

Perfection for mirroring components

3D surface inspection with SpecGAGE3D

ISRA
VISION

Surface inspection for mirroring components

SpecGAGE3D-3D sensors measure reflective surfaces of curved and planar objects quickly, highly accurately, and extremely cost-effectively. All **SpecGAGE3D** systems work on the measuring principle of deflectometry, in which a reflected stripe pattern from several cameras is captured and then evaluated. Errors are detected and – once known – classified straight away.

Precision down to the micrometer range and the automatic CAD comparison make **SpecGAGE3D** an ideal tool for industrial quality and process control. Development laboratories and quality assurance thus have an instrument for improving production processes – helping to avoid production errors, save resources, and reduce production costs



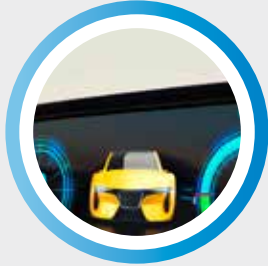
	SpecGAGE3D-planar	SpecGAGE3D-XL	SpecGAGE3D-robot
Measuring principle	Phase-measuring deflectometry	Phase-measuring deflectometry	Phase-measuring deflectometry
Measuring field (standard)	300 × 200 mm ² (flat object)	600 × 400 mm ² (flat object)	200 × 300 mm ²
Lateral resolution	approx. 240 µm	approx. 240 µm	> 50 µm
Measurement time	typ. 3-15 sec	typ. 3-15 sec	> 1 sec
Evaluation speed	typ. 3-10 sec	typ. 3-10 sec	
Standard cycle time	typ. 6-25 sec	typ. 6-25 sec	
Accuracy of elevation map	+/- 10 µm on 10 × 10 cm ²	+/- 10 µm on 10 × 10 cm ²	
Cameras	2 (4) × 1,3 MP CCD		4 × 5 MP CMOS
Outer dimensions W × H × D mm ³	860 × 834 × 600 mm ³	1696 × 1819 × 1210 mm ³	520 × 480 × 100 mm ³

All SpecGAGE3D units provide

- Camera configuration adaptable to the measuring task
- Fast integration into production lines with standard software interfaces
- Ready to measure in challenging production environments – No moving components, robust against vibrations
- 100 % in-line measurement
- Manual or automatic loading
- Semi-automatic or fully automated measuring process
- Clear OK/NG decisions

Applications

SpecGAGE3D is applicable for all glossy surfaces such as:



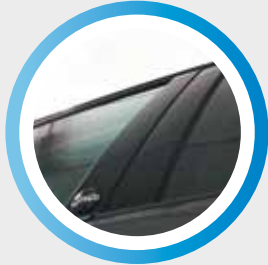
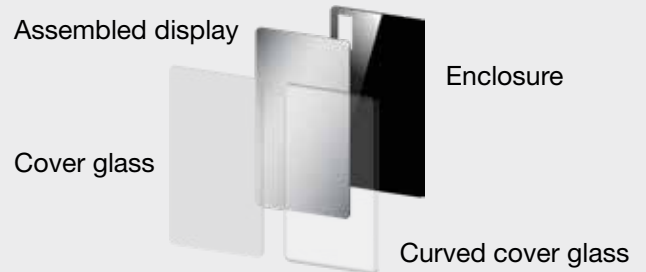
Automotive display

SpecGAGE3D inspects the **light guide**, the **display**, and the **cover glass** of automotive displays.



3C

Cosmetic inspection for glossy **backs**; form control and defect detection for **displays** and flat or curved **cover glasses**.



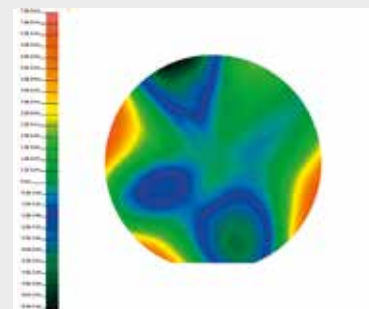
Car Exterior/Interior

Cosmetic inspection of add-on parts, such as **B-pillars**, **trims**; inspection & form control of **headlights**, **mirrors**, **bumpers**, **sunroofs**.



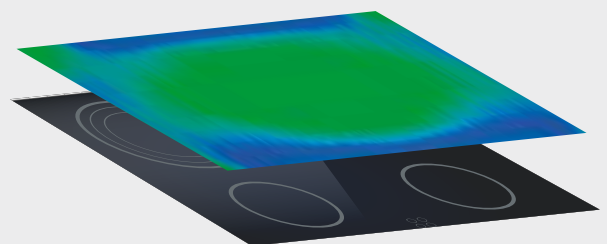
Semiconductor

Topographic measurement of **bare** or **sapphire wafers**: Precise height measurement for wafer shape inspection.



