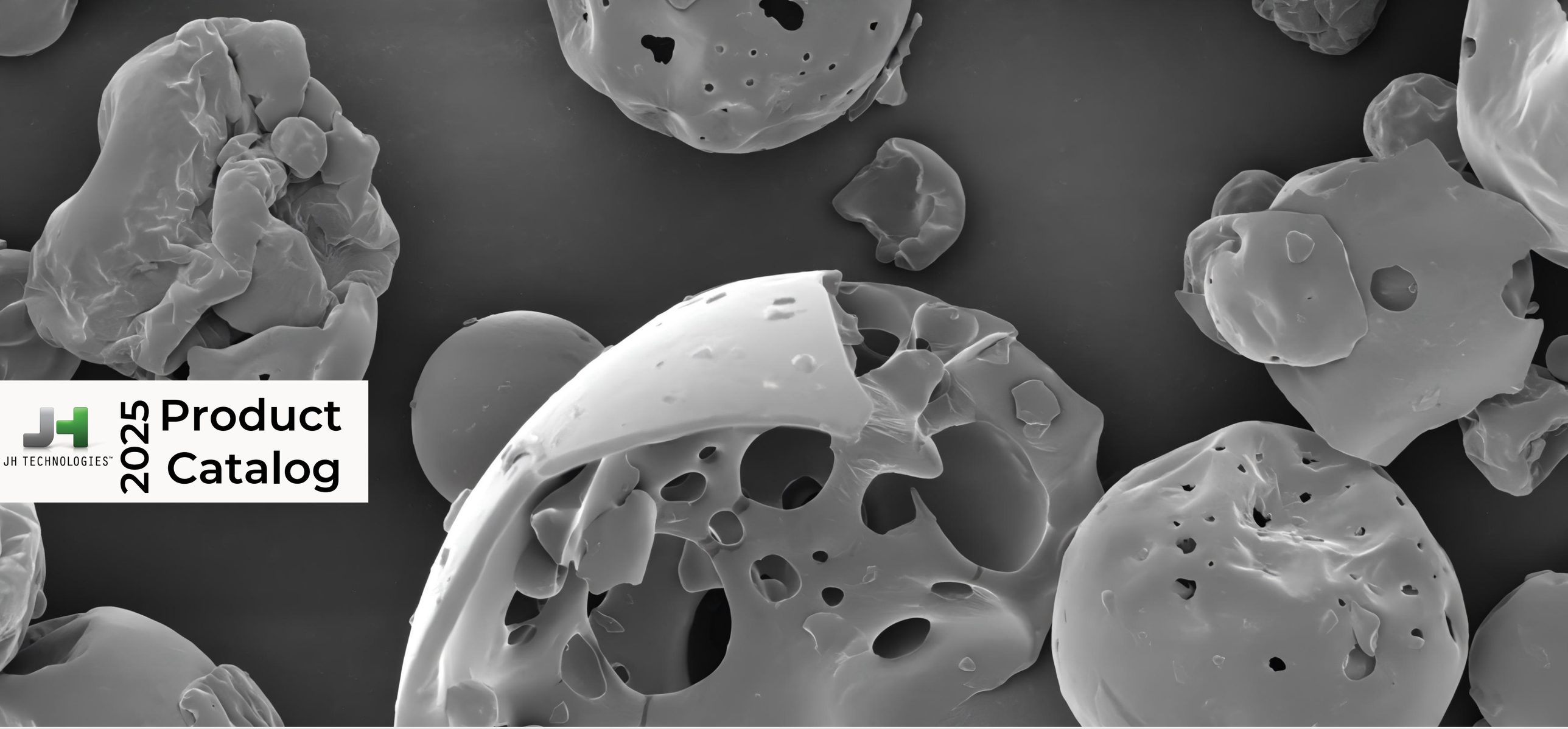


JH TECHNOLOGIES™

2025 Product Catalog

We make the invisible visible helping manufacturers, researchers, and educators get the most out of their materials

Our Trusted Partners

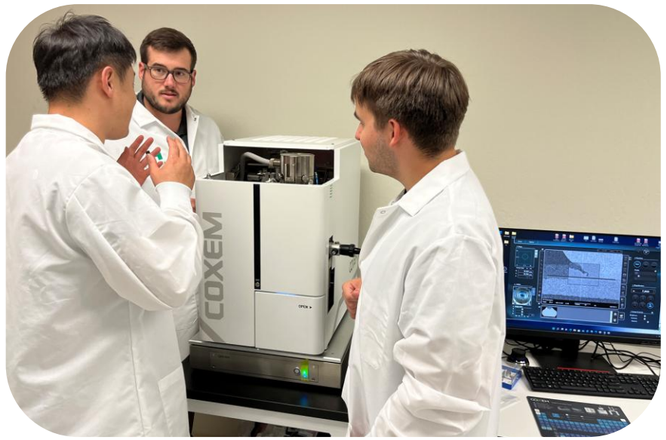
Office (408) 436-6336
Fax (408) 436-6343

orders@jhtechnologies.com

- 38 years of expertise in materials science, failure analysis, quality control, and manufacturing.
- Advanced equipment and analytical services to uncover insights beyond the visible range.
- Hands-on expertise—we actively use the tools we sell for precise guidance and optimal outcomes.

JH TECHNOLOGIES™
Making the Invisible Visible

Lab Services

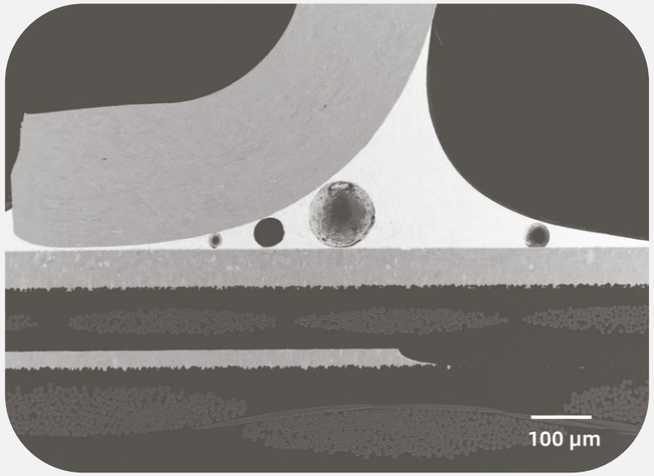


Services Offered:

- Failure Analysis
- Materials Characterization
- Sample Preparation
- Quality Validation

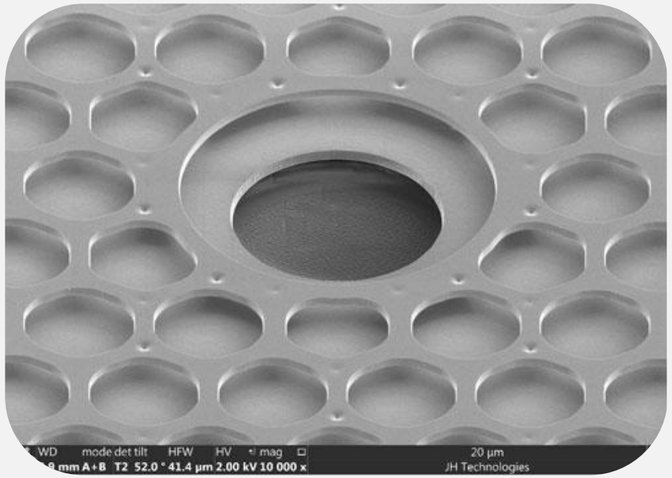
Applications

- Microtechnology
- Education
- Medical Devices
- Forensics
- Semiconductor
- Material Science
- Metallography
- Sample Preparation for Electron Microscopy



Complete Workflow Solutions

- Sectioning & Polishing
- Sample Prep for Electron Microscopy
- Electron, Optical, & X-Ray Imaging /Analysis
- Metrology/Surface Profiling
- Hardness testing
- Data Output



Featured Equipment:

- Metrology
- Metallography Sample Prep
- EM Sample Prep
- SEM ‘s
- Hardness Tester’s
- Imaging /Analysis

Company Headquarters

Four Demonstration Centers and Our Analytical Lab

Fremont, CA Showroom & Analytical Lab

- Applications engineers
- Imaging support
- Analytical services
- Over 100 years of combined experience
- $2 million of demo inventory
- Stocking warehouse

Southern California Showroom

18025 Sky Park Circle, Suite M
Irvine, CA 92614

Pacific Northwest Showroom

7969 SW Cirrus Dr. Bldg 22
Beaverton, OR 97007

New England Showroom

11 Trafalgar Sq. Ste 103
Nashua, NH 03063

iFuSE – Inspiring Future Scientific Exploration

Donating To K-12 Schools

Help educate our future generation.

Donate or trade-in your old microscopes to us and we will refurbish and donate them to K-12 schools with active STEM programs

Giving Teachers The Tools To Illuminate Young Minds

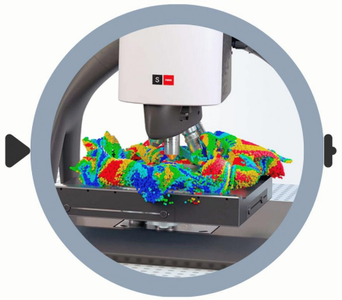
Some of the schools we have donated to:

- Blair School, Kenya
- Synapse School, CA
- Liberty High School, CA
- And many more...www.iFuSE.us

Optical Inspection

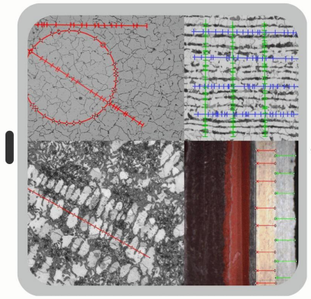
X-Ray/CT Inspection

Surface Metrology

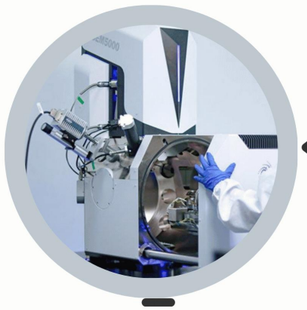


Sample Preparation

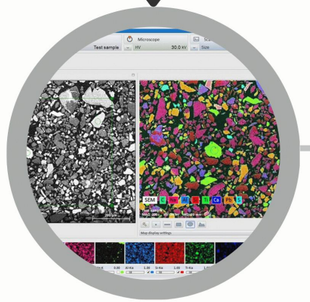
Hardness Testing



Imaging & Analysis

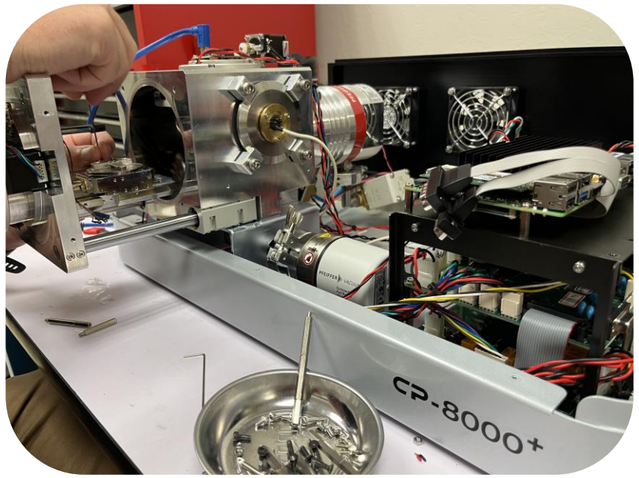


SEM



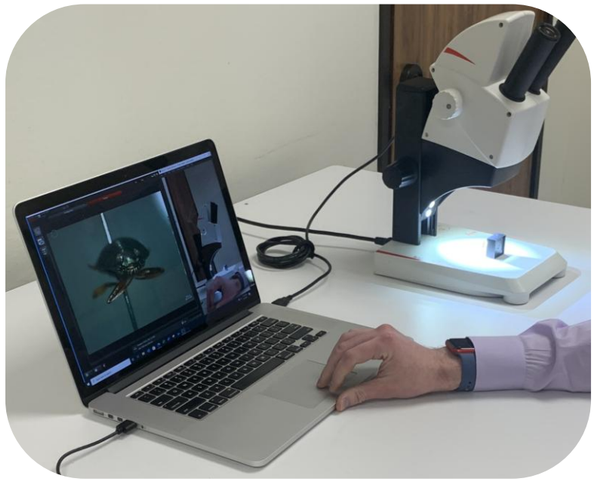
Data Output

Warranty and Maintenance Services



Preventative Maintenance

Regular inspections, calibrations, and tune-ups help extend the lifespan of your instruments, minimize downtime, and ensure optimal imaging quality.



Products We Service & Repair

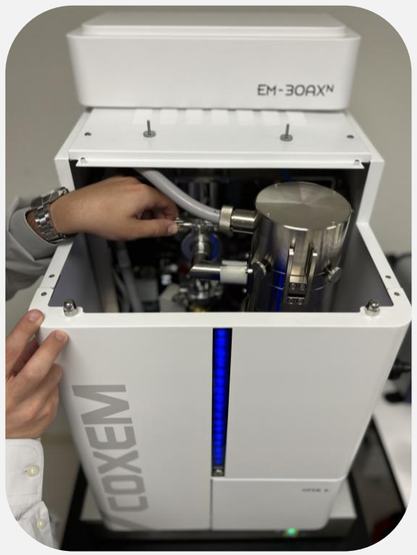
Buehler, Bruker, Ciqtek, COXEM, Leica, Navitar, Oxford, Olympus, Nikon, Semprex, Sensofar, Xavis

Call for other manufacturers

Extended Warranty

We offer extended warranties on most brands, providing:

- **Longer coverage** for peace of mind.
- **Expert repairs** using certified parts.
- **Minimized downtime** with priority service.
- **Optimized performance** through regular maintenance.



