISS Calibration artifacts

check and ensure the precision of the CMM.

[Check out in the Shop](#)

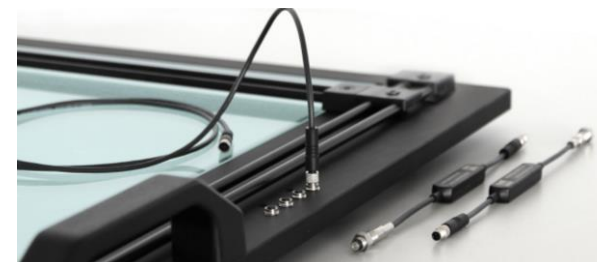
- Probing error of the probe system
- Scanning error of the probe system
- Probing error and length measurement error are inspected using both contact and optical methods.

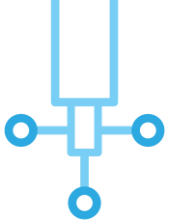


ZEISS Temperature sensors

precisely record the workpiece temperature to ensure accurate, optimal measuring results.

[Check out in the Shop](#)





Accelerate measurement

with ZEISS Styli, extensions, connecting elements, adapter plates and DotScan



05

ZEISS XXT stylus system

Contains of rigid styli, connecting elements, extensions and adapter plates. All of them specially developed for ZEISS VAST XXT probe heads.

[Check out in the Shop](#)

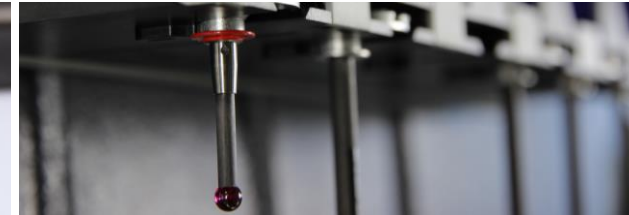


06

ZEISS XXT stylus extension

Enable the construction of long stylus systems and the measurement of difficult to access features on workpieces.

[Check out in the Shop](#)



07

ZEISS adapter plates

Ensure optimum functionality within the measuring process. Only original ZEISS adapter plates are equipped with an ID-Chip that is recognized by the CMM.

[Check out in the Shop](#)



08

ZEISS DotScan

can be used flexibly, even for thickness measurements of transparent surfaces or with four axis scanning.

[Check out in the Shop](#)





Accelerate storage

with ZEISS Multi Sensor Rack, ZEISS Multi Sensor Cabinet and ZEISS ProMax



09

ZEISS Multi Sensor Rack

Accelerate measuring processes via automatic stylus system change.

[Check out in the Shop](#)

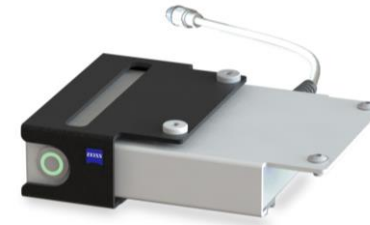


10

ZEISS ProMax

Makes optimal use of the available measuring range and prevents collisions.

[Check out in the Shop](#)



11

ZEISS Multi Sensor Cabinet

Organizes parts in the measuring room and protects your stylus systems.

[Check out in the Shop](#)



05

**Reasons to Buy
ZEISS O-INSPECT**

Flexibility

Quick and Precise

True 3D measurements

Tactile and optical

Multisensory

ZEISS CALYPSO

Optimal optical contrast

High image definition

#1

**ZEISS CALYPSO
3D-CAD-Software**

ZEISS CALYPSO

enables fast programming



Programming and working with multisensorics made easy

Technical explanation

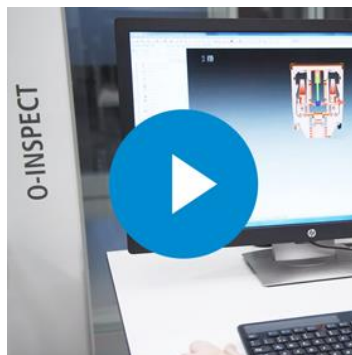
With ZEISS CALYPSO, camera and CAD models can be displayed superimposed and possible deviations (ACTUAL to TARGET) can be seen quickly.

The ZEISS CALYPSO curve option is available as standard, which is extremely important for measuring plastic parts. Thanks to an updated software solution in ZEISS CALYPSO, measurement is up to 6 times faster than before. In addition, the user is able to program faster and several component features can be measured accurately at the same time.