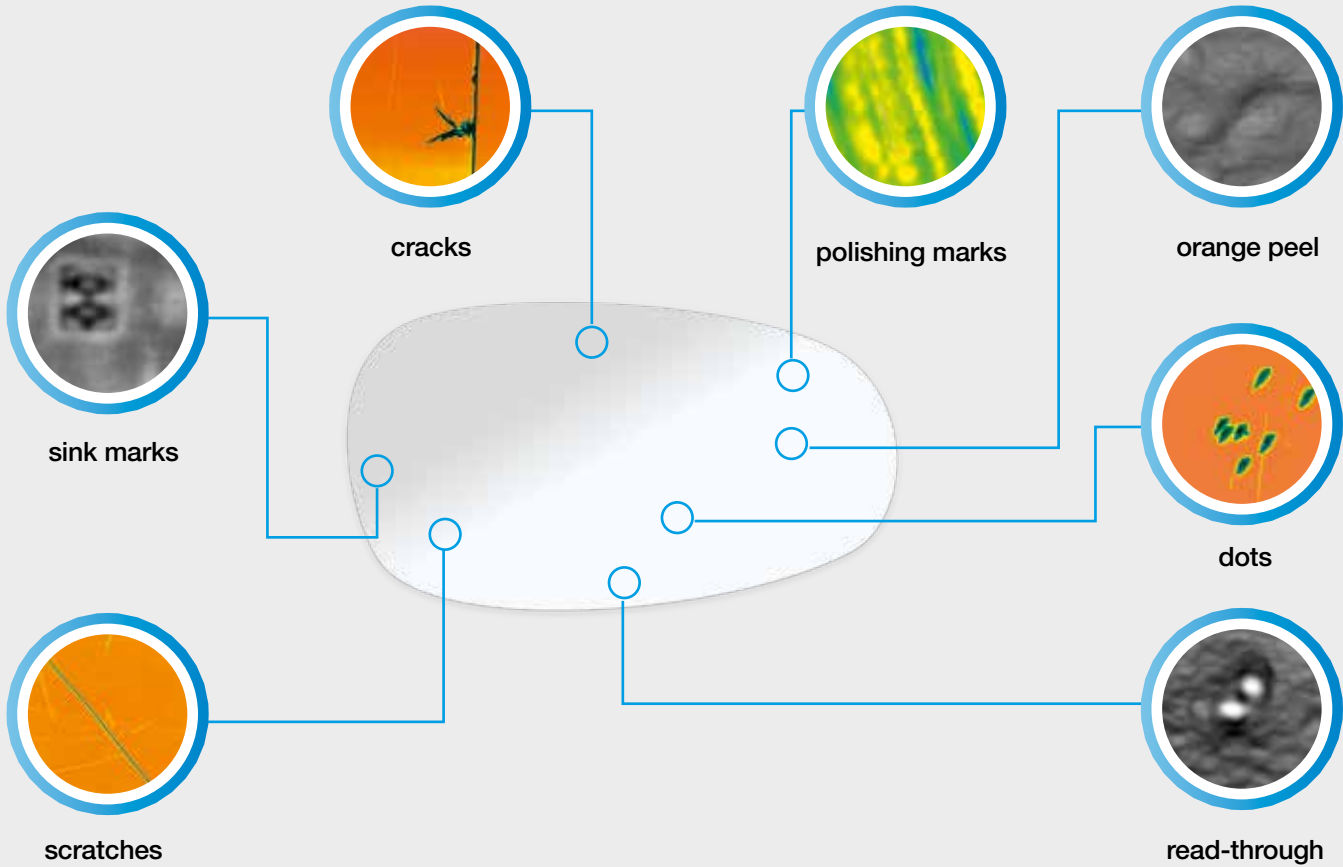
White goods

Defect detection and cosmetic inspection of **coated or painted high gloss fronts**, **cooktops**, **glass ceramics**.



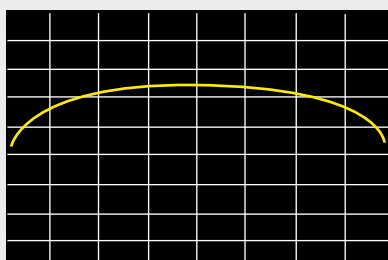
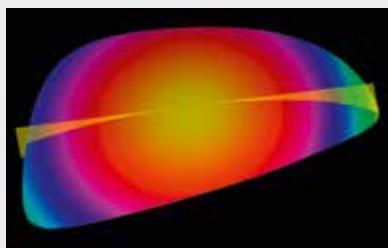
Form control & defect detection in one measurement

Typical cosmetic defects



Form control / CAD comparison

Geometrical information regarding shape / flatness / radius / CAD comparison



The screenshot shows the SpecGAGE3D software interface. The top bar displays the product name "Rear view mirror" and the part type "OD". The main area is divided into two sections: "Defect detection" and "CAD comparison". The "Defect detection" section shows a grayscale image of the mirror with a red box highlighting a defect. The "CAD comparison" section shows a 3D surface plot of the mirror. On the right side, there are buttons for "OK", "NG", "Remeasure", and "History". At the bottom, there is a table of deviation data and a status bar with various indicators.