User Training/Process Development:

- Microscope Hardware & Software
- SEM Hardware & Software
- X-Ray Hardware & Software
- Sample Preparation
- Process Development

Products

Table of Contents

Forensic Microscopes

Digital Classroom

Education Microscopes

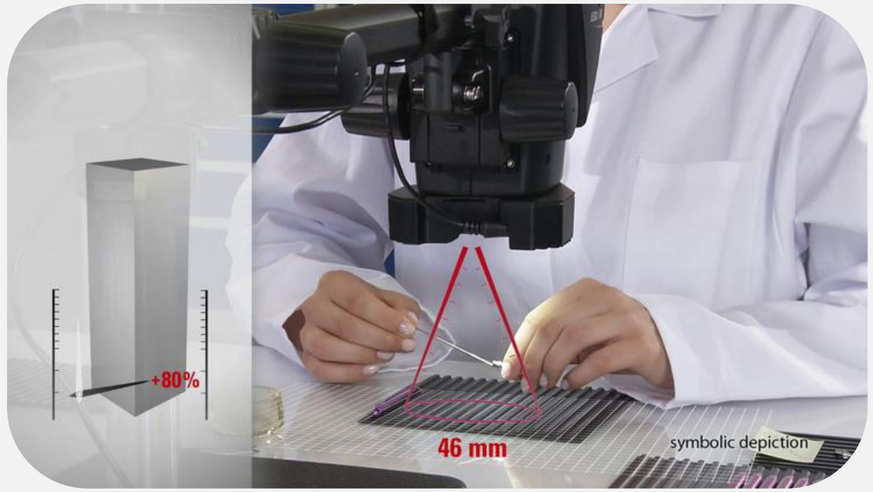
Compound Microscopes

Stereo Microscopes

Microscope Lighting

JH TECHNOLOGIES™

A Series



Increase your efficiency

For fast, comfortable and convenient work in production, assembly and rework.

Flexibility & Large Area Inspection

The table clamp allows maximum freedom of movement while requiring minimum table space. Ideal for handling large samples.

Ivesta 3 Series

Results you can rely on

Ensure consistent visual inspection according to standard procedures reducing the risk of human errors.

Facilitate inspection and measurement

Reproduce zoom settings through click-stops. Magnification settings are automatically saved along with the image data, using encoded zoom.

M 50/60/80/125 Series

Accuracy for repetitive tasks

Create traceable measurement procedures for repetitive jobs using the predefined zoom steps of the M50 or the click stops of the M60, M80. or M125

High flexibility with a modular concept

Customize the microscope to suit your needs with a large range of ergonomic accessories and illumination options

Working efficiently with Ergo accessories

Increase your productivity with an entirely ergonomic microscope for maximum comfort

Customizable for any application

Whether your work requires a variety of illumination techniques, different objectives, or a larger stand, let us help you choose the best solution for your application

M 165/205 Series

Tailored solutions – for those who demand more

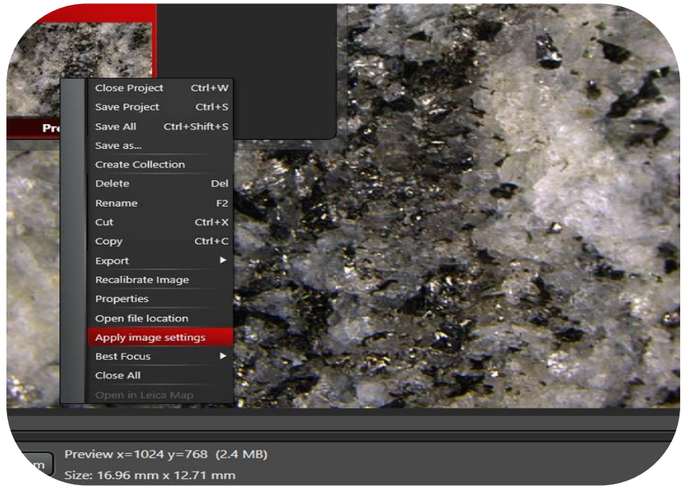
Automated solutions designed to increase thru-put with motorized stages, focus, and reproducible illumination

High flexibility with a modular concept

Customize the microscope to suit your needs with a large range of ergonomic accessories and illumination options

Easily acquire calibrated images

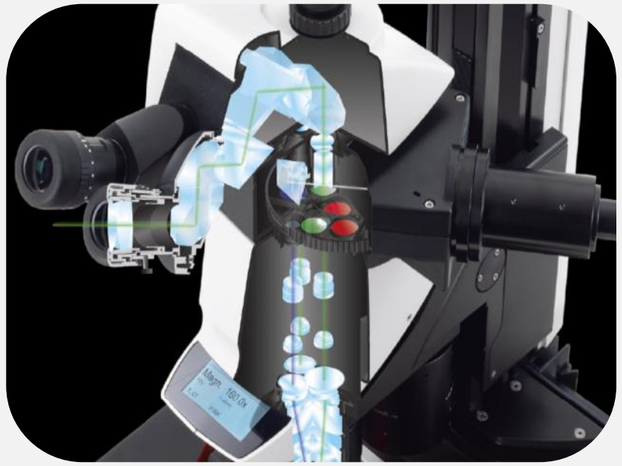
For accurate results and consistent documentation



Easily recall settings at any time

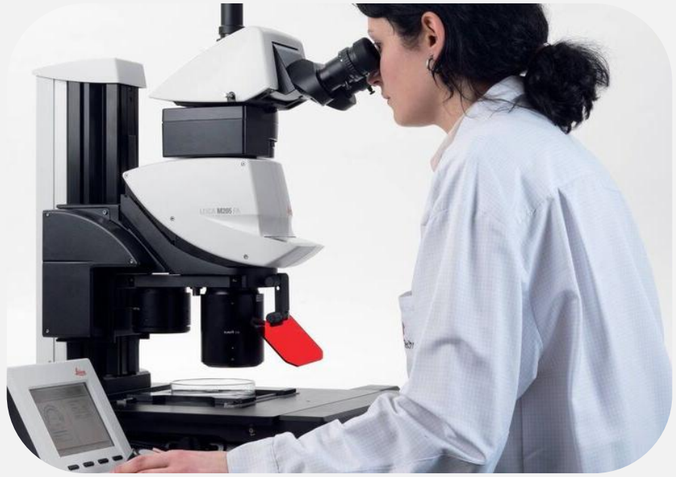
- Fully encoded systems for repeatability
- Simple, easy to use software to setup automated processes

- Research M 165/205 Series
- Routine M80, Ivesta Series



Discover the automated world of research

- Leica M205 FA: fully motorized fluorescence stereo microscope
- Revolutionizes fluorescence microscopy research
- Advanced automation capabilities



Bright fluorescence signals

- Separated yet synchronized beam paths
- Dedicated paths: one for excitation light, two for observation
- Evenly illuminated field of view at any zoom position

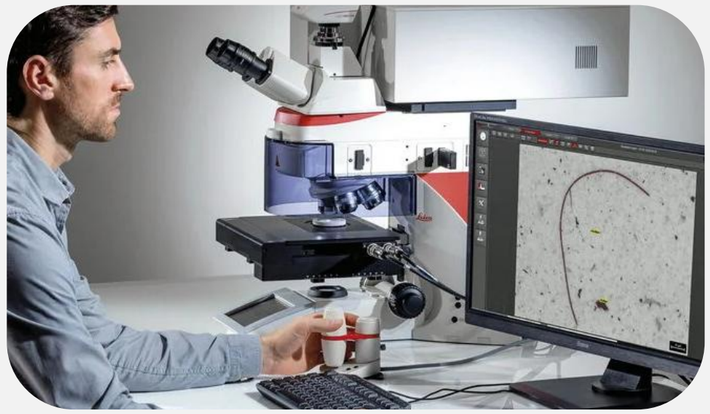
Finest details in 3D

- FusionOptics technology overcomes optical limitations
- Combines high resolution with excellent depth of field (DOF)
- Delivers superior image brightness for better 3D orientation

Fluorescence Routine Instrument

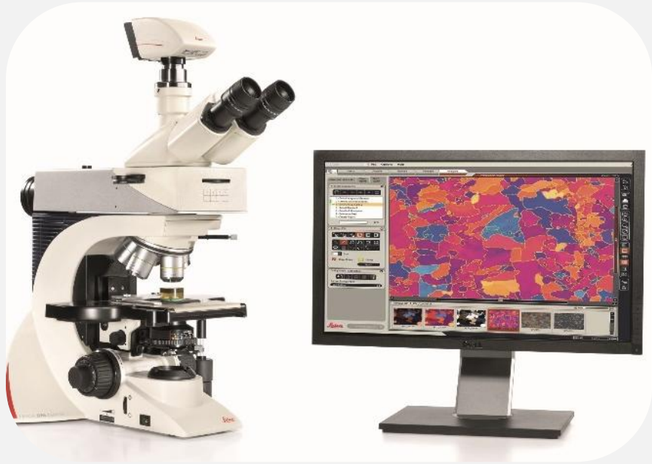
- LED light sources for basic instruments and routine applications
- Wide variety of configurations and wavelengths available
- Cost-effective solution for standard fluorescence needs

Cleanliness, Materials Science, Semiconductors



Cleanliness Analysis of Components

- Get particle composition and structure data simultaneously
- Make confident decisions faster during analysis



Upright microscopes for industrial and materials

- Inspect and document results efficiently
- Customizable with LED illumination and ergonomic accessories

Semiconductor Inspection Systems

Visualize Structures and Defects

- Detect, analyze, and measure scratches, contamination, and various features
- Choose from multiple illumination options: brightfield, darkfield, polarization, DIC, fluorescence, and infrared
- Enhance resolution with ultraviolet light

Quick Defect Detection

- Reveal macro defects using optional 0.7x Macro objective
- 36mm field of view enables fast orientation and efficient screening
- Save time with rapid sample assessment

JH TECHNOLOGIES™

Compound Microscopes

High-performance optics

- Superior image resolution and contrast using incident light, brightfield, polarization, and fluorescence
- Handles large samples efficiently
- Saves time during serial inspection and high-volume testing

Six contrast methods in one system

- Switch between samples 4× faster
- Accommodate samples weighing up to 30 kg
- Utilize UC-3D Illumination technology
- Achieve top resolution from any angle for more accurate inspection results

Large Working Distance

- Two-condensers option with flexible working distances:
  - s40/0.45 condenser: 40-50 mm working distance with 10 mm free space adjustment
  - s80/0.30 condenser: 80 mm working distance with simple installation
- No need to remove illumination arm when changing condensers

Compound Microscopes

Comparison Microscopes

- Detect and identify the slightest differences in forensic evidence
- Examine bullets, cartridge cases, tool marks, and documents with precision
- Ensure accurate, reproducible results for reliable conclusions

Flexibility with precision and reliability

- Adaptable with specialized object mountings:
  - Rotary stages
  - Large object stages
  - Tilting stages
  - Bullet holders
  - Various custom mounts
- Designed for versatility without compromising accuracy

Forensic Medicine

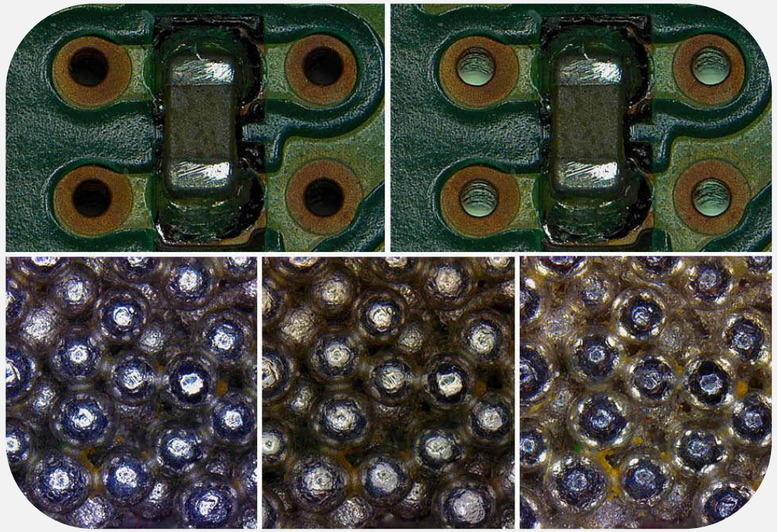
- Supports multidisciplinary applications: biology, pathology, anthropology, toxicology, and DNA analysis
- Features tailored microscopes, cameras, and software for effective lab work
- Offers versatile optics, illumination options, and specialized forensic software

Explore in a flexible way

- Ideal solution for failure-analysis and R&D applications
- Single versatile platform for multiple research need

Investigate your samples with ease

- Versatile digital microscope for comprehensive sample investigations
- Features convenient operation to maintain focus on work
- Ensures reliable results with reproducible imaging conditions

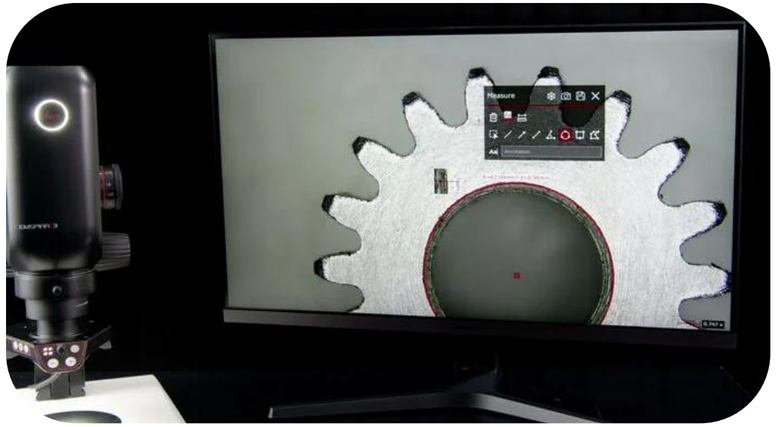


Reveal more details by combining options for illumination and contrasting in various ways.

