

Connected microscopy. Accelerate decision making.



ZEISS Industrial Microscopy Series



zeiss.com/industrial-microscopy

Seeing beyond

From image analysis to productivity

Data processing across dimensions

With ZEISS Industrial Microscopy Series, ZEISS supports its customers in obtaining, managing and utilizing their microscopy data consistently in multiuser environments, across multiple departments (R&D, quality control and production) and across different microscopy types (light, confocal, electron, X-Ray microscopes).

The ZEN core software suite provides a workflow-oriented way to operate ZEISS microscopes, machine learning and AI-based image analysis for a broad range of applications, and seamless connectivity across the whole microscopy portfolio.

This enables user-independent operation, the analysis of trends and deeper insight through the combination of results across dimensions (from centimeters to nanometers) or modalities (images, roughness data, elemental composition data) and the sharing of data. The result: more productivity and higher certainty in industrial microscopy applications.



Intelligent data handling for connected microscopy

ZEN core's intuitive user interface allows users to operate different microscopes in the same way. From stereo microscopes, to fully automated high-end systems, ZEN core enables the correlation of light and electron microscopy in multi-modal workflows, and provides connectivity between systems, departments, and locations.

ZEN core handles more than just microscopy imaging. It is the most comprehensive suite of imaging, documentation, measurement, analysis, and data connectivity tools for multi-modal microscopy, connecting shop floor inspection, analysis stations, and laboratories.

Workflow-oriented ✓

ZEN core enables an easy to use, workflow-oriented user experience for the most comprehensive range of microscopy applications, and challenges.

Correlation and Connectivity ✓

Through its correlative data workflow, ZEN core allows quick and easy relocation of regions of interests, across different imaging methods and microscope technologies.

Mobile Access ✓

ZEN Data Explorer allows access to all data on the central ZEN Data Storage from any place via mobile device or browser.

Reliable Data Storage ✓

The central database for secure data handling and documentation offers a scalable central storage solution for results, methods, and templates.

Third-Party Import ✓

Users can import and process third-party images, from instruments outside of the ZEISS portfolio.



Workflow-oriented solutions for efficient quality analysis

With the ability to generate fast, reproducible and user-independent results and application-oriented, ready-to-go solutions, ZEISS Industrial Microscopy Solutions helps customers boost their productivity.

The integrated hardware and software solutions enable users to arrange their microscopy tasks as workflows and automate them by using motorized systems. ZEN core's ability to connect and correlate data across all microscope types thus helps deliver more meaningful information in the form of correlated multi-scale and multi-modal characterization data.

Additionally, customers can access, process and manage their data and workflows across labs and locations thanks to ZEN core's database connectivity features.

01 Fields of Applications

Image, analyze, connect.

ZEISS microscopes are the ideal solution for:

- metallurgy & failure analysis
- visual inspection and documentation
- optical metrology
- particle analysis and technical cleanliness
- surface characterization

Further information
on page 8



02 Product Range

ZEISS offers a uniquely comprehensive portfolio of microscopy solutions:

- stereo, zoom, & compound microscopes
- digital microscopes
- confocal microscopes
- electron microscopes
- X-Ray microscopes

In addition, the intuitive ZEN core software allows users to make full use of their microscopes, boasting powerful features such as automated workflows and hardware-independent analysis.

Further information
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03 Solutions tailored to your manufacturing process

ZEISS offers dedicated industrial microscopy solutions for users in different departments:

- research and development
- materials and quality labs
- incoming goods inspection
- metrology labs
- at line inspection