Deviation	Value in µm	R	Slope Error	Value in mm	R	Dimension	Value in mm	CAD
Circle	141.45	Red	Circle	0.17	Green	Length	274.50	282.10
Flat	185.53	Red	Flat	4.88	Green	Width	131.00	135.00
Radius	74.70	Green	Radius	0.17	Green			
Roundness	2	Green	Roundness	0	Green			

Operator: QA
Part Type: OD
Product: Rear view mirror
Part: LMS2.5497162-11.9705061
Machine: 20000730
Customer: N/A

Features

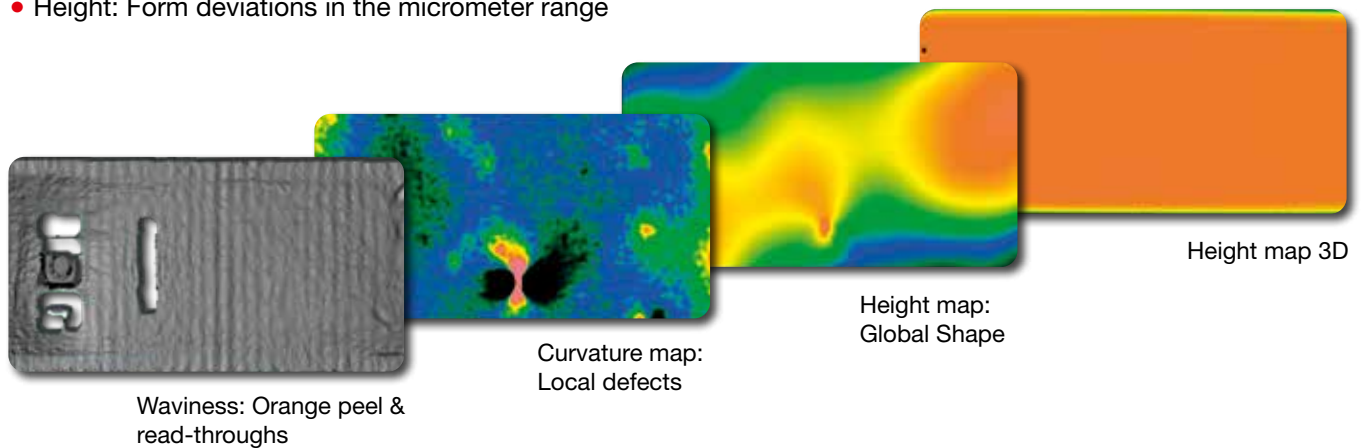
Evaluation channels

Based on the measurement principle of deflectometry, **SpecGAGE3D** evaluates multiple channels in only one measurement run:

- Curvature: Local defect detection, e.g. inclusions, scratches
- Waviness: Local distortions, e.g. orange peel, readthroughs
- Height: Form deviations in the micrometer range

Channels

- Height map
- Curvature
- Slope
- Contrast



Measurement approach



Multi part-inspection

- Simultaneous inspection of several slightly curved components
- Series measurement of components in trays
- No individual withdrawal and positioning of volume products



Large part-inspection

- Automated inspection of complex parts
- Multi-camera system for best coverage of all surface areas
- Optimization for complex geometries possible

Benefits

- Fast capturing of form and defects: Only one measuring tool for two measuring tasks
- 24/7 objective & constant control besides manual evaluation
- Traceability: Detect production deficiencies over time
- Fast and precise CAD comparison
- Flexibility in part sizes, shape, and variety

Innovations for Automated Optical 3D-Quality Control

Automation at its best

ISRA VISION has been a leading supplier of high-performance quality inspection, robot guidance and production logistics systems for more than 30 years.

Our systems are used around the world in many different industries and applications. Our mission is to offer a comprehensive portfolio of standard solutions, covering all requirements along the process chain.

ISRA's experience and technological competence in the field of industrial image processing has been proven by thousands of successfully installed systems worldwide.

Benefits at a glance

Customers opt for ISRA's solutions for the following reasons:

- Our development activities are consistently aligned with our customers' requirements.
- We are continuously expanding our knowledge and expertise in all core areas of industrial image processing.
- Our customer relationships do not end with the delivery of new products. The Customer Support Center provides comprehensive support for the use of your systems and helps you to increase your productivity – be it via our telephone hotline, remote service, on-site service, or our maintenance services.
- More than 900 employees at our sites in Europe, North and South America, and Asia are committed to your success.



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