- Ring light illumination (RL): View textured surfaces using one or all four segments
- Coaxial illumination (CXI): Visualize flat, reflective samples
- Transmitted light illumination (BLI): Explore holes and transparent materials
- Reduce glare on reflective samples with diffuser adapter or polarizer

Streamline your inspection process

The advantage of optimized inspection and adaptability to your needs combined in a single system.

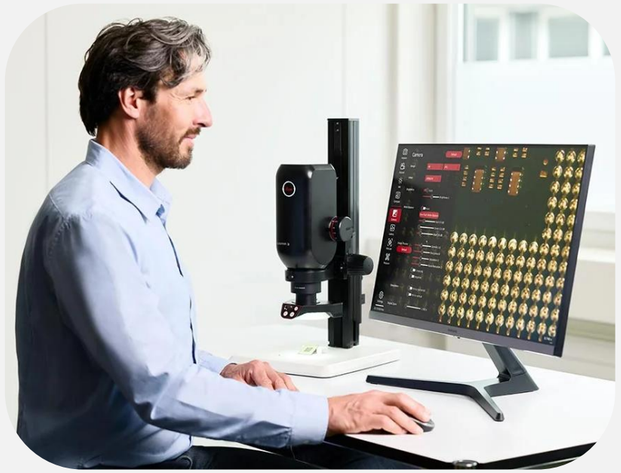


A flexible solution you can rely on

Flexibility to inspect and document according to your needs, access your data when you need it and work in industrial environments.

Get easy access to images

Create high contrast images and videos, reducing training and supervision time.



Measure and annotate directly without a PC

In stand-alone mode, you can measure multiple regions on the sample in the live image and save the results with it.

Education Microscopes

Compound Microscopes

- Precision optics with modern technology
- Integrated wireless camera for seamless documentation and viewing
- Exceptional clarity and ease of use
- Ideal for educational and routine laboratory applications

Dissecting Microscopes

A key instrument for your laboratory or classroom

- Essential instrument for laboratory or classroom settings
- Proper selection ensures long-lasting, satisfactory use
- Designed for extended dissection sessions by students and researchers

Wireless Classroom

- Digital Imaging Technology increases learning time and student engagement
- Interactive learning solutions include microscopes, cameras, and software
- Comprehensive ecosystem to enhance educational outcomes

Dissecting Microscopes

Educational stereo microscopes

The integrated 5-megapixel cameras can live-stream HD images to students' smartphones or tablets.

EZStore™ design

EZStore™ design with Handle and Cord Wrap allows easy carrying, easy lifting and easy cord storage

Camera access for multiple students simultaneously

Connect multiple smartphones or tablets and quickly access high-resolution images or videos fast directly onto your device through the camera's Wi-Fi stream.

Greenough Stereo Microscopes

You can optimize your visual inspection and rework while achieving reliable, consistent results with stereo microscopes.

Compound Microscopes

Student-friendly

Supports a Student Friendly Classroom Environment - Binocular, fluorescence-capable educational microscope for life science courses

AgTreat™

All touchpoints treated to prevent bacteria spreading from student to student

The EZLite™ LED Illumination

One of the teacher-friendly features, provides cool white light with a life-time of over 20 years average use.

Inverted microscope supports your specific work routine

The DMi1 camera version is an all-in-one solution for image capturing and cell culture documentation. The 12 mp camera transforms your microscope into a stand-alone digital imaging station with no need for a PC

Cameras

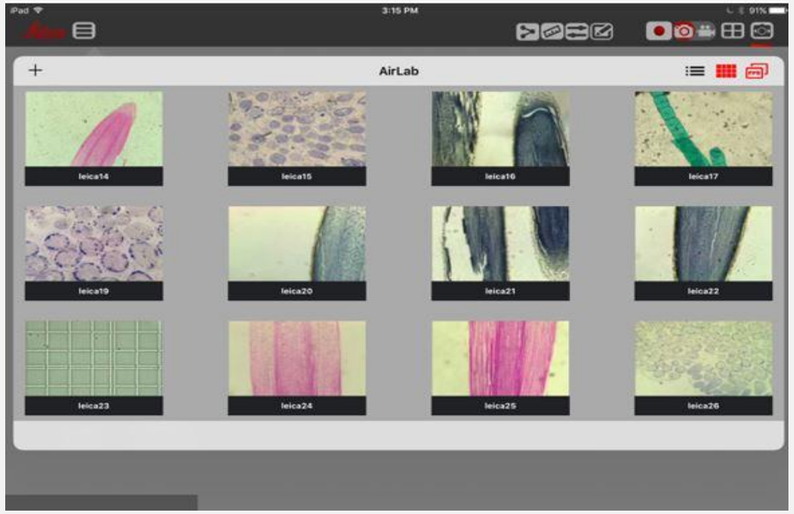
These 5-megapixel cameras can live-stream HD images to students' smartphones or tablets. Students can connect either through its own internal Wi-Fi signal or through the facilities network.

Leica AirLab App for easy learning and sharing

Capture, measure, annotate and archive microscope images with a mobile device.

Interactive Classroom with Airlab

Work with live image thumbnail overviews of all connected microscopes, share up to four images in class.



Live thumbnail overview AirLab

Overview all connected microscopes in class with a full-screen thumbnail overview.

Microscope Lighting

Ring Lights

- Durability (25,000 to 50,000 hours, depending on the model)
- A natural color temperature
- Low power consumption (compared to halogen lamps)
- The illuminator can have a very compact design
- Usually operated without a fan (no noise)

Incident Lights

Bright incident contrast

Integrated 4-point LED top light – ensures a homogeneous and bright incident illumination.

Diffuse/Polarized

Light characteristic
36 high-output LEDs produce bright, uniform light.

UV/Fluorescent

High-performance fluorescence with differential interference contrast, phase, and polarization contrast.

Microscope Lighting

Diffuse Ring Light

Spotlight illuminators are very useful for all kind of applications, where different contrast for reflected light is important.

Backlight

You benefit from bright, crisp images with distinct margins, injected directly into the microscope eyepieces.

Incident Light

With its flexible two-armed gooseneck and integrated LED spotlights, makes it easier for you to adjust the contrast for incident light.

Diffuse Dome Light

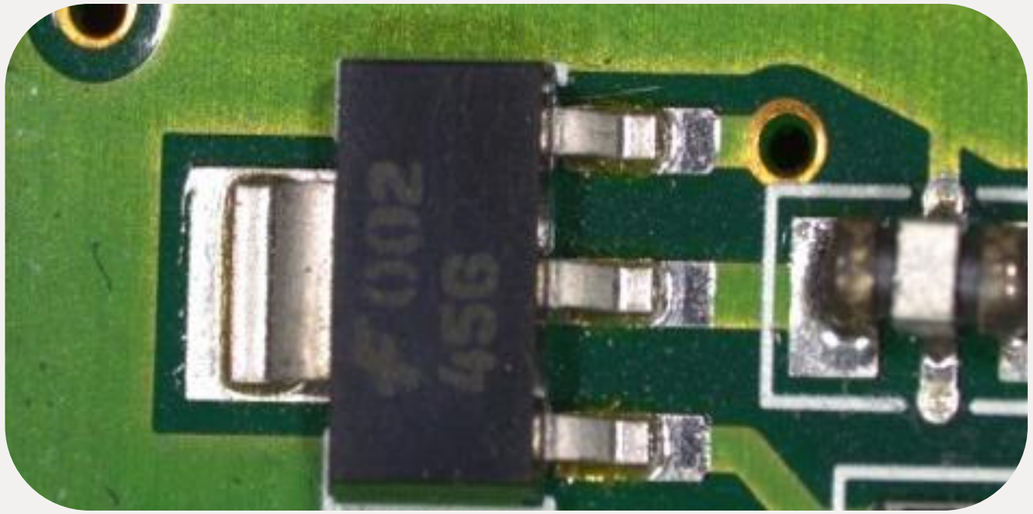
Produces a uniform light by means of the dome shape. The mechanically flexible design with silicone rubber eases your access to the specimen.

7- way LED illumination

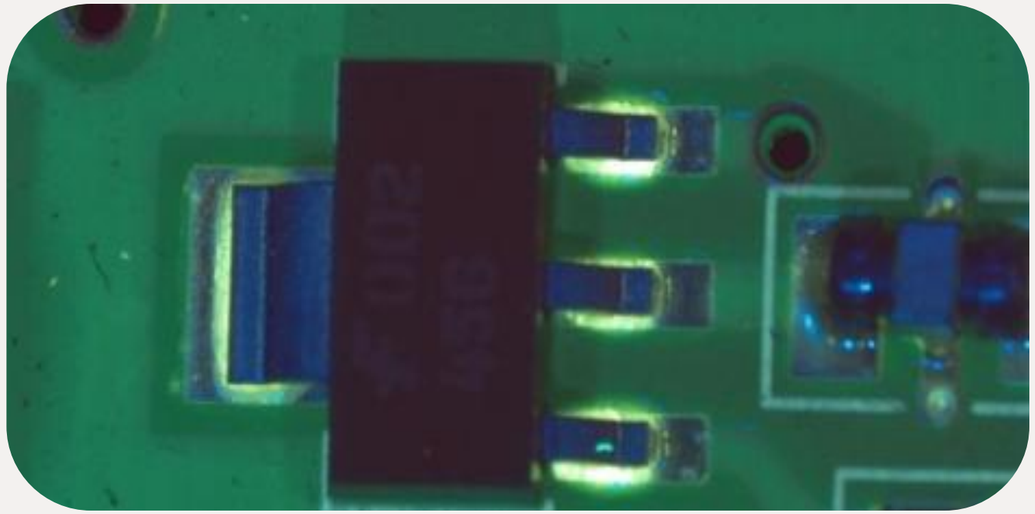
Provides incident, oblique and transmitted light for high quality illumination and contrast of any application.

Stereo Microscope Fluorescence Adapter

Allows you to easily add powerful fluorescent illumination to your Leica EZ4 or S9 Series Microscope



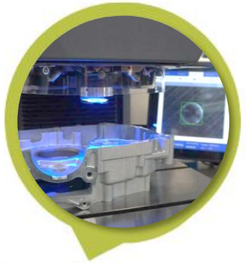
Standard Bright Field White Light LED



Blue Light Fluorescence Highlighting Epoxy

Metallography Equipment

GRINDING AND POLISHING

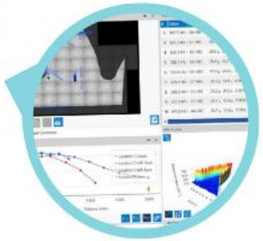


HARDNESS TESTING

METALLOGRAPHY SUPPLIES & CONSUMABLES

MOUNTING

SECTIONING



MATERIAL ANALYSIS & METALLOGRAPHY SOFTWARE

Gravity-fed Precision Sectioning Machine

IsoMet Low Speed

Manual Sectioning

IsoMet 1000

Low Speed Sectioning

PetroThin

Petrographic Sectioning

IsoMet High Speed

Automatic Precision Sectioning

AbrasiMet M

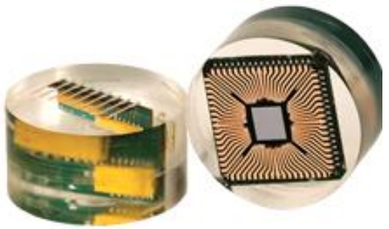
Manual Abrasive Sectioning

AbrasiMet L

Automatic Abrasive Sectioning

Compression Mounting Compounds

Acrylic Systems



Epoxy Systems

Simplivac

Cold Vacuum Mounting

Release Agent

Mounting Accessories

PetroBond

SimpliMet 4000

Hot Vacuum Mounting

EcoMet 30 Semi-Auto

The user-friendly touchscreen interface puts all regularly used functions on the simple front screen menus reducing process time.

IsoMet 30 Twin

All EcoMet/AutoMets have durable construction for reliability in high use environments, unique quick cleaning features, and plenty of enhancements for user-friendly operation.

VibroMet

Prepares high-quality polished surfaces on a wide variety of materials. Supports sample preparation for EBSD Analysis

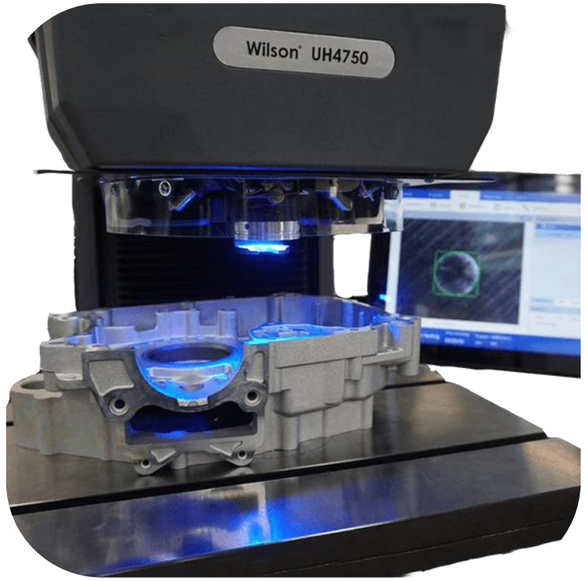
AutoMet 250/300

Designed for manual or automated sample preparation. Simplicity is balanced with versatility to accommodate many applications and larger areas.