Example



<https://youtu.be/okcYpQ-bVtU>



<https://youtu.be/nGeuGWrhleY>

Benefit for customer

- Simply click with the mouse to select an inspection feature and the appropriate sensor
- Correct allocation and easy interpretation of measurement results due to “actual and target” comparison
- In addition, compatibility is guaranteed across all ZEISS coordinate measuring machines.

#2 Quick and Precise 3D-Measurements

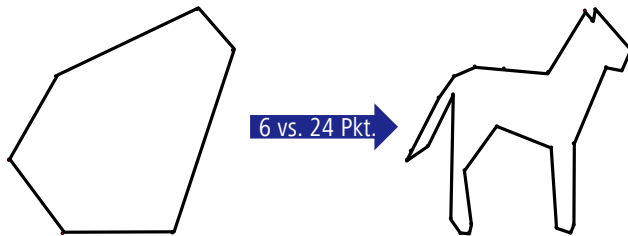
Quick and Precise 3D-Measurements by Scanning



Scanningtechnology

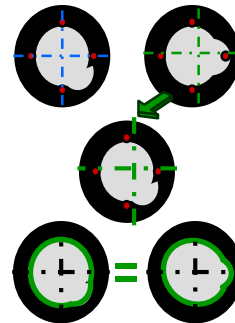
Technical explanation

canning technology means that a large number of points are recorded. Capturing more points gives greater confidence and better quality in the measurement of properties.



Example

Single point measurements may detect the deviation within an element, but this is not always the case. Scanning enables a much higher density of measurement data, where deviations of an element are always detected.



Benefit for customer

- In a comparable period of time, one obtains a more meaningful data quality for the measurement object.
- The measurement results are more reliable and repeatable because the measurement errors caused by single point measurements are automatically eliminated.
- The next step in your quality management.

Competitive environment



All competitors use only passive scanning technology. They are not in a position to offer an actively measuring sensor head such as VAST from ZEISS. In the field of passive scanning sensors, our competitors use almost the same technology as we do.

Quick and Precise

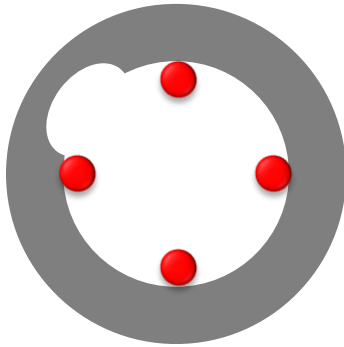
3D-Measurements by Scanning



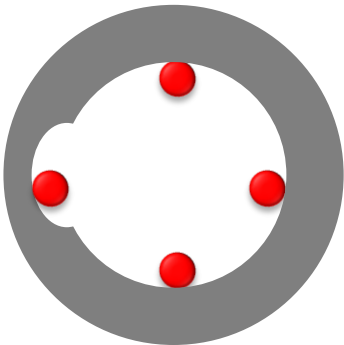
Scanningtechnology – Example

Measurement of a circle with single points in comparison to scanning technology

Single points



D = 13,85 mm

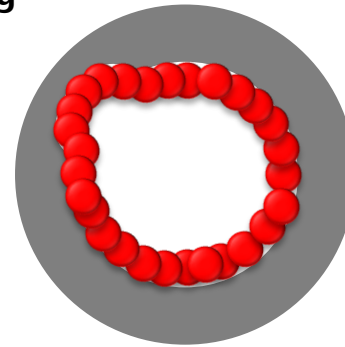


D = 14,25 mm



Same component, but different results

Scanning



D = 14,10 mm



D = 14,10 mm



Same component, same results

Quick and Precise 3D-Measurements by Scanning



Scanningtechnology – Application example

Quality inspection of the MCC (pen circle) against the MIC (enveloping circle) for a bearing shell