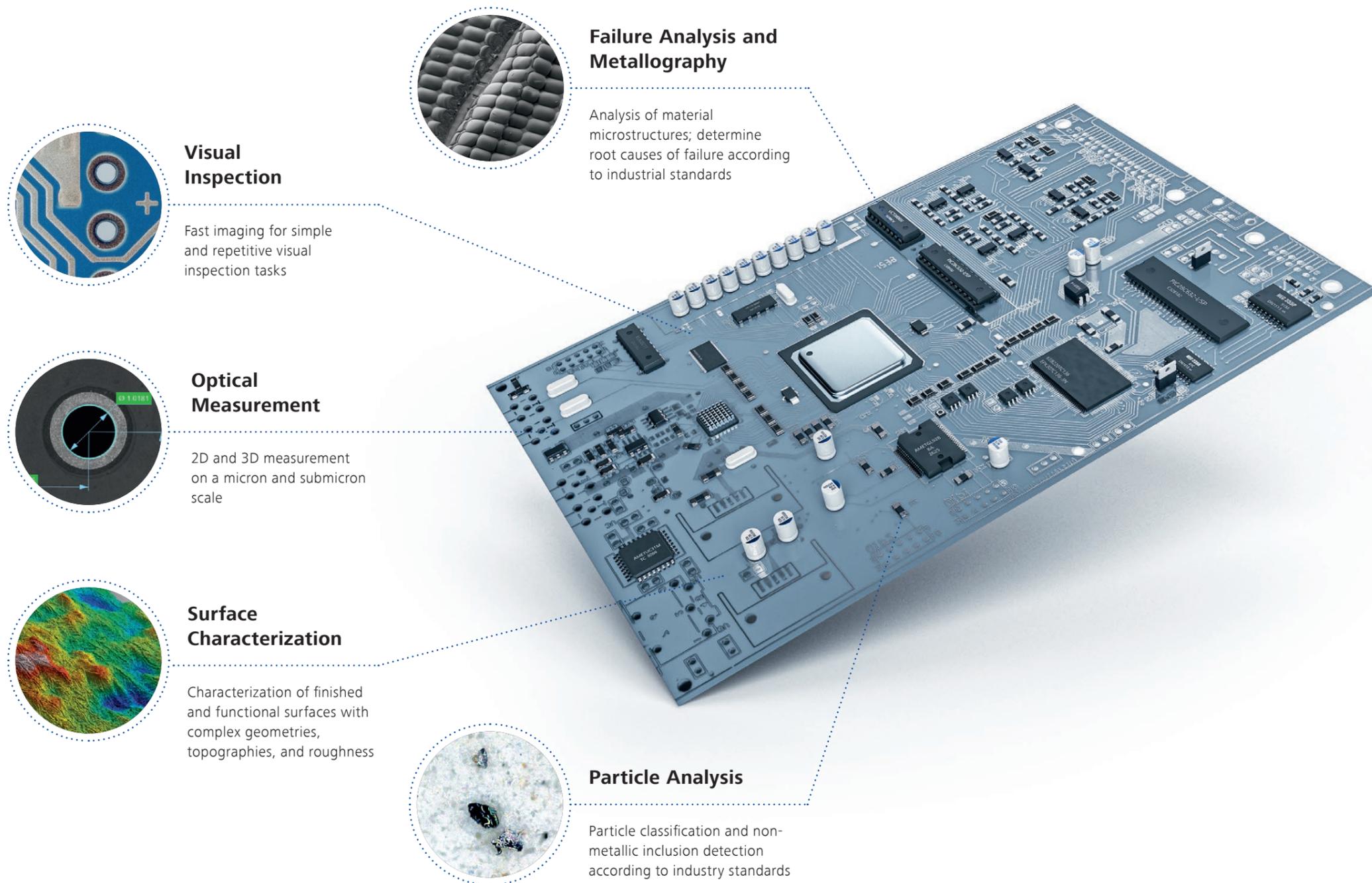
ZEISS Industrial Microscopy Series offers unrivalled connectivity across departments.

Further information
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One customer, one part – different microscopy applications

ZEISS delivers the broadest range of solutions for industrial applications in various industrial segments: electronics, automotive, aerospace, medical equipment and additive manufacturing. Partner with us to solve your specific technological problems, advance your processes and minimize your time-to-result, increasing productivity using our comprehensive microscopy portfolio and targeted software solutions. Achieve high quality imaging with our unique microscopy solutions in light, digital, X-Ray and electron imaging modalities.