Hardness Testing

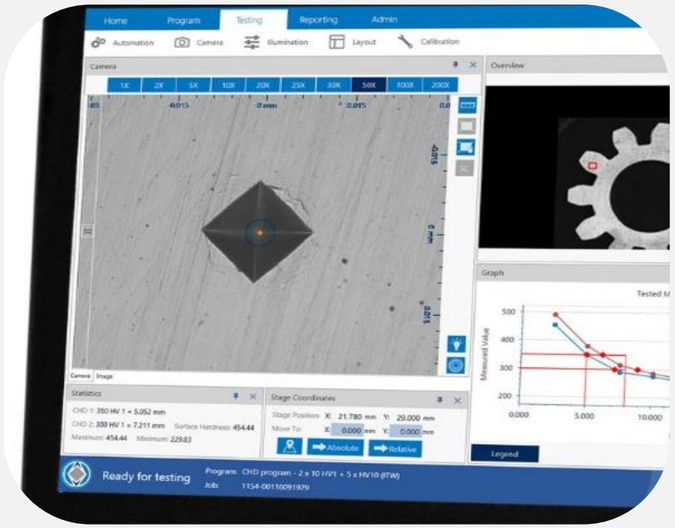
Vickers

- Vickers
- Vickers-Knoop
- Macro Vickers



Rockwell, Brinell, Universal

- Wilson Universal
- Wilson Rockwell
- Wilson Brinell



Accessories

- Diamet Testing Software
  - Offering varying levels of automation, comprehensive DiaMet software is a user-friendly system providing automatic test and measurement indentations, programmed testing sequences, and report generation.
- Test Blocks

Wilson Vickers & Knoop VH3300

- Fast and simple operation for inexperienced operators
- Maintains flexibility and advanced features for expert users
- Features DiaMet operation software for comprehensive testing

Wilson Vickers & Knoop VH3100

- Collision Resistant System prevents indenter and objective damage
- Fully integrated system with components and software designed by Buehler
- Complete hardness testing solution in one package

Wilson Micro Hardness VH1102 & 1202

- Versatile systems supporting both Knoop and Vickers testing methods
- Affordable and reliable solution for precise micro-hardness testing
- Suitable for quality control and metallurgical research applications

Wilson Universal Hardness Tester UH4000

Can perform several different hardness scales in one machine including Vickers, Knoop, Brinell and Rockwell, in most cases at higher loads

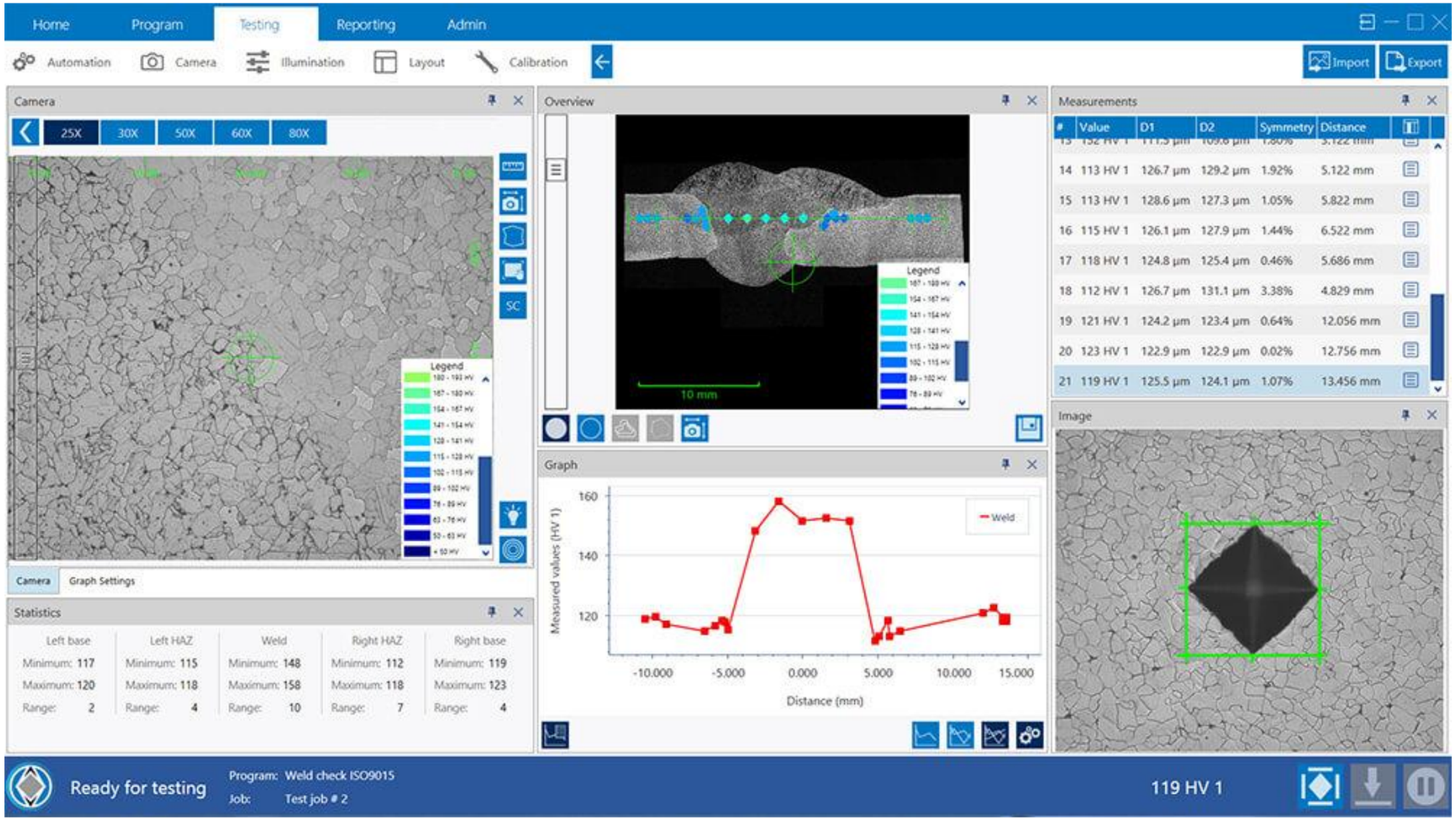
Wilson Rockwell 2000 Hardness Tester

Achieve the highest level of depth measurement accuracy and resolution available and as a result has the best GR&R performance in the industry.

This machine is offered in two sizes ranging from 10 - 14 in of vertical testing capacity to accommodate varying sample sizes and is available in three different variations of Rockwell Regular, Superficial, or Twin hardness scales.

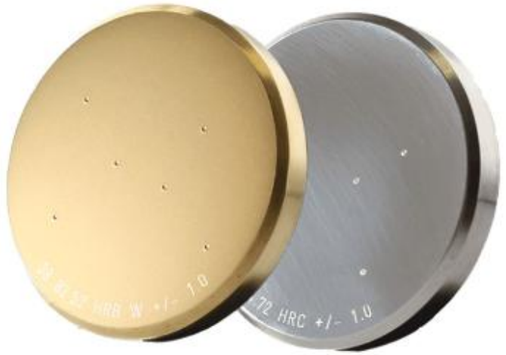
Wilson Brinell Hardness Tester BH3000

Designed with rugged construction to withstand harsh environments, the reliable BH3000 Brinell hardness testing machine combines high rigidity and closed-loop load cell technology to ensure accurate and safe
load applications.



Diamet Hardness Testing

DiaMet hardness testing software breaks from the usual approach by offering a fast and simple way to perform hardness tests. This makes it easy for less experienced operators to use, while still providing the flexibility and advanced features that expert users need



Wilson Rockwell Test Blocks

- We work directly with the steel and brass mills to specify the chemical composition.
- Our machining processes (grinding, lapping, polishing) are all done in house, at the site of calibration.

Wilson Vickers & Knoop Test Blocks

100% inspection to ensure that every single test block meets the physical requirements of ASTM (thickness, flatness, parallelism, surface roughness).

Rockwell Hardness Testing Calibration Kits

Contain three test blocks (low, medium, and high), an indenter, and a case. Each component can also be purchased separately and has its own part number.

Wilson Brinell Test Blocks

- Uniform material
- Grid pattern supports NADCAP compliance
- Large block size

Consumables for Material Preparation Testing and Analysis

- Sectioning
- Mounting
- Grinding & Polishing
- Hardness Testing

Full Lab Metallography Solutions

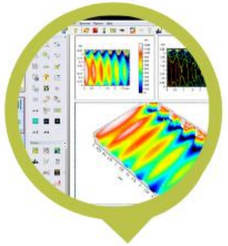
- Grinding and polishing discs
- Precision sectioning blades compatible with most manufacturer's equipment
- Polishing compounds for virtually any application
- Epoxy or Acrylic based mounting compounds
    - 2 –part, heat cured, and compression technologies

Buehler Image Analysis Image Software

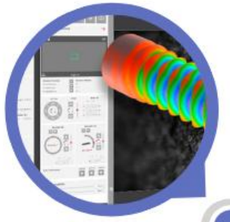
- Flexible platform with pre-configured software or hardware packages and optional accessories
- Optional Capture and Measurement Modules available to customize software solution
- Any standard format image may be viewed directly from a calibrated microscope or be imported into OmniMet for analysis

86-1-1001	86-1-1000	**OmniMet Viewer** allows networked users to view and modify images and information in an Omnimet database on the same network.
	86-1-1010	**OmniMet Capture N' Measure (CnM)** enables image capture with basic measurement functions and scale bar (without database functions). Measuring tools include length, parallel lines, curved line, area, perimeter, radius, angle and count. Images can be saved in common formats. Results can be burnt into the image but cannot be stored or exported to Excel®.
86-1-1003	86-1-1002	**OmniMet Basic** includes everything in Capture 'N Measure, and also adds databasing functionality for archiving as well as MS Office report templates for presenting results. Optional Capture Modules may be added for specific applications.
86-1-1005	86-1-1004	**OmniMet Advanced** includes everything in OmniMet Basic, and also adds enhanced measurements capabilities. Measurements can be saved in the database, or interactively to Excel worksheets. Built in statistical analysis streamlines interpretation of results and reporting. Optional Capture Modules and Advanced Measurement Modules may be added for specific applications.
86-1-1007	86-1-1006	**OmniMet Express** includes everything in OmniMet Advanced, with the added capability of running automated Scripts. Scripts are application specific image analysis packages to provide best efficiency and reproducibility for repeat analysis in high throughput environments. Optional Capture Modules, Advanced Measurement Modules and pre-programmed Application Specific Scripts may be added.
86-1-1009	86-1-1008	**OmniMet Enterprise** includes everything in OmniMet Express, with the added capability of writing and editing Scripts. Fully customizable Scripts allow the user complete control of analysis solutions. Comes with 8 commonly used Application Specific Scripts. Optional Capture Modules, Advanced Measurement Modules and additional Application Specific Scripts may be added.

NANO PROFILING

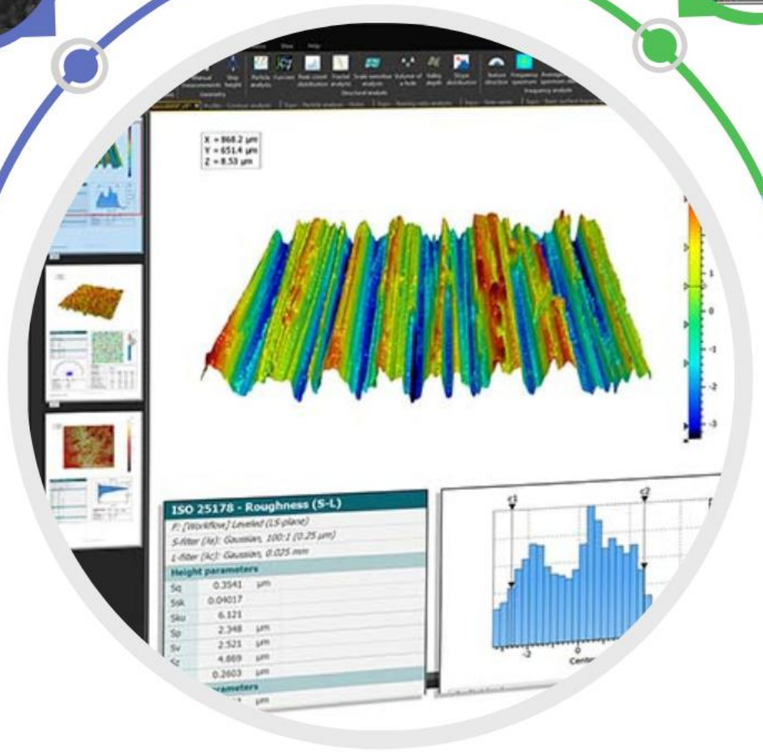


PRECISION SURFACE PROFILING



LARGE FORMAT PRECISION PROFILING

VISION MEASUREMENT SYSTEM



MEASURING MICROSCOPES

Vision Measuring Systems

- Manual
- Semi-Automated
- Automated
- 2D & 3D

QuickScope & Quick Image

- Manual/Semi-Auto
- Errors due to focusing are eliminated
- Simple execution of multiple measurements

Mitutoyo Quick Vision Active

Compact CNC Vision combines the flexibility of multiple zoom lenses with touch probe capability to provide a versatile measuring system

- Programmable LED stage and coaxial light
- 4-quadrant LED ring light
- High-resolution and high-speed color camera

Quick Vision Hyper

- Programmable Power Turret (PPT)
- Tracking Auto Focus (TAF)
- Programmable Ring Light (PRL)

Quick Vision Stream Plus

Innovative vision measuring machine that gains images without stopping the stage.