Bore → MIC

Shaft → MCC

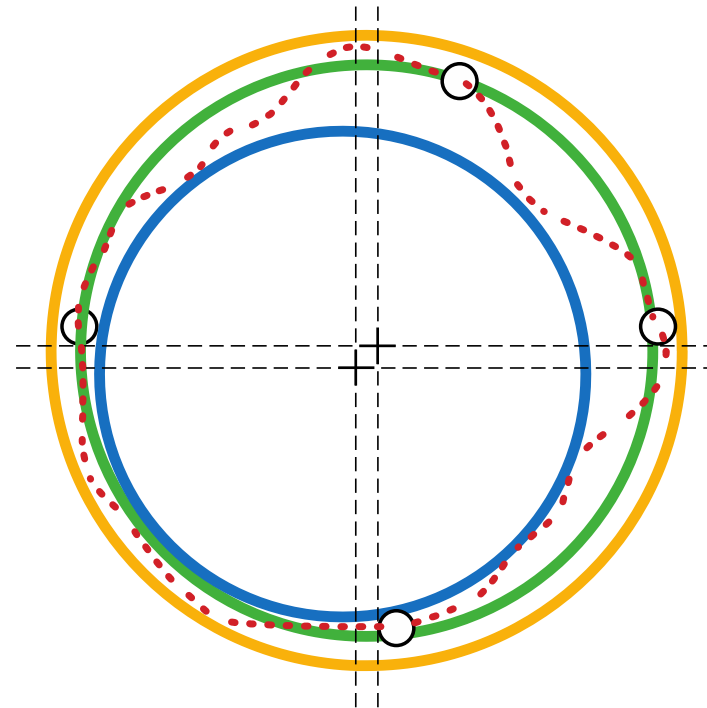
Issue

For quality assurance, the property appears to be good.
Nevertheless, there are problems with the assembly.

Technical explanation

With the single point measurement with Gaussian evaluation, the minimum points are compensated.

Scanning enables the complete acquisition and thus a function-oriented evaluation of the tested properties. All the minimum and maximum points are detected so that the shaft fits into the bore.



- Minimum circumscribed circle determined using scanning values
- Compensating circle calculated from 4 single points
- Maximum inscribed circle determined using scanning values
- Form evaluation
- Single point (4-point measuring)
- Different center point coordinates for minimum circumscribed/maximum inscribed circle



Security that the shaft fits into the bore

#3 Temperature Variable Accuracy

Temperature Variable Accuracy for precise measurement



True 3D measurements with additional Temperature Variable Accuracy (TVA)

Technical explanation

The glass ceramic scale is characterized by the fact that it is practically expansion-free in a wide temperature range.

Since thermal expansion of the guides and portal cannot be completely avoided by design, the scales are mounted floating on an oil film.

Example

Expansion coefficient in (Kelvin/meter)

Glass ceramics	0,2 – 0,4 μm
Glass (Competitor C)	8,5 μm
Steel (Competitor A)	10 μm

Benefit for customer

- Adjustment of the scales on the carrier material, glass ceramic scales with almost no thermal expansion, no temperature sensors required on the scale (unique in this class)
- For precise measurements from 18°C to 30°C, the defined accuracies (1D, 2D, 3D) in the entire measuring volume are guaranteed.

Competitive environment



Competitors A & C attach the scales directly to the guides
Competitor A uses metallurgy, a steel scale where temperature compensation is required.
ZEISS uses glass ceramic scales with extremely low thermal expansion.