A comprehensive solution portfolio for various industries

Development, production and quality assurance all need powerful imaging and analysis tools to gather valuable data about products and processes. With over 170 years of experience in microscopy and longstanding collaborations with industry customers, ZEISS delivers innovative, market-leading solutions for:



Automotive



**Manufacturing
and Machining**



Electronics



Aerospace



Medical



Failure Analysis and Metallography

Determining the root cause of failure

Challenge

Metallography and failure analysis investigation are essential tasks for ensuring the performance and safety of manufactured parts.

Metallography reveals the internal structure of materials and enables the analysis of critical material properties and helps control them during the production process.

On the rare occasion a component fails, investigation is needed to inspect, analyze, and document the failure to reveal the underlying root cause. A broad range of microscopy solutions may be required to gain a comprehensive insight about the failure, from low-magnification stereo, to light, electron or X-Ray microscopes.

Your benefit with ZEISS

Faster time-to-result through workflow-oriented software and correlation of results:

- Benefit from workflow automation and correlative microscopy with a user friendly interface
- Designed for industry use and for the fastest, most accurate, best quality image and data

Solutions

Light microscopes:

ZEISS SteREO Discovery
ZEISS Axio Imager
ZEISS Axio Observer
Digital microscopes:
ZEISS Smartzoom

Electron microscopes:

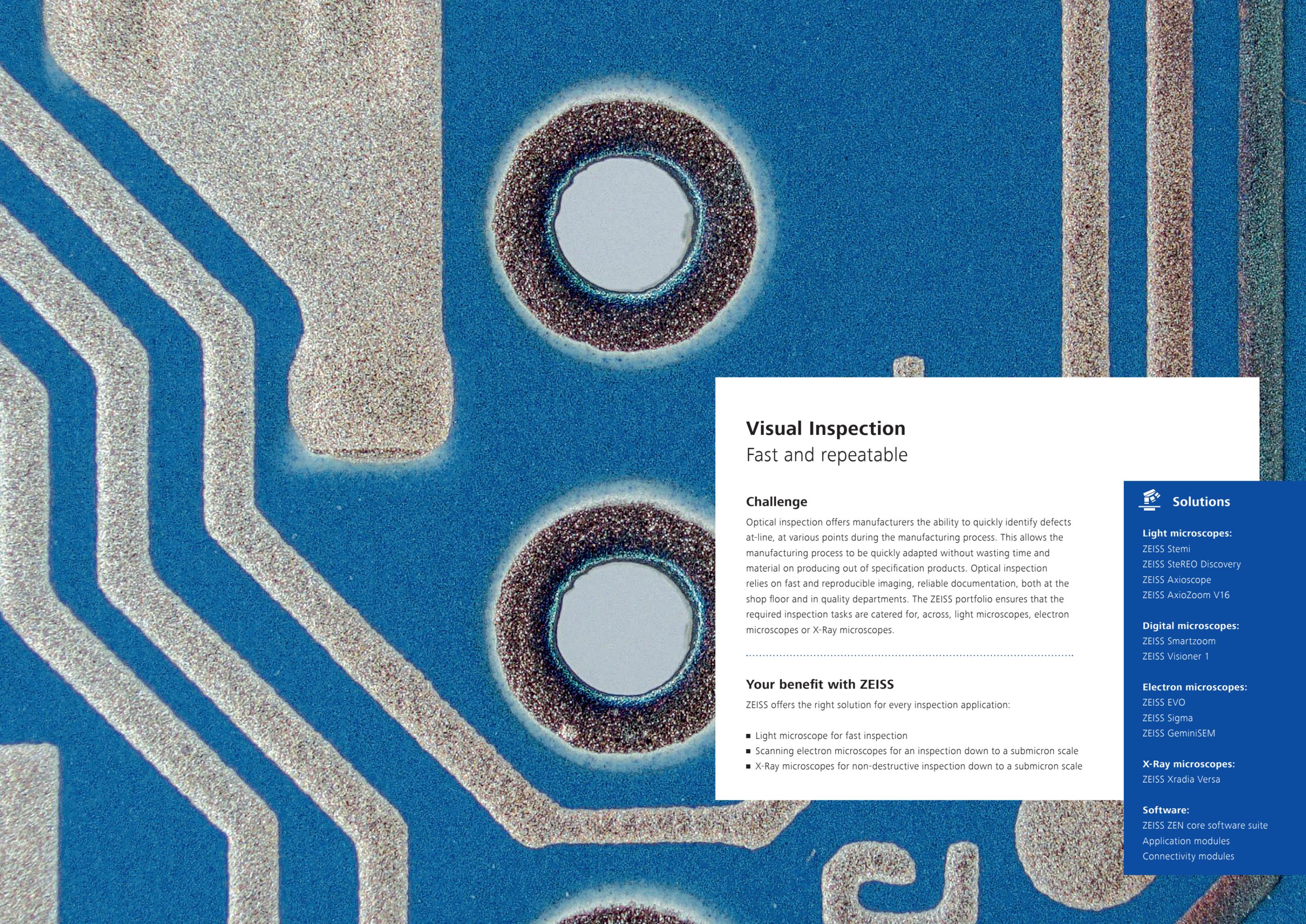
ZEISS EVO
ZEISS SIGMA
ZEISS Crossbeam

X-Ray microscopes:

ZEISS Xradia Versa

Software:

ZEISS ZEN core software suite
Application modules
Connectivity modules



Visual Inspection

Fast and repeatable

Challenge

Optical inspection offers manufacturers the ability to quickly identify defects at-line, at various points during the manufacturing process. This allows the manufacturing process to be quickly adapted without wasting time and material on producing out of specification products. Optical inspection relies on fast and reproducible imaging, reliable documentation, both at the shop floor and in quality departments. The ZEISS portfolio ensures that the required inspection tasks are catered for, across, light microscopes, electron microscopes or X-Ray microscopes.

Your benefit with ZEISS

ZEISS offers the right solution for every inspection application:

- Light microscope for fast inspection
- Scanning electron microscopes for an inspection down to a submicron scale
- X-Ray microscopes for non-destructive inspection down to a submicron scale

Solutions

Light microscopes:

ZEISS Stemi
ZEISS SteREO Discovery
ZEISS AxioScope
ZEISS AxioZoom V16

Digital microscopes:

ZEISS Smartzoom
ZEISS Visioner 1

Electron microscopes:

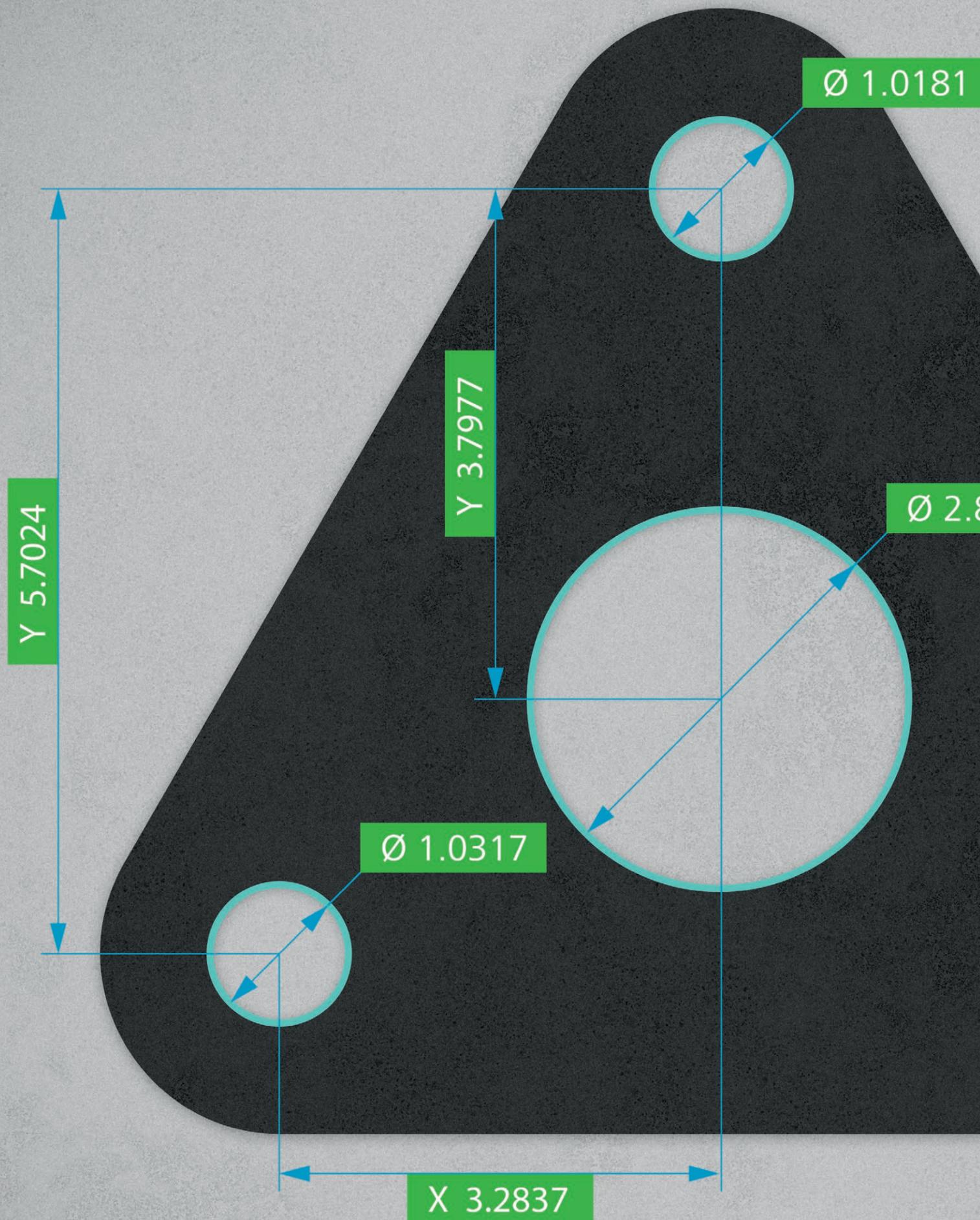
ZEISS EVO
ZEISS Sigma
ZEISS GeminiSEM

X-Ray microscopes:

ZEISS Xradia Versa

Software:

ZEISS ZEN core software suite
Application modules
Connectivity modules



Optical Measurement

Precise metrology at a microscopic scale

Challenge

As production technology progresses, manufacturing tools are able to produce features with ambitious tolerances on work pieces. To assure the quality of these products and components, manufacturers need to measure in dimensions smaller than a human eye can see. Solutions that combine the magnification ability of microscopes with metrology are required to make well-informed decisions on the smallest scales.

Your benefit with ZEISS

ZEISS's unmatched experience in microscopy coupled with its extensive know-how in metrology delivers accurate results with a broad range of microscope types:

- Light microscopes for automated routine tasks
- Scanning electron microscopes for submicron metrology
- X-Ray microscopes to measure small features non-destructively with highest accuracy (1,9 µm+ L/100)

Solutions

Light microscopes:

ZEISS Stemi
ZEISS SteREO Discovery
ZEISS AxioScope
ZEISS AxioZoom V16

Digital microscopes:

ZEISS Smartzoom
ZEISS Visioner 1

Electron microscopes:

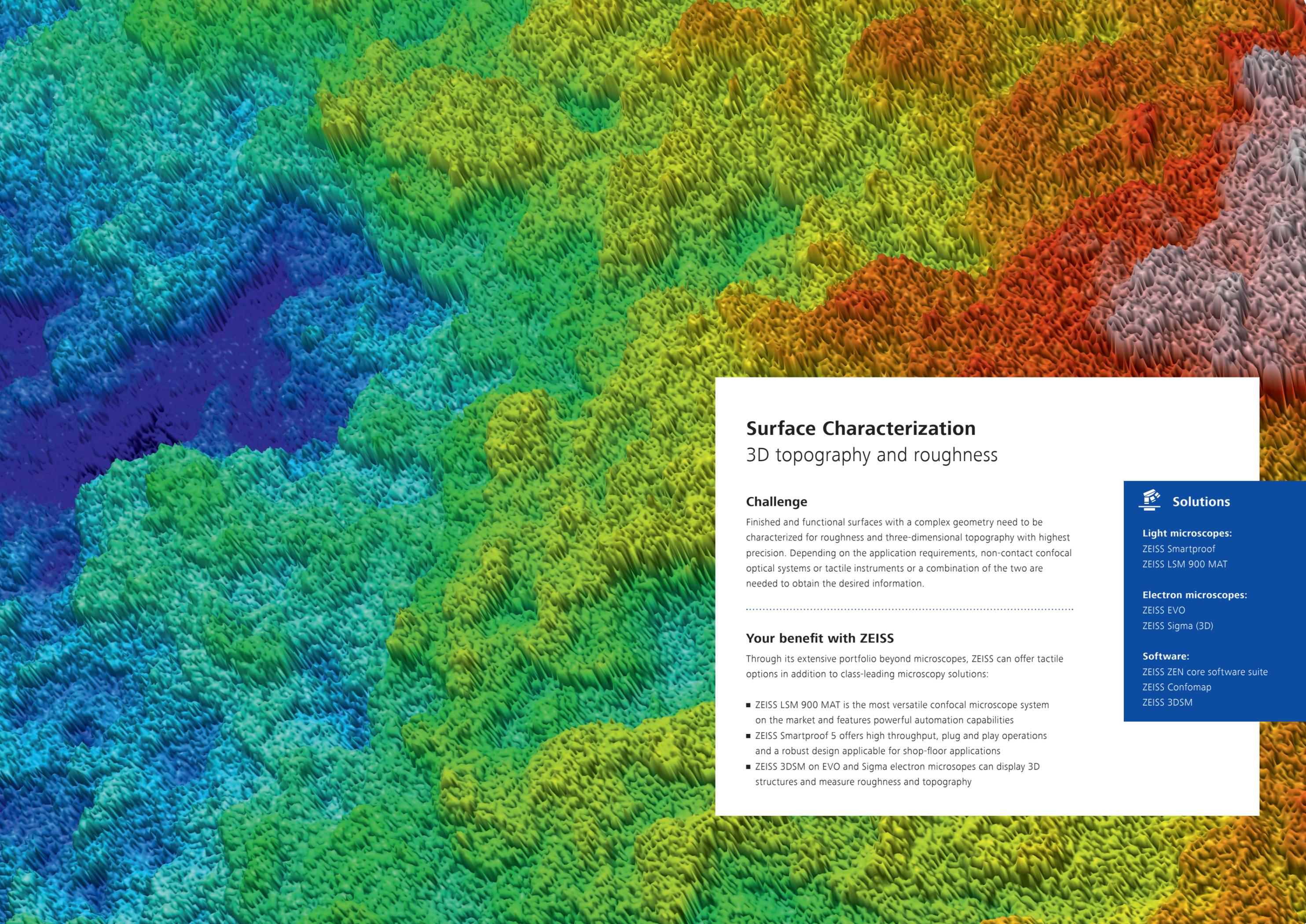
ZEISS EVO

X-Ray microscopes:

ZEISS Xradia Versa series
ZEISS Xradia Context

Software:

ZEN core software suite
ZEISS NEO pixel



Surface Characterization

3D topography and roughness

Challenge

Finished and functional surfaces with a complex geometry need to be characterized for roughness and three-dimensional topography with highest precision. Depending on the application requirements, non-contact confocal optical systems or tactile instruments or a combination of the two are needed to obtain the desired information.