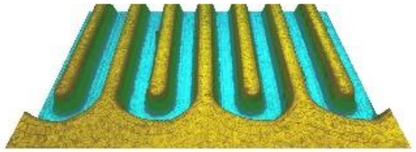
Sensofar S neox

Configurations available:

- Confocal
- Interferometry
- Focus variation
- Layer Thickness

Sensofar S lynx 2

Compact precision surface profiling featuring nano-scale accuracy at an affordable cost



Sensofar S neox Grand Format

A high-performance, non-contact 3D optical profiler designed for advanced surface metrology applications of large panels in semiconductor, display, and PCB industries.

The S neox Grand Format Cleanroom provides three different optical technologies to image with the most suitable technology for each specific sample, achieving precision down to subnanometer levels.

Sensofar S wide

The S wide system uses Fringe Projection technology to quickly acquire large-area measurements with high vertical resolution. It includes analysis tools to extract data on roughness, flatness, critical dimensions, GD&T, and CAD comparisons.

Sensofar S neox Five Axis

Optical profiler combines a high-accuracy rotational module with the advanced inspection and analysis capabilities of the S neox 3D optical profiler. This enables automatic 3D surface measurements at defined positions which can be combined to create a complete 3D volumetric measurement.

Toolmakers Measuring Microscope

Well suited for measuring dimensions and angles of machined metals.

Manual Measuring Microscope

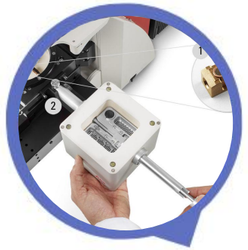
- Measure multiple workpieces simultaneously
- Simple go/no-go judgment of multiple workpieces
- Generate reports and observe all in one instrument

Motorized High-accuracy Measuring Microscope

User-friendliness, high measurement data throughput, and environmental friendliness

Electron Microscopy & Sample Prep

COATING, FREEZE FRACTURING, & SAMPLE TRANSFER



CRYO PREPARATION SYSTEMS & CRITICAL POINT DRYER

ION BEAM MILLING

TRIMMING & MECHANICAL PREP

SCANNING ELECTRON MICROSCOPES

ULTRAMICROTOMES, CRYO ULTRAMICROTOMES, & CONTRASTING

EM-30N Table-top SEM

With specifications and capabilities not matched by any other SEM in its price range. After evaluating the EM-30 Series your search will be over to find the best compact SEM available.

CX-200K Compact SEM

The standard supplied configuration of the CX-200plus includes both SE and BSE imaging detectors and an internal chamber view camera for easy stage tilt and height adjustments.

EM-40 Table-top SEM

New standards for compact, benchtop, and desktop SEMs by offering you advanced features typically found only in larger, more expensive models.

CX-300K Compact SEM

Up to 100mm X,Y travel in a compact size

Focused Ion Beam SEM (FIB-SEM)

The CIQTEK DB550 is an advanced Field Emission Scanning Electron Microscope (FE-SEM) with Focused Ion Beam (FIB) capabilities, offering comprehensive nano-analysis and fabrication in a single workstation.

Full Size Field Emission SEM

The CIQTEK SEM5000X is an ultra-high resolution Field Emission Scanning Electron Microscope (FESEM) with optimized electron optics that reduce aberrations by 30%, enabling 0.6 nm resolution at 15 kV.

Full Size Tungsten SEM

The CIQTEK SEM3300 is a next-generation tungsten filament scanning electron microscope that combines in-lens electron detectors with electrostatic and electromagnetic compound objective lenses, enabling low-voltage analysis previously only available in field emission SEMs.

EM TIC 3X

Allows production of cross sections and planar surfaces for Scanning Electron Microscopy (SEM), Microstructure Analysis (EDS, WDS, Auger, EBSD) and, AFM investigations.

EM TRIM2

High-speed milling system with an integrated stereomicroscope and LED ring illuminator for trimming biological and industrial samples prior to ultramicrotomy.

CP-8000+

An advanced sample preparation tool that etches a cross section of a sample using an argon ion beam.

EM TXP

Target Surfacing System, target preparation device for milling, sawing, grinding, and polishing samples prior to examination by SEM, TEM, and LM techniques.

EM ACE200

Low vacuum sputter and carbon thread coater, producing homogenous and conductive metal or carbon coatings for SEM and TEM analysis was never before more convenient

EM ACE600

High vacuum sputter coater processes yield reproducible results you can trust and enable you to increase your sample output with every run.

SPT-20

The SPT-20 Sputter Coater is a compact ion coating system ideal to support table-top SEM's. The system is able to sputter noble metals such as gold (Au), palladium (Pd), platinum (Pt), and silver (Ag) for non-conductive or poorly conductive specimens.

EM ACE900
Freeze Fracture System

- Cold shield around the sample avoids water molecules freezing onto your sample
- Accurate temperature control during the complete process
- Clean Knife – fresh blade for each cut avoids contamination

EM CPD300: Critical Point Dryer

- Automated drying system for biological and industrial samples
- Delivers consistent high-quality specimen preservation
- Features safe waste disposal system with no user contact

Leica EM VCT500

- Stay Connected
- Connect your workflow systems
- Optimize your sample transfer thanks to the active sample cooling and new valve concept
- Monitor your sample with respect to temperature and vacuum at any time during the workflow when docked

EM UC7

Ultramicrotome provides easy preparation of semi- and ultrathin sections and perfect, smooth surfaces of biological and industrial samples for TEM, SEM, AFM, and LM examination.

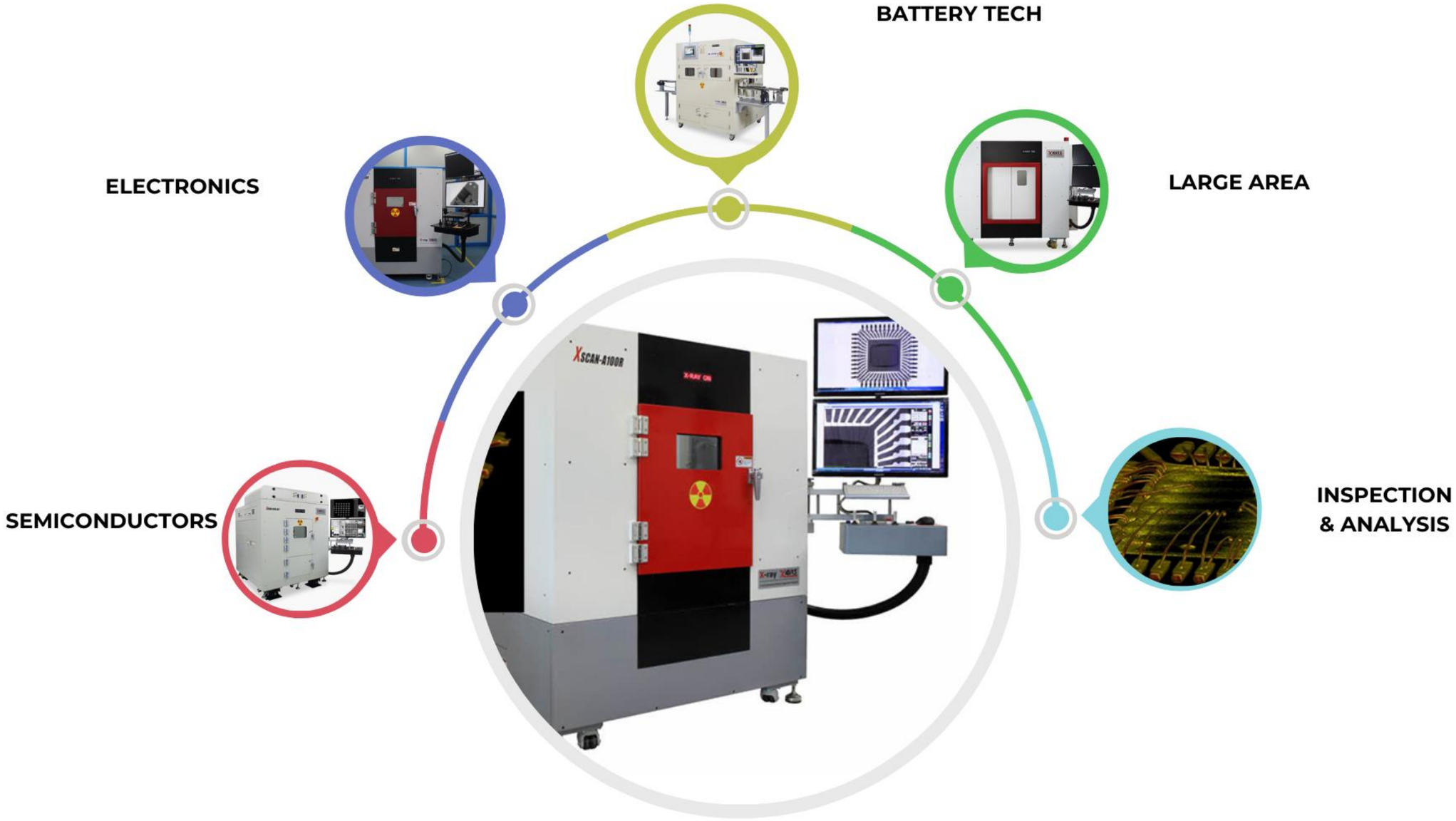
EM FC7 Cryochamber

- Full control integration with the EM UC7 touchscreen control panel
- Highly stable temperature regulation and low LN2 (liquid nitrogen) consumption

Three different cryo-modes available for use:

1) standard, 2) high gas flow, and 3) wet cryo-sectioning

X-Ray Imaging



X-Ray Imaging

X-ray systems for Electronics

The XSCAN-A series consists of four advanced X-ray inspection systems (A100R, A130H, A150, and A100W).

X-Ray systems for Battery Technology

The XSCAN-9000 series offers four specialized X-ray inspection system variants (Prismatic, Cylindrical, Polymer, and Polymer Stack) designed for comprehensive battery and condenser inspection.

X-ray systems for Semiconductor

The XSCAN-H series offers three high-powered X-ray inspection systems (H130-OCT, H160-OCT, and H160M) featuring hybrid 2D/3D inspection capabilities with automation technology.

X-Ray systems for large area applications

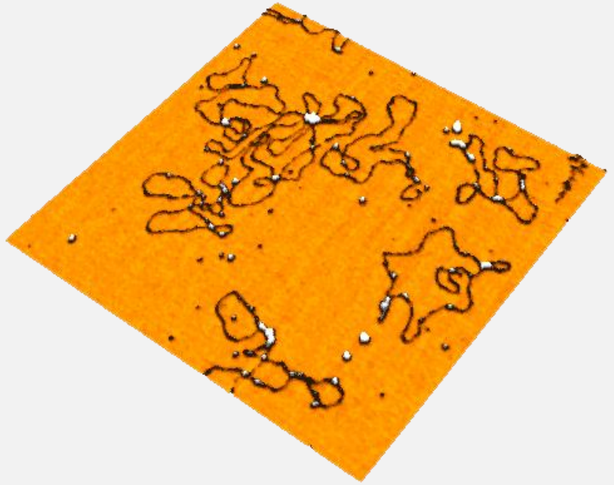
The XSCAN C series encompasses four high-powered X-ray inspection systems ranging from 150kV to 225kV, designed for large-scale industrial applications.

X-ray systems for Electronics

The Nano-Observer II combines exceptional performance with user-friendly operation, offering researchers a cutting-edge AFM solution for nanoscale imaging and characterization across multiple scientific disciplines.