#4 Multisensoric – Optical and tactile

Multisensoric – Optical and tactile



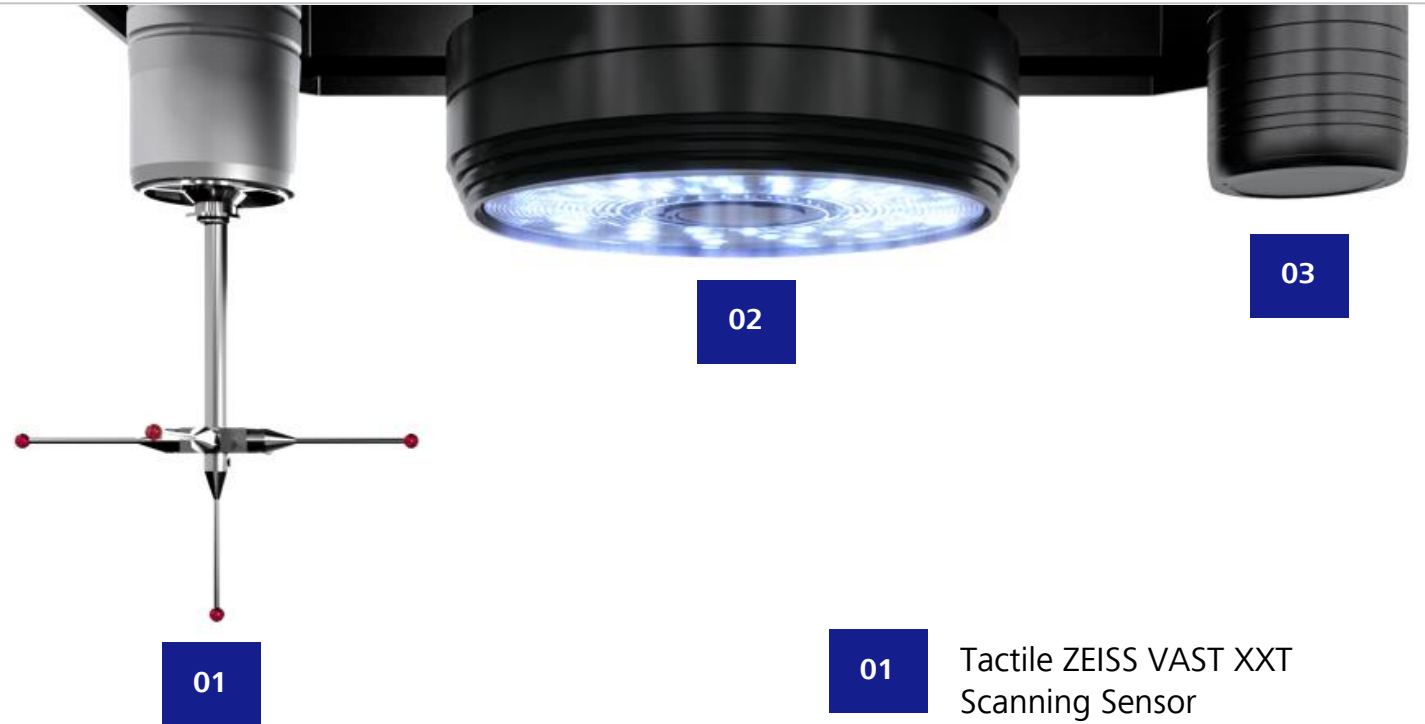
Switching from optical to tactile measurement

Quick and easy without changing sensors or programming effort. Switching to the other sensor needs only fractions of a second and makes a sensor change redundant.

In addition, fix integrated sensors guarantee higher accuracy.

The benefits of multi-sensors

A multi-sensor machine like ZEISS O-INSPECT, which combines tactile and camera-based sensors, might be the solution, if you increasingly reach the limits of what's possible with pure tactile measurement.



- 01 Tactile ZEISS VAST XXT Scanning Sensor
- 02 Optical ZEISS Camera Sensor 12x Zoom-Optic
- 03 ZEISS DotScan Chromatic-confocal white light sensor

**#5 Maximum of
productivity**

Flexible allrounder with maximum of productivity



Three-point pallet holder with temperature interface

Technical explanation

Tactile and optical metrology covers a wide range of parts. Maximum productivity and flexibility are possible with an integrated pallet receiving system with workpiece temperature interface (5/4/3, 8/6/3 only).

With the optional pallet systems and devices for ZEISS O-INSPECT, you gain both time and safety. A special feature: The temperature of the workpieces on a pallet is automatically recorded after up to four sensors have been placed on it and used for temperature compensation.

Example

The user loads a pallet outside the measuring range and prepares the next measurement. In the case of integrated workpiece temperature sensors, these are automatically contacted when the pallet is loaded. When the loaded pallet is inserted into the device, it is read out and transferred to the measuring software.



Benefit for customer

- Shorter set-up times
- No machine downtime
- No incorrect measurements due to temperature influences

Competitive environment



Competitors usually use screw-on adapters to use fixtures that introduce additional uncertainties into the system and reduce the measurement height in Z. Furthermore, automatic temperature compensation cannot be performed.

#6 High image definition

ZEISS Discovery.V12

Large visual field & high image definition



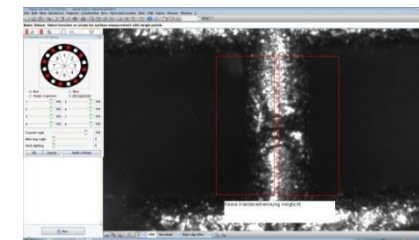
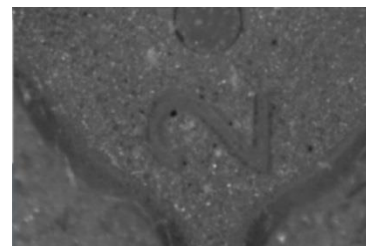
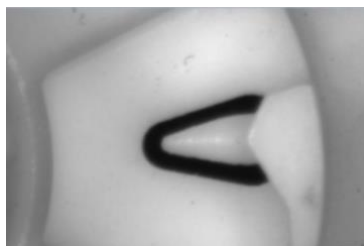
Technical explanation

Compared to standard lenses, ZEISS Discovery.V12 provides a 4x larger field of view and very good image definition, even in the peripheral zones. The result: Excellent accuracy and a significant reduction in measuring time.