Your benefit with ZEISS

Through its extensive portfolio beyond microscopes, ZEISS can offer tactile options in addition to class-leading microscopy solutions:

- ZEISS LSM 900 MAT is the most versatile confocal microscope system on the market and features powerful automation capabilities
- ZEISS Smartproof 5 offers high throughput, plug and play operations and a robust design applicable for shop-floor applications
- ZEISS 3DSM on EVO and Sigma electron microscopes can display 3D structures and measure roughness and topography



Solutions

Light microscopes:

ZEISS Smartproof
ZEISS LSM 900 MAT

Electron microscopes:

ZEISS EVO
ZEISS Sigma (3D)

Software:

ZEISS ZEN core software suite
ZEISS Confomap
ZEISS 3DSM



Particle Analysis

Reliable quality assurance for technical cleanliness

Challenge

The cleanliness of components and parts is at the center of most industrial manufacturing processes, as these components must be free of contaminants to ensure high-quality finished products.

Undiscovered particulate contamination may affect the performance, lifetime, and reliability of final products. Therefore more and more components must be manufactured according to stringent cleanliness regulations (ISO 16232, VDA 19, and others), which requires microscopic particle analysis.

Your benefit with ZEISS

ZEISS enables you to make informed decisions about the root cause of contamination.

Depending on the particle analysis requirement, light, electron or even correlative solutions can be used for the best possible solution.

Solutions

Light microscopes:

ZEISS SteREO Discovery.V8
ZEISS Axio Zoom.V16,
ZEISS Axio Imager 2

Electron microscopes:

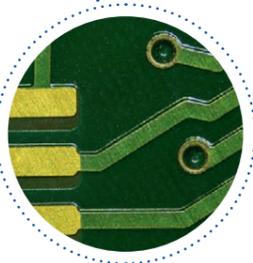
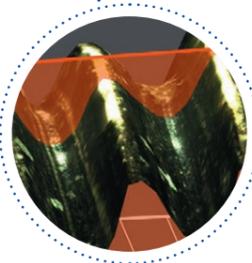
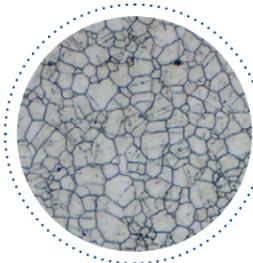
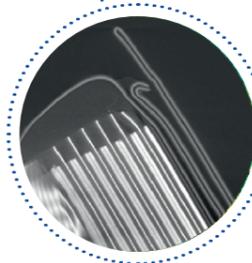
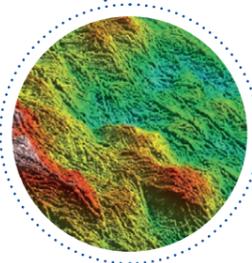
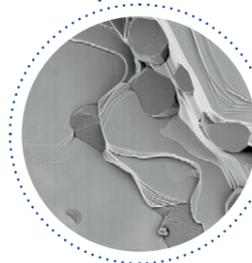
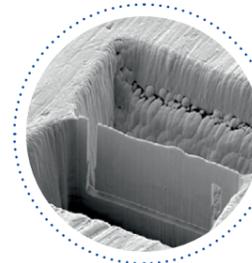
ZEISS Evo
ZEISS Sigma 300

Software:

ZEISS ZEN core software suite
ZEISS SmartPI
ZEISS Technical Cleanliness Analyzer

From micrometer to nanometer

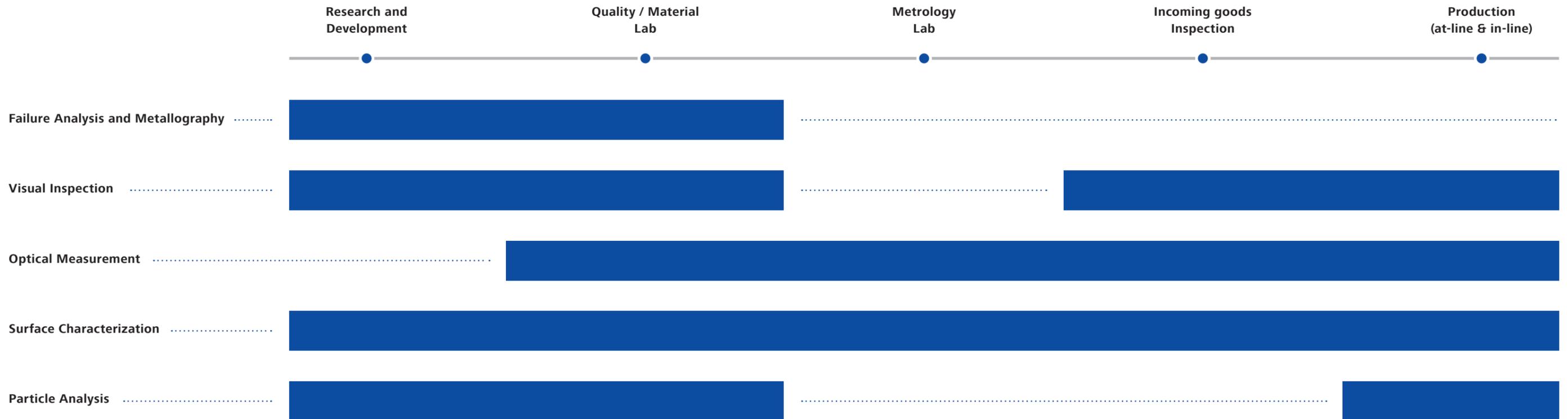
ZEISS delivers a uniquely comprehensive portfolio of all microscope types relevant for industrial applications. This, combined with the correlatable data across the various microscope technologies and the workflow-oriented ZEN core software, provides customers with a complete and coherent solution system that only ZEISS can offer.

Light/Confocal		X-Ray Tomography		Light/Confocal		Scanning Electron	
1 μm	0.7 μm	0.5 μm	200 nm	< 2 nm	< 1 nm		
							
Stereo	Digital	Widefield	X-Ray	Confocal	Conventional	Field Emission	Focused Ion Beam
							
ZEISS Stemi 305 / 508 ZEISS SteREO Discovery Go from largest overview into the smallest details	ZEISS Axio Zoom.V16 ZEISS Smartzoom ZEISS Visioner 1 Reduce image acquisition times to speed up analysis	ZEISS Axio Imager 2 ZEISS Axioscope Family & ZEISS Axiolab 5 Be open for advanced materials research	ZEISS Xradia Versa Series Industrial X-Ray microscopy: Extreme resolution & contrast	ZEISS Smartproof 5 ZEISS LSM 900 Fast and robust confocal technology for trusted results	ZEISS EVO Best qualified SEM to support industrial quality and failure analysis	ZEISS GeminiSEM ZEISS Sigma Field emission SEM for the highest demands in imaging and analytics	ZEISS Crossbeam FIB-SEM for high throughput 3D analysis and sample preparation

Solutions tailored to your manufacturing process

Interest in knowledge knows no departmental boundaries

Imagine a defect is detected in a routine optical inspection workflow during production. Why not send the results to the quality lab for further analysis? If it's determined that further investigation is required, the part and its existing data can provide the context for subsequent investigations to pinpoint the root cause. By documenting and sharing the data, the results can be used in the production to improve the process to prevent defects or in R&D to guide future developments. Or go even further than that: Share the analysis and imaging workflows across your manufacturing locations and establish a truly uniform global quality standard.



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