- **User-Friendly Design** - Efficient pre-approach visualization
- **High-Performance Scanning** - Consistent resolution at all scales
- **Advanced Modes** - Revolutionary electrical characterization capabilities
- **Open Architecture** - Optical microscopy integration ready
- **Application Versatility** - Multi-discipline research compatibility
- **Specialized Techniques** - Gentle analysis for delicate samples

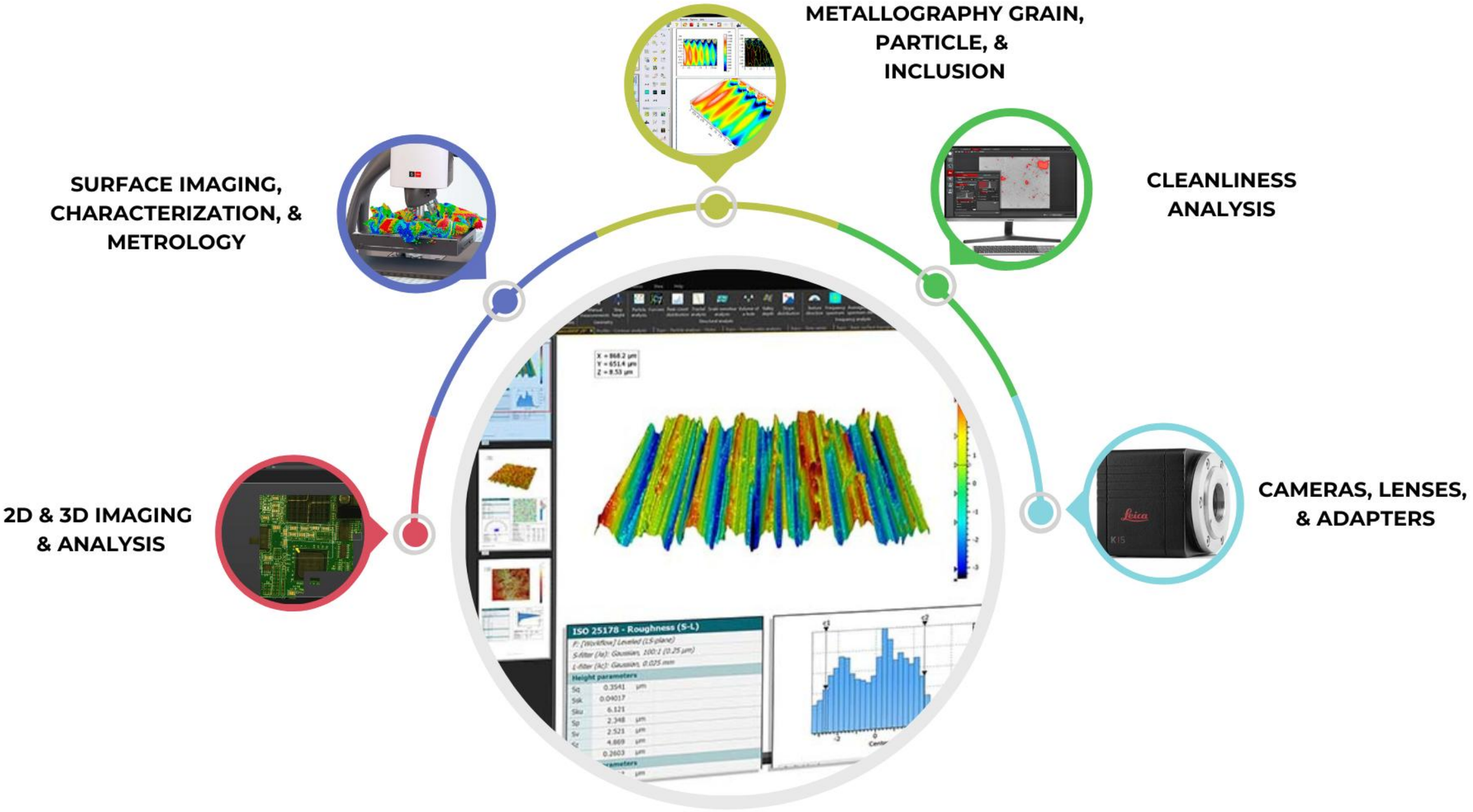
Multiple AFM Modes



Applications

- Materials Science
- Semiconductors
- Biology
- Polymers
- Energy Materials
- 2D Materials

Cameras, Lenses, Software & Imaging

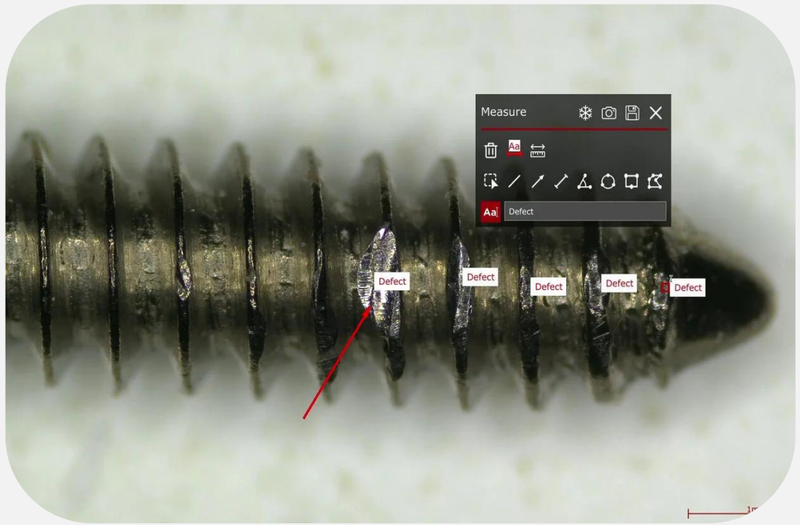


Enersight Microscope Software Platform

- Eliminates hassle of navigating different software across workstations
- Streamlines quality control and inspection workflows
- Unified platform for consistent operation

Consistent operation that saves you time

- Common interface works across multiple operation modes
- Features on-screen display (OSD) functionality
- Reduces learning curve and improves efficiency

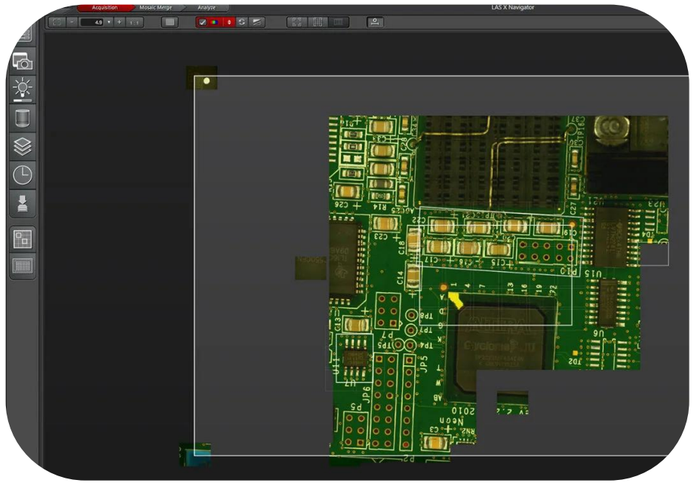


Inspection and Quality Control

- Simplifies and streamlines inspection and documentation workflow
- Provides consistent, easy-to-use interface for all quality processes

Streamline your inspection process

- All-in-one integrated software solution
- Improves inspection efficiency through streamlined tools
- Easily compare, measure, and share data across systems

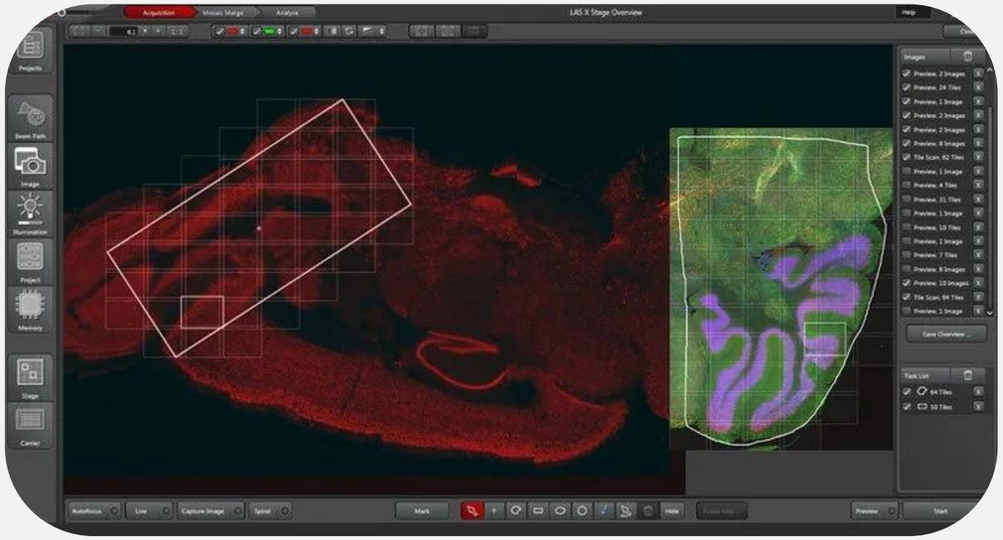


Leica LAS X

- LAS X Live Image Builder
- LAS X Z-Control & SW Autofocus
- LAS X Extended Depth of Field
- LAS X Stitching
- LAS X 3D Surface Viewer
- LAS X 3D Surface Measurements

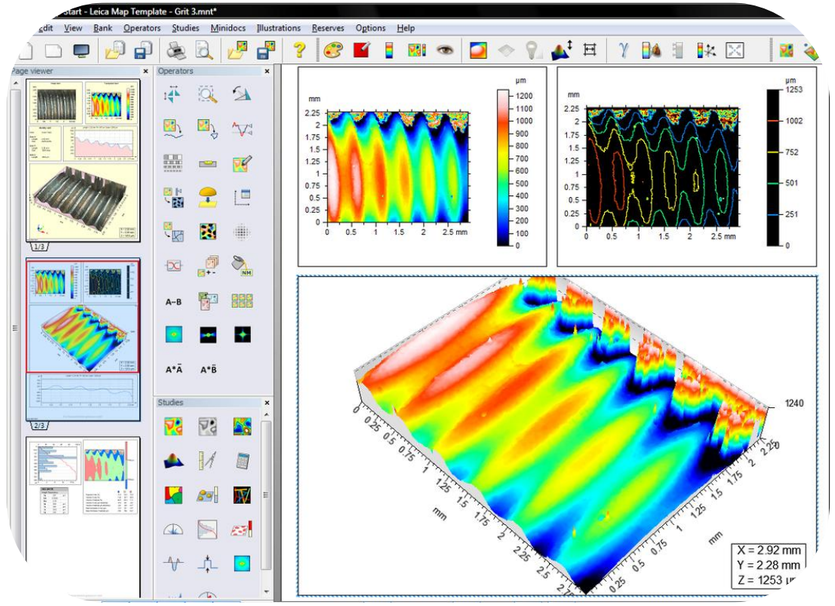
Manual Measuring Microscope

- Measure multiple workpieces
- Simple go/no-go judgement of multiple work pieces
- Generate reports all in one



LAS X Life Science Microscope Software Platform

The one software platform for all Leica microscopes: It integrates confocal, widefield, stereo, super-resolution, and light-sheet instruments from Leica Microsystems.

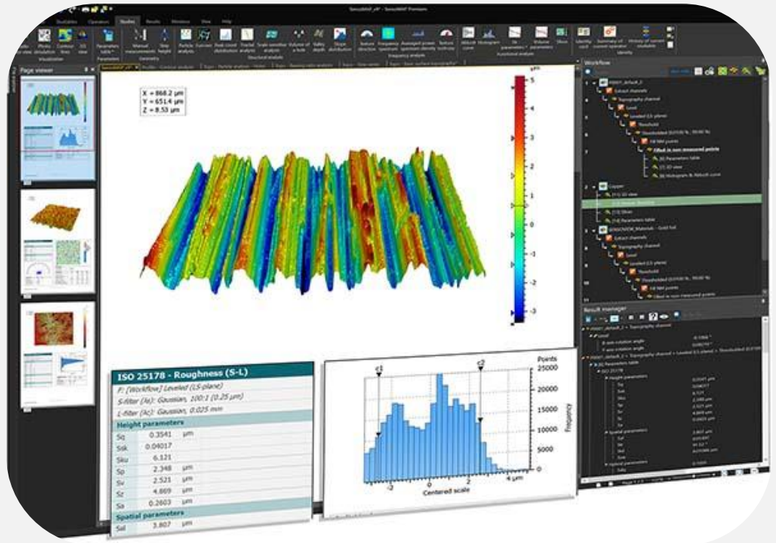


Leica Map is used for viewing and analyzing surface geometry and surface texture from LASX depth map images.

Capabilities include 3D visualization of surfaces, characterization of basic surface features and calculation of surface texture parameters.

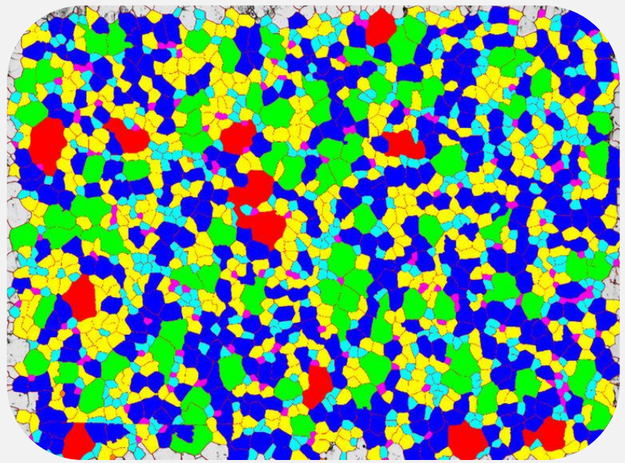
SensoMAP
Advanced Analysis Software

Based on Mountains technology from Digital Surf, which is an extremely powerful tool for analysis and reporting. Software provides 3D visualizations and characterization of surface features.



Metallography Imaging & Analysis

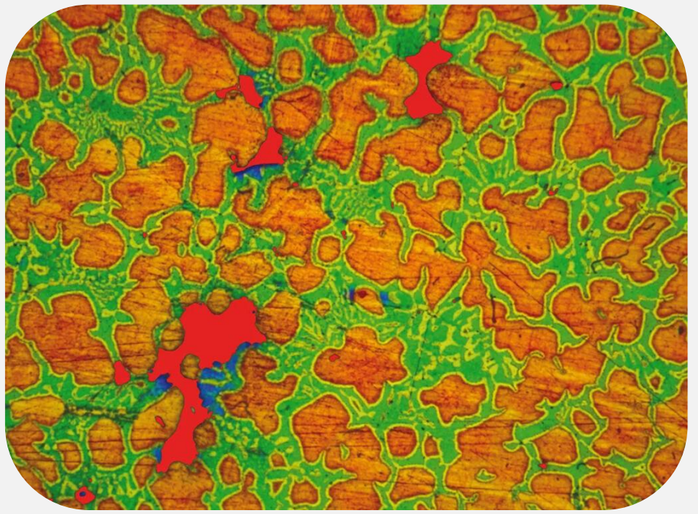
LAS X Modules



Cast Iron and Grain Expert

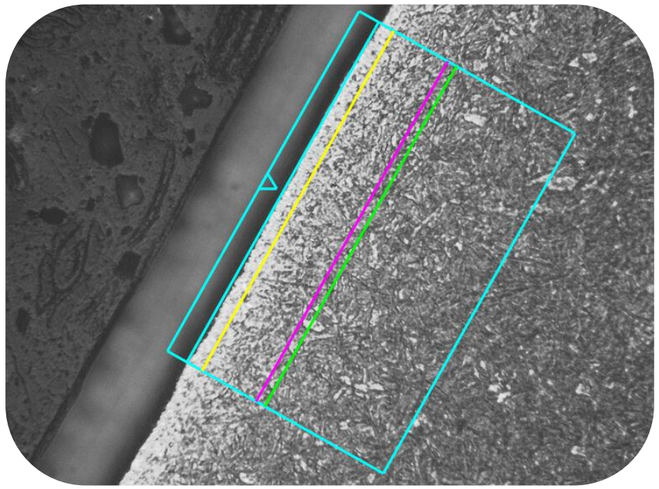
Identify graphite nodules and place them in size classes.