The O-INSPECT HR 160 and HR 240 with an adapted lens for ViScan Discovery.V12 offer the possibility of an even higher optical resolution. The use of alternative sensor units does not only provide a 1.6x or 2.4x higher optical resolution, but also allows a larger working distance between camera and component. This also considerably extends the metrological spectrum.

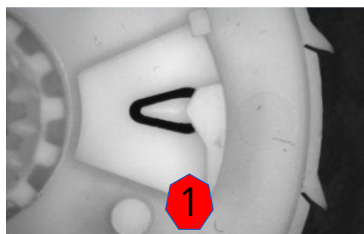
- New GigE CMOS-Camera, ~ 2,4 MegaPixel
- Higher throughput, shorter measurement time
- Enhanced edge detection
- **0,5x - 6,3x Zoom** --> for a 24" inch screen **ca. 25 times – 305 times** magnification

Competitor
1/3"inch Cam



No edge
detection
possible

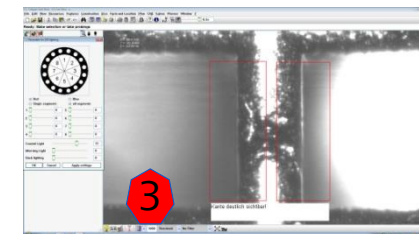
O-INSPECT
ViSCAN III GigE
1/1.2"inch
Cam



Tripled field of
vision



More details visible



Improved
Light sensitivity

#7 **Optimal optical contrast**

Optimal optical contrast and future prepared

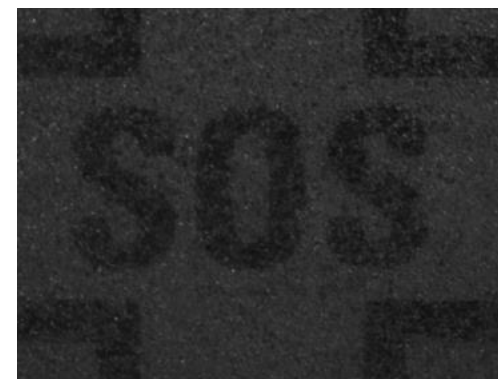
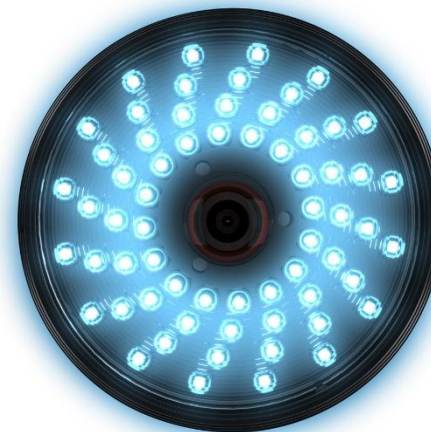
A high-contrast image is required for precise results. With outer and inner ringlight as well as integrated coaxial reflected light in red and blue and transmitted light, workpiece with various surface properties can be optimally measured. In addition the interface for the white light sensor ZEISS DotScan sensor does already exist. Therefore an upgrade is possible at any time.

Ringlight

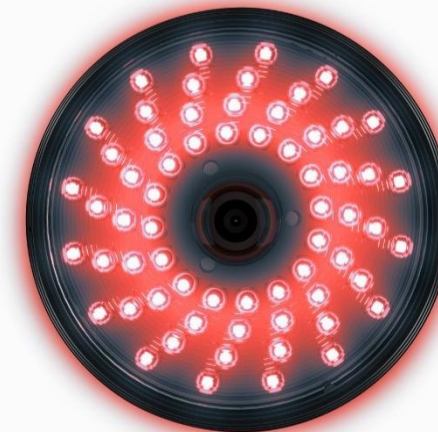
- Integrated Fresnel lens, better homogeneity, higher flexibility
- Inner and outer ring light, each with 8 segments, in red and blue
- Integrated diffuser adapter enables measurements of highly reflective surfaces

Why do we use blue and red light?

- Red surfaces reflect red light but absorb other colors.
- Example:



- Blue light gets absorbed
- Surface appears dark

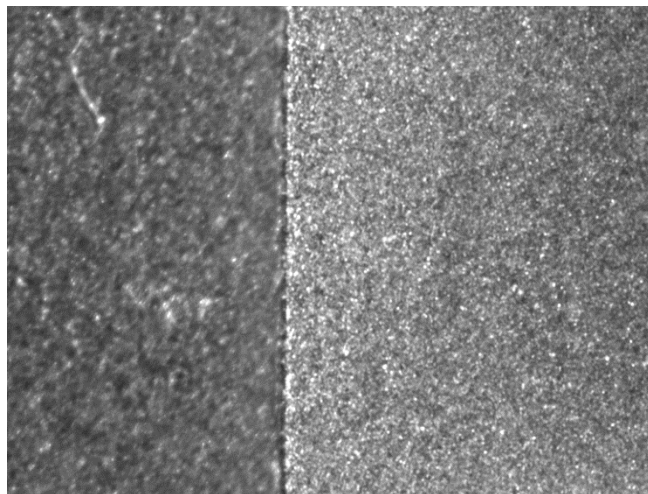


- Red light gets reflected
- Surface appears bright

Optimal optical contrast and future prepared

- Detecting difficult edges with shadowing and/or depth of sharpness

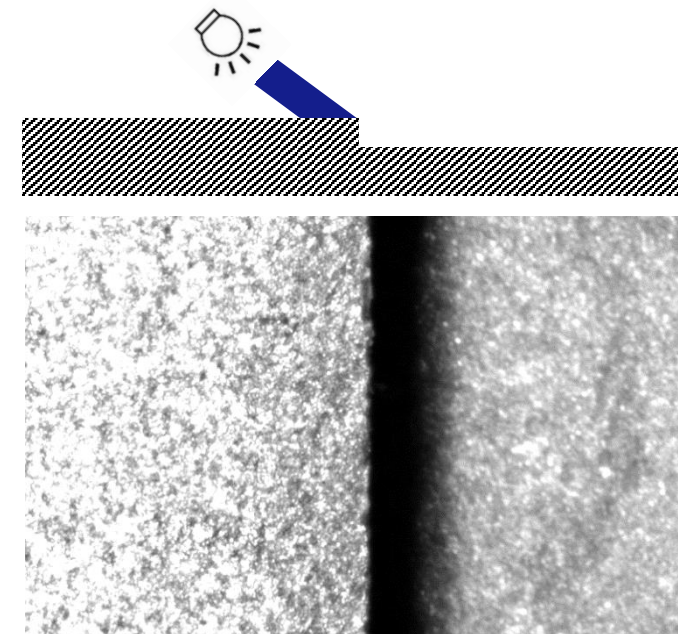
Standard lighting:



No edge detection possible

Segment lighting:

Creating shadows



Edge detection possible

#8

100 Years
of Experience

Connect to Productivity

100 Years is just the start



100 Years of Experience & Know-How in Quality Industry

Know-how, reliability and hardware stability come from the 100 years experience in tactile and optical measurement. In addition ZEISS is the technology leader and has more than 170 years experience in optics.

See more of this topic here:

[ZEISS craftsmanship since 1919](#)

[Enter a culture of quality](#)

Connect to Productivity

100 years is just the start



#9

**Global
Sales & Support**

For local support

Global sales and ZEISS Quality Excellence Center



Global availability and Know-How

ZEISS IMT Network

61 Metrology Centers
32 Sales & service organizations
10 production sites
100 business partners
3800 Employees



Benefit for customer

- ZEISS Know-How & application technician globally available.
- Service & support very close to the customer means fast reaction time.
- Less downtime and more security.

Competitive environment



We are most frequently represented worldwide.

06

Customer
success story

Customer success story

ZEISS O-INSPECT



03

ZEISS O-INSPECT – WHR Hossinger Kunststofftechnik GmbH

WHAT?

Application

- Quality control measurements of prismatic workpieces and geometric elements
- Quality control measurements of white plastic parts, as an example.

System Configuration

- ZEISS O-INSPECT
- ZEISS VAST XXT
- ZEISS Discovery.V12
- ZEISS DotScan
- ZEISS CALYPSO

WHY they chose ZEISS?

- Multisensory system for different measurements
- Optical sensor for precise measurement – high contrast due to blue and/or red light
- White light sensor for non-contact, fast and highly accurate detection of contours and contour elements, including highly reflective surfaces.

Value added to customer

- Solves current and future requirements with a flexible and choice of measuring sensor and highly precise measurements conform to ISO.



More online: https://youtu.be/ioy_iQy-3pA



Seeing beyond