

The