Analyze grain size to evaluate the properties of materials.



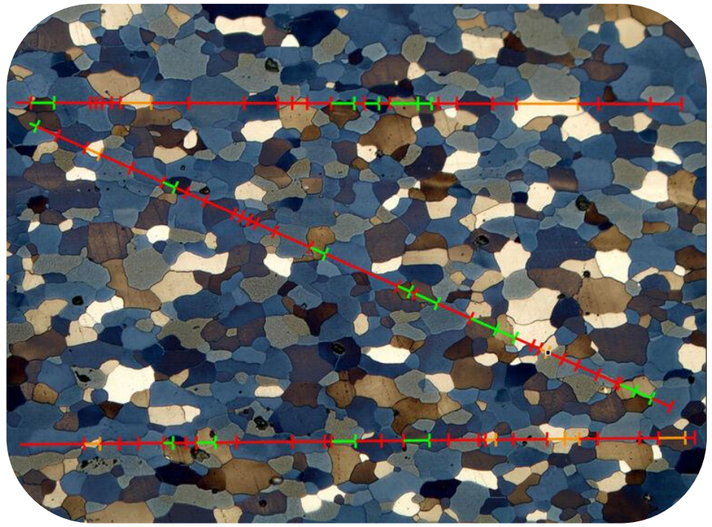
Phase Expert

Measure multi-phase microstructures identified by their distinctive color or contrast in materials.



Decarburization

identify and analyze the depth of non or low-alloyed steel.

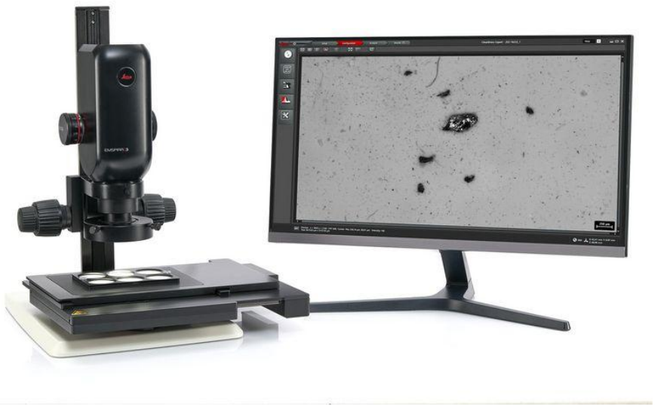


Metallography Toolbox

Assess, analyze, and measure metals, alloys, layers and coatings, adhering to laboratory requirements by incorporation analysis methods utilized in industry standards.

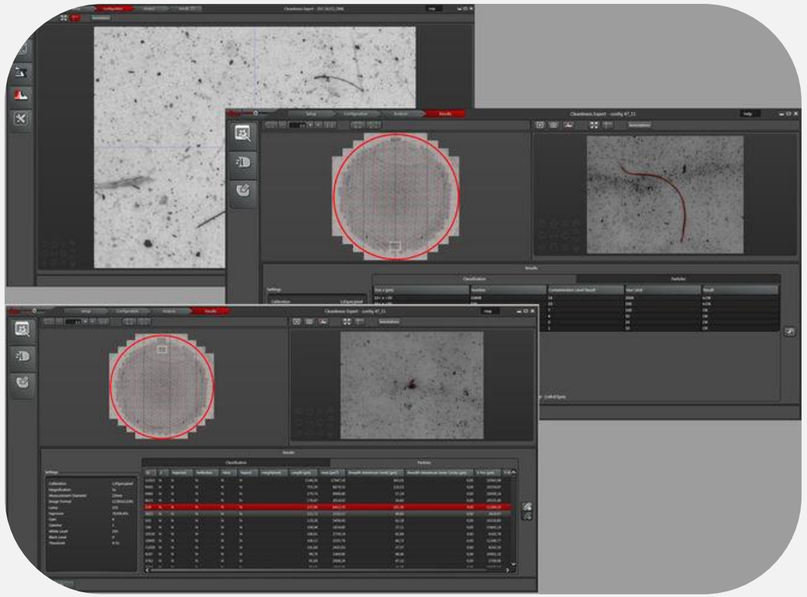
Target contamination fast

Cleanliness analysis systems from Leica Microsystems offer optimized software and a unique 2-in-1 solution for visual and chemical analysis.



Your benefits

- Increase throughput by analyzing more in less time.
- Obtain more insights on the source of particles for better risk assessment and more confident decisions.
- Meet all your current needs and be prepared for changing requirements.

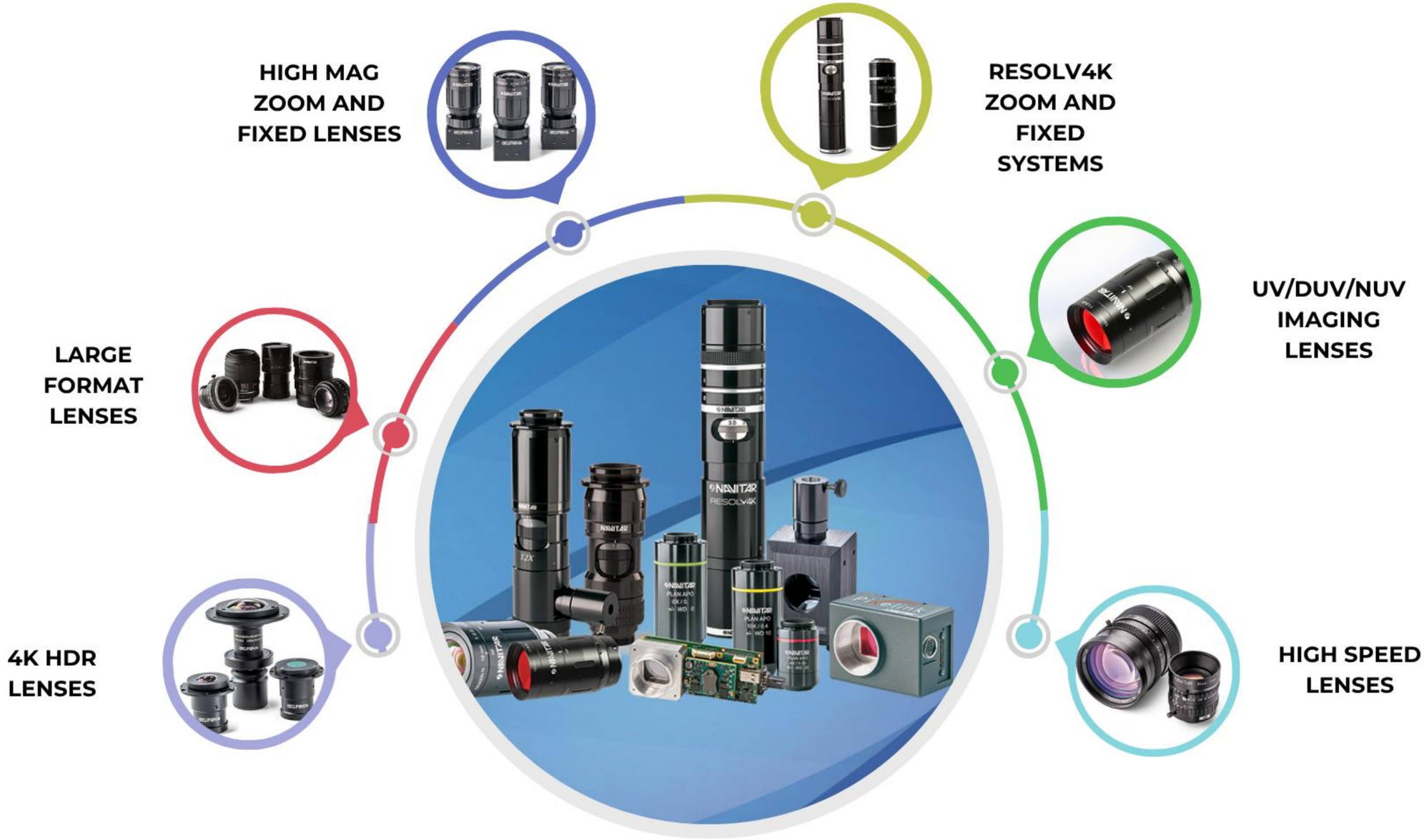


Ensure you get your cleanliness analysis results more efficiently:

- Save 30% of your filter sample scanning time for particle sizes between 5 - 10 micrometers.
- For particle sizes over 25 micrometers, you can scan particles on filter samples 3 x faster.
- Identify the reflective particle on your filter sample faster and calculate the circular diameter of irregularly shaped particles with improved speed thanks to optimized algorithms.

Camera Name	Flexacam C5	Flexacam i5 (stereo)	Flexacam i5 (compound)	K3C	K3M	K5C
Article Number	1270536	12730536	12730537			
						
Application	Education + Routine			High End Single Shot -Documentation and Analysis		
Resolution	■■■	■■■	■■■	■■	■■	■■■■
Speed	■■■	■■■	■■■	■■	■■	■■
Sensitivity	■■	■■	■■	■■■■	■■■■	■■■■
Interface	USB3	USB3	USB3	USB3	USB3	USB3
Type of Sensor	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Surface Diagonal	7.81 mm	7.81 mm	7.81 mm	8.92 mm	8.92 mm	15.86 mm
FPS	60	60	60	15	21 (HW Trigger)	32
Cooling	No	No	No	No	No	No
A/D Converter	12 Bit	12 Bit	12 Bit	12 Bit	12 Bit	12 Bit
Exposure Time	1ms-125 ms	1ms-125 ms	1ms-125 ms	1ms-10s	1ms-10s	1ms-10s
Largest Capture	12 MP	12 MP	12 MP	6 MP	6 MP	20 MP
c-Mount Adapter	0.5x/0.55x	internal,0.5x	internal,0.5x	0.5x/0.55x	0.5x/0.55x	1.0x
Software PC	Enersight Desktop	Enersight Desktop	Enersight Desktop	LASX	LASX	LASX
Software Mac	-	-	-	Acquire	Acquire	Acquire
	Flexacam C5	Flexacam i5 (stereo)	Flexacam i5 (compound)	K3C	K3M	K5C

Typically used for in-process inspection, high-speed imaging, imaging in vacuum chambers, or utilizing right angles for hard to image areas.




WORK BENCHES
MICROSCOPE STANDS
MICROSCOPE STAGES
CAMERA COUPLERS
DIGITAL/VIDEO CAMERAS
VIBRATION TABLES
flexacam c5
LEICA M80
SENSOFAR

COLOR CHART & WHITE BALANCE

PARFOCALITY ADJUSTMENT FOR ALL MICROSCOPES

BEWARE OF "EMPTY" MAGNIFICATION

RESOLUTION TEST CHARTS & HISTORY

RESOLUTION CAPABILITIES

MIL TO MICRON CONVERSION TABLE

Resolution Capabilities

1. Human Eye (Unaided)

Maximum resolution:
Around 0.4 nm
(100 micrometers)

2. Stereo Microscope

Also known as a Dissecting Microscope

Maximum resolution:
Around 1 micrometer (1,000 nanometers)

3. Compound Microscope

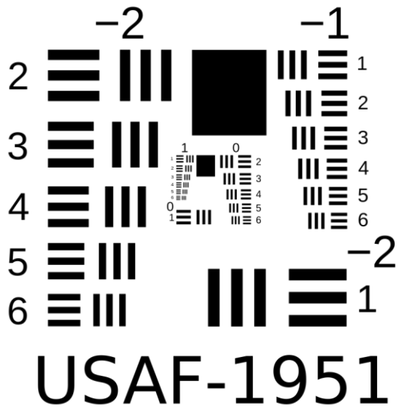
Also known as an Optical Microscope

Maximum resolution:
Around 0.2 micrometers (200 nanometers)

4. Scanning Electron Microscope (SEM)

Maximum resolution:
Around .5 nanometers
(0.5 billionths of a meter)

Resolution Test Charts & History



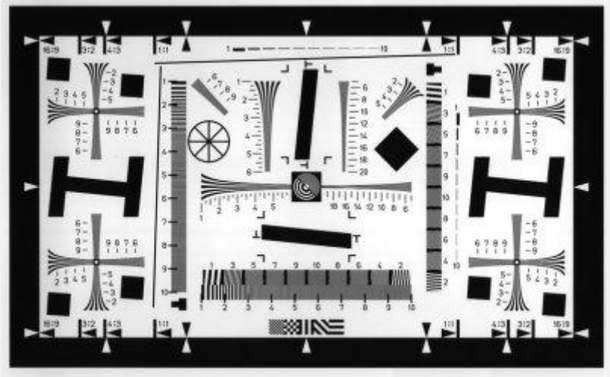
Resolution test charts have been used since the late 19th century to evaluate and calibrate the resolving power of imaging systems such as microscopes, cameras, and optical devices.

