

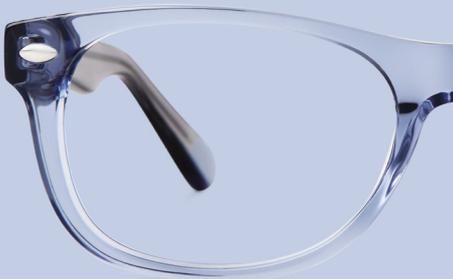
# Sensors & Solutions

## Ophthalmic lens metrology

**OPTOCRAFT**  
a MICRO-EPSILON company

**VOPTICS**  
a MICRO-EPSILON company

**μE**  
MICRO-EPSILON



More Precision

# The authority in ophthalmic lens metrology

The Micro-Epsilon Group brings together leading experts in optical measurement and inspection technology. With innovative solutions for wavefront sensing, precision measurement and automated defect inspection, the group sets new standards in quality and efficiency for the ophthalmic industry. Together, Micro-Epsilon, Optocraft, and V-OPTICS enable the development and production of optical systems with unmatched accuracy and reliability.



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## Standard products

- Customer centric measurement solutions
- Configurable to meet customer needs



## Integration into the customer's environment

- At-line, In-line automation
- Data, control and handling integration



## Training, support & consulting

- Added value for industry-leading metrology
- Competent and fast



## Customer-specific developments

- Software, hardware and more
- Special machine building

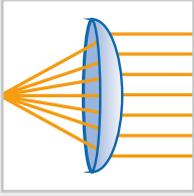
## Transform and scale your metrology!

- Leading range of metrology solutions from one source
- Game changing performance: speed, ergonomics & precision
- More Precision inspection system and sensor devices
- Broadest technology basis for ophthalmic industries
- One team of application experts, one point of contact

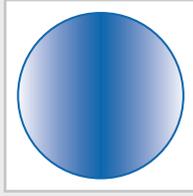
## Your first contact:

Optocraft GmbH  
sales@optocraft.de  
www.optocraft.com

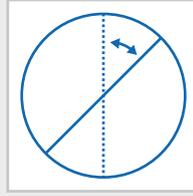
## Product Overview: Refractive data, imaging quality



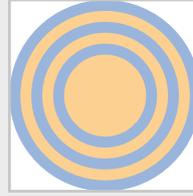
Sphere power



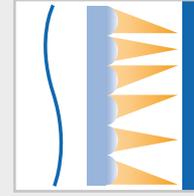
Cylinder power



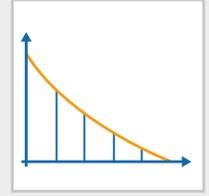
Cylinder axis



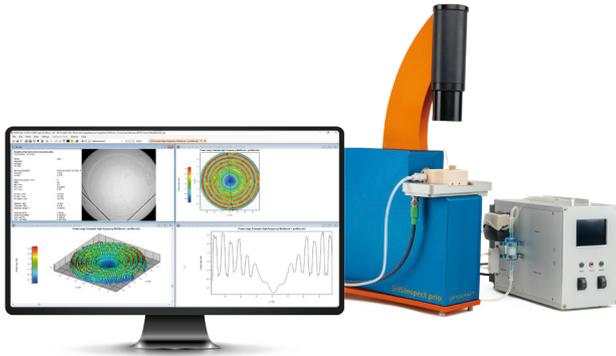
Power map



Imaging quality



MTF

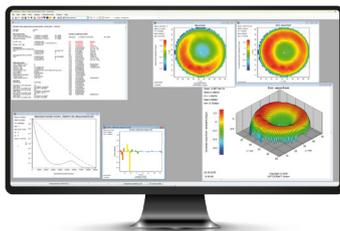
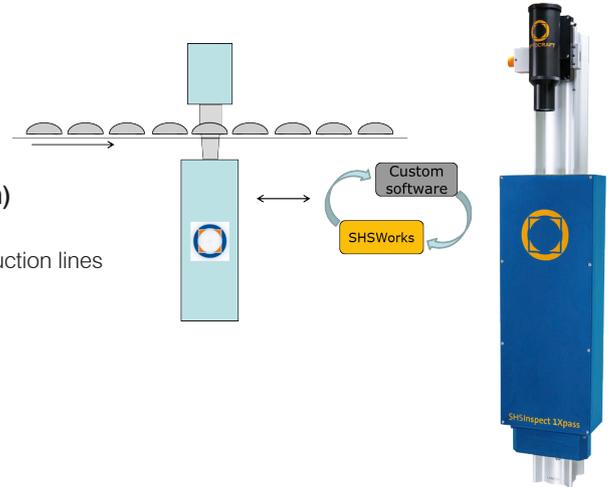


### SHSInspect prio

- Contact lenses and intra-ocular lenses
- $\pm 35$  Dpt measurement without moving parts
- Industry-leading precision and accuracy
- Unmatched ergonomics with open-top cuvette
- Temperature stabilization  $\pm 0.1^\circ\text{C}$

### SHSInspect 1Xpass (for automation)

- Contact lenses and intra-ocular lenses
- Inline-ready – integrates easily into production lines
- Measures in the blink of an eye



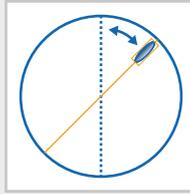
### SHSLab

- Measures wavefront of optics and lasers
- High speed, single-shot
- Excellent sensitivity of few nm RMS
- Compact, robust design – ideal for lab and inline integration

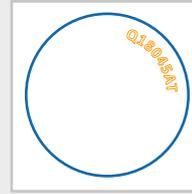
## Product Overview: Defects, marks & engravings



Defects



Axis marks



OCR

### QualiLENS 100/300

- Contact lenses, intra-ocular lenses and eyeglasses
- Objective defect detection and verdict
- Covers all defects: scratches, chips, tears, lathe marks, etc.
- Minimizes operator variability
- Samples up to  $\varnothing 90\text{mm}$

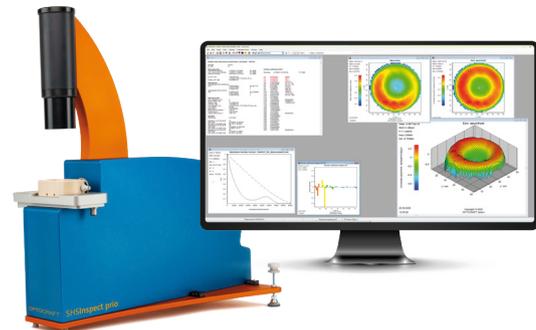


### QualiLENS 150

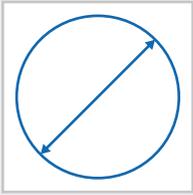
- Intra-ocular lenses and contact lenses
- Automated defect detection
- Batch measurement of lenses in trays (e.g. 91 lenses)
- Smart operation with loading/unloading stations
- Easy to use with touchscreen interface

### SHSInspect prio

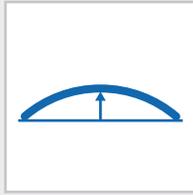
- Advanced visual inspection mode
- Finds even the most feigned marks
- Visualize geometric features and zones



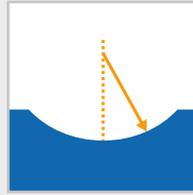
## Product Overview: Geometry



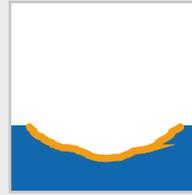
Diameter



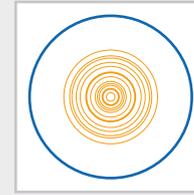
Sag



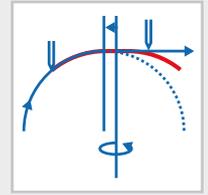
Radius of curvature



Surface shape



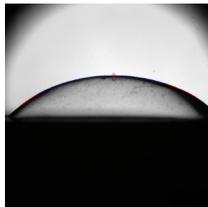
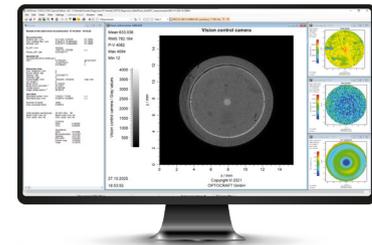
Surface defects



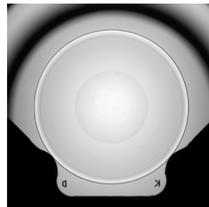
MTF

### SHSInspect autoROC

- Semifinished CL & IOL, moulds and metal tools
- Precision surface analysis: shape, apex & mean radius, conic type, etc.
- Automated measurement of tool offset for lathe calibration.
- Visualisation of defects
- Seamless integration into robot environment



SVC



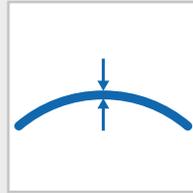
VCC



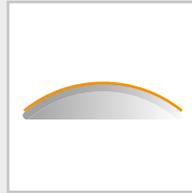
### SHSInspect prio

- High precision measurement of geometric parameters
- Vision Control Camera (VCC) for diameter
- Side View Camera (SVC) for sag and equivalent base curve (EBC) of contact lenses

## Product Overview: **Sensors for thickness & color**



Center thickness



Contour



Color



### **confocalDT**

- High precision inline and offline measurement of geometric parameters
- Non contact and fast
- Center thickness measurement of contact lenses and moulds
- Center and haptic thickness measurement of intraocular lenses



### **interferoMETER**

- Precise thickness measurements of lenses
- Measurement of air gap (e.g. lens stack)
- Resolution in the sub-micrometer range



### **colorSENSOR**

- Transmission spectrum of eye glass
- Color of packages

A photograph of two female scientists in white lab coats. They are in a laboratory setting, looking at a tablet held by the scientist on the right. The scientist on the left is smiling and looking towards the tablet. The scientist on the right is pointing at the tablet with her right hand. In the background, there is a blurred laboratory environment with a microscope visible on the right side of the frame.

## Success stories

Every breakthrough begins with a vision. Across the ophthalmic industry, Micro-Epsilon, Optocraft, and V-OPTICS turn complex challenges into success stories that redefine what's possible in the ophthalmic industry.

## Success Story

### Increased precision and ergonomics in contact lens testing

A leading manufacturer of contact lenses faced a challenge: their previous lensmeter showed high operator variability, slow measurement speed and long training times, particularly for toric and multifocal contact lenses. Thanks to the innovative inspection systems from Optocraft and V-Optics, they now achieve unmatched inspection results in a shorter amount of time.

#### Solution:

- SHSInspect prio
- QualiLENS 100

#### Customer benefits:

- Faster and more precise measurements
- 100% objective defect measurement
- Evaluation beyond refractive data: image quality analysis for improved lens performance
- Access to proven metrology expertise

#### Result:

Greater efficiency, superior lens quality, and a clear competitive edge.



#### SHSInspect prio

Refractive power, diameter, sag, imaging quality



#### QualiLENS 100

Automatic defect detection and classification

## Success Story

### Automation in IOL production

A leading intraocular lens (IOL) manufacturer relied on visual inspection for semi-finished and finished lenses. This approach caused quality risks in lathing – with costly diamond tools – and low efficiency in defect detection due to human subjectivity. An automated inspection solution enabled full defect qualification of lenses and improved the tool lifetime.

#### Solution:

- SHSInspect autoROC
- QualiLENS 150
- QualiLENS 100

#### Customer benefits:

- Extended tool lifetime and stable production quality
- Higher throughput and reproducibility in defect detection
- Reliable quality assurance through full automation

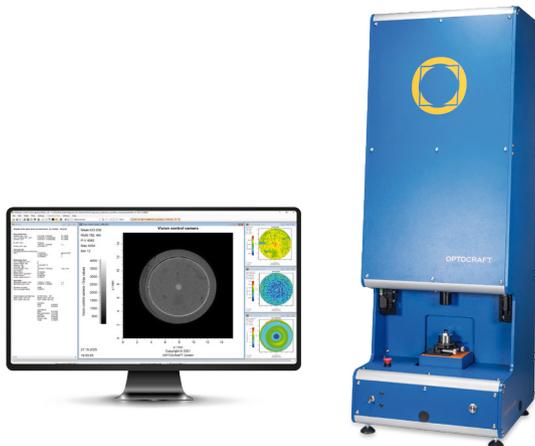
#### Result:

Maximum process efficiency, cost savings, and consistent IOL quality for improved patient outcomes.



#### QualiLENS 100

Automatically measures and inspects IOL lenses for shape, engraving, and surface defects.



#### SHSInspect autoROC

Automatic surface and radius measurement ensures consistent process control, protecting tool life and lathing quality.



#### QualiLENS 150

Automated measurement of 91 IOLs per batch delivers fast, objective defect recognition. A dedicated sorting station eliminates human error from judgment.

## Success Story

### High precision automation in eyeglass manufacturing

A leading lens manufacturer still relied on traditional lensmeters for power and centration checks. With growing demand for thinner, more precise and flawless lenses, they sought modern metrology to improve refractive accuracy, cosmetic quality and geometric control.

#### Solution:

- SHSLab
- QualiLENS 300
- confocalDT

#### Customer benefits:

- Higher precision and reproducibility
- Automation
- Full traceability of optical quality
- Direct feedback for production

#### Result:

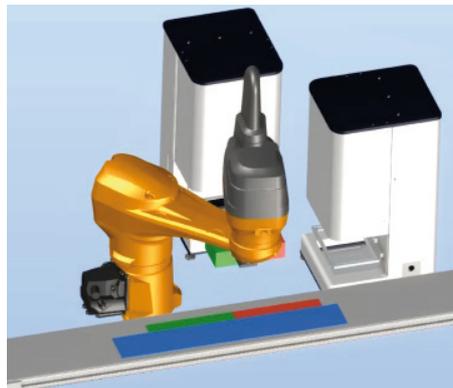
- Refractive lens finishing: centration errors reduced, power accuracy improved dramatically.
- Cosmetic & geometric inspection: inline control ensures flawless surfaces and perfect geometry



#### Application 1:

##### Refractive power & centration

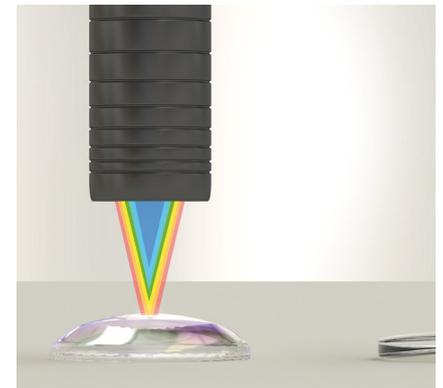
**Solution:** SHSLab – Fast wavefront evaluation in 0.1 sec per lens for sphere, cylinder, axis, and prism during edging.



#### Application 2:

##### Inline defect inspection

**Solution:** QualiLENS 300 with robotic sample feed. Its 90×90 mm<sup>2</sup> field of view at 0.023 mm resolution ensures rapid, reliable quality checks.



#### Application 3:

##### Thickness & contour measurement

**Solution:** confocalDT – Non-contact measurement of center thickness and lens position with micrometer precision.

# The authority for ophthalmic lens metrology

## Sensors and inspection systems for manual and automated operation

The Micro-Epsilon Group brings together leading companies in the field of industrial measurement and inspection technology. With Optocraft and V-OPTICS, the group includes two highly specialized companies with technological focus for the ophthalmic industry. Together, the companies of the Micro-Epsilon Group offer a uniquely broad range of precision measurement technologies for the ophthalmic industry – from development, quality inspection to serial production.

### Customer centric by passion

We create customer-centric as well as customer specific solutions in order to help you to achieve your quality targets. Our systems combine seamless integration, intelligent connectivity, and custom development to perfectly fit your workflow. With expert guidance and responsive support, we help you turn precision into performance.



For more than 55 years, Micro-Epsilon has stood for innovation, precision, and reliability in sensor technology – from distance and infrared temperature measurement to color recognition and advanced systems for dimensional measurement and defect inspection.

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Since 2001, Optocraft has been pushing the boundaries of optical metrology with innovative wavefront sensors and advanced optical test systems. Its industrial-grade measurement technology empowers customers around the world to achieve highly accurate and efficient quality control of optical systems in both development and production environments.

**Your first contact**  
OPTOCRAFT GmbH  
Phone +49 9131 691 500  
sales@optocraft.de



V-Optics is a specialist in automated optical inspection and measurement systems that characterize transmissive lenses using advanced phase-shifting deflectometry technology. Its solutions help manufacturers in ophthalmics achieve reliable, objective defect detection and traceable quality control in production environments.

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