The 1951 USAF resolution test chart, defined by MIL-STD-150A, features stepped spatial frequency patterns and is widely used in optical engineering to assess resolution in microscopes, cameras, and scanners.

In the 1960s, the National Bureau of Standards (now NIST) introduced the NBS 1963A Microcopy Resolution Test Chart, designed to assess resolution, contrast, and distortion.

Other charts have been developed for specific uses, including the ISO 12233 Resolution Test Chart for digital cameras and the SEMI P28 Resolution Target for semiconductor inspection.

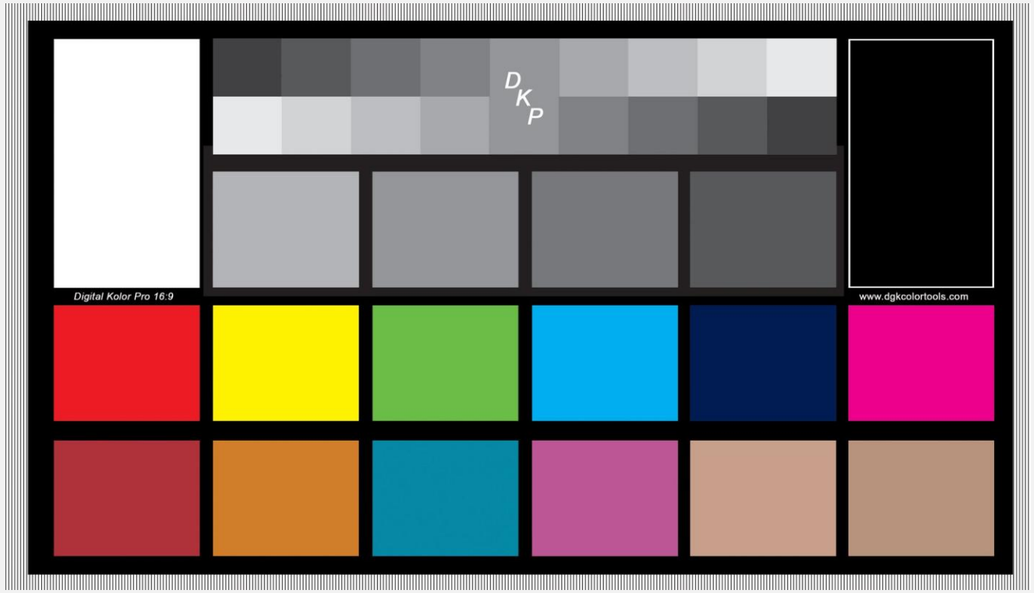
Today, resolution test charts remain essential tools across microscopy, photography, printing, and imaging industries to ensure consistent, high-quality imaging performance.

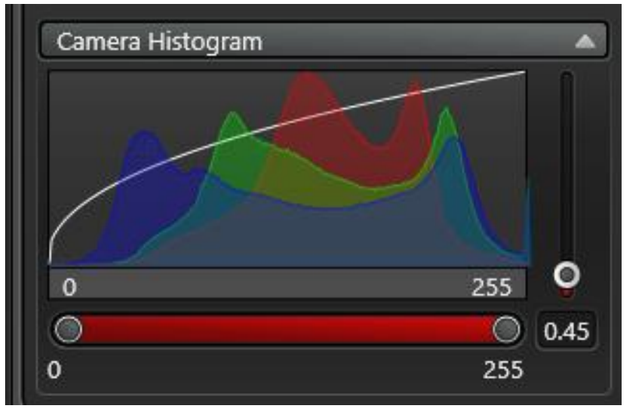


White Balance – What It Is and Why It Matters
A camera setting that defines what “true white” looks like under current lighting. It sets a baseline for all other colors, ensuring accurate, natural-looking images. Since white doesn’t always appear white in different lighting, this correction is essential.

What It Does:

- Applies to both photography and videography
- Adjusts all colors based on a defined “white”
- Prevents yellowish or bluish color casts





How It Works:

- **Auto White Balance (AWB):** Most cameras default to AWB, which guesses what white is. It’s convenient but not always accurate—especially in mixed lighting.
- **Manual White Balance:** For best results, use a white or grey card to manually set the balance. This tells the camera exactly what “true white” is in your scene, leading to more accurate color reproduction.

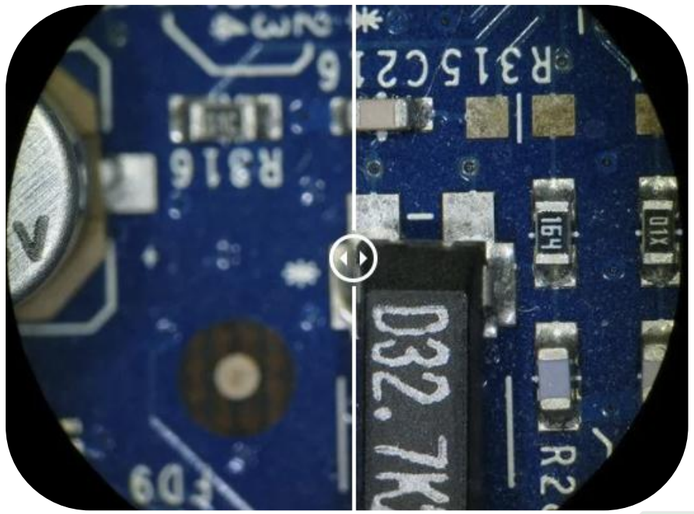
Parfocality Adjustment for All Microscopes

1. Set eyepiece diopter adjustment (lines on the side of eyepiece) to zero or where the two lines meet between the + and – signs. If only one eyepiece adjusts, just set that one. Some microscope may have adjustable eye tubes instead of adjustable eyepieces. In that case you will need to adjust the tube where the eyepieces go, not the eyepiece.

2. Go to the highest magnification on the microscope and focus on a sample. Preferably a thin, flat sample.

3. Now go to the lowest magnification on the microscope.

4. Close your left eye and adjust the right eyepiece (focus) until the image is sharp. Now repeat this process with the left eye. If the microscope only has one adjustment, you only need to adjust one side.



5. Check parfocality by going back to the highest magnification and focusing on a sample. Do not re-adjust eyepieces or tubes. Now go to the lowest magnification. The sample should stay in focus.

JH TECHNOLOGIES™

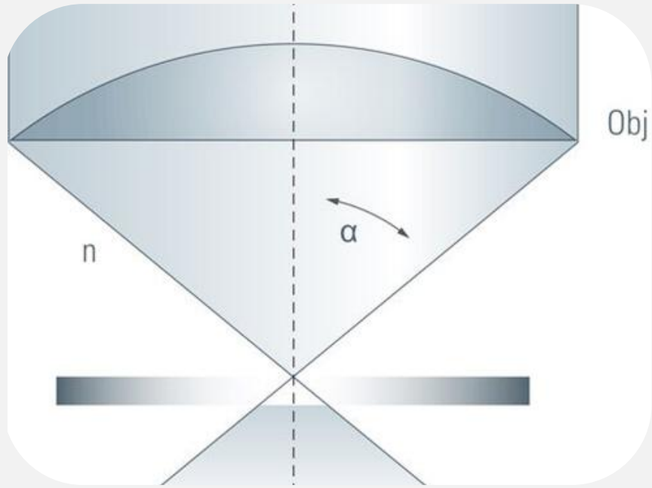
Beware of "Empty" Magnification

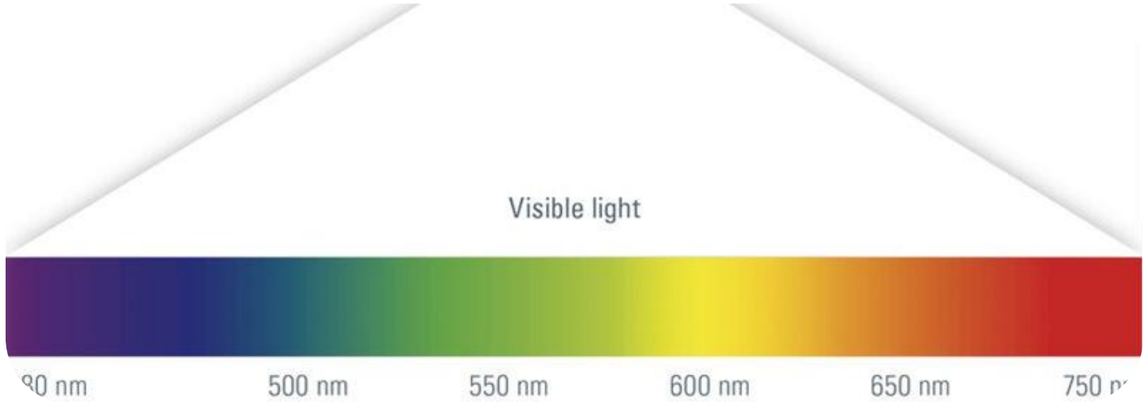
The numerical aperture of the objective determines the detail resolution and brightness of the image.

Light Wavelength Sets the Resolution Limit

Microscope performance depends on resolution, not just magnification. Resolution is the ability to distinguish two closely spaced points. According to the Rayleigh criterion, the minimum resolvable distance is about half the wavelength of light:

- Blue light: d ≈ 0.2 µm
- Red light: d ≈ 0.35 µm
- UV objectives: just under 0.2 µm
- Human eye limit: ~0.2 mm





Resolution also depends on Numerical Aperture (NA), defined as:

NA = n × sin α
- n = refractive index (e.g., nair = 1, noil ≈ 1.5)
- α = half the angular aperture of the objective

In air, NA ≈ 1. With immersion oil, NA can reach ~1.45, improving resolution.

Beware of "Empty" Magnification

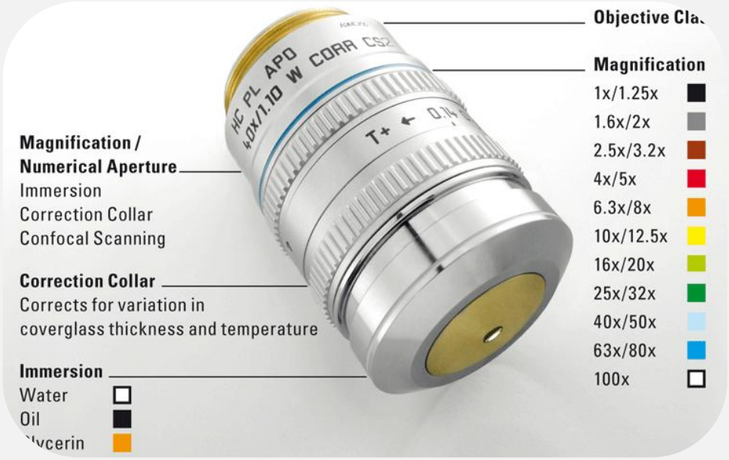
More Magnification is not Always Better

Magnification and Resolution in Optical Microscopy
A basic optical microscope uses two lenses:

- Objective (near specimen)
- Eyepiece (near eye)

Total magnification = objective × eyepiece

Example: 40× objective × 10× eyepiece = 400× magnification



Resolution must be high enough to make magnification meaningful—**they are interdependent**.

- **Low magnification** = low numerical aperture (NA) = low resolution
- **High magnification** = high NA
  - Example: 40× dry objective typically has **NA ≈ 0.8**

However, NA has limits. So does **useful magnification**, which falls between:
500 × NA to **1,000 × NA**

- Practical magnification limit: **~1,400×**
- Anything beyond = **"empty magnification"** (larger image, no added detail)

Example:
Hard metal (10% cobalt, 0.6 µm grain size):

(Courtesy of Konrad Friedrichs GmbH & Co KG, Kulmbach, Germany).

- Left View - Dry objective, NA = 0.90
- Right View - Oil immersion objective, NA = 1.30(Oil improves resolution due to higher NA)

JH TECHNOLOGIES™

Is Magnification of 20,000x Really Useful with Digital Microscopy

Digital vs. Optical Microscopes

- Digital microscopes use a camera only—no eyepieces.
- Stereo and optical microscopes can be fitted with digital cameras for hybrid use.
- Both types serve diverse technical and industrial applications.

Digital systems may claim very high magnification (e.g., 20,000×), but true performance depends on resolution and optical quality, not just magnification numbers.

Magnification Defined

Magnification =
Image feature size / Actual feature size

This gives **lateral (2D) magnification**.

The Best of Both Worlds

Microscopes with both camera and eyepieces offer digital convenience and allow visual color accuracy checks through the eyepieces.

Mil to Micron Conversion Table

Mil [mil, Thou]	Micron [µ]
0.01 mil, thou	0.254 µ
0.1 mil, thou	2.54 µ
1 mil, thou	25.4 µ
2 mil, thou	50.8 µ
3 mil, thou	76.2 µ
5 mil, thou	127 µ
10 mil, thou	254 µ
20 mil, thou	508 µ
50 mil, thou	1,270 µ
100 mil, thou	2,540 µ
1,000 mil, thou	25,400 µ

How to Convert Mil to Micron

1 mi, thou = 25.4 µ
1 µ = 0.0393700787 mil, thou

Example: convert 15 mil, thou to µ:
15 mil, thou = 15 x 25.4 µ = 381 µ

Visit www.unitconverters.net/length/mil-to-micron.htm to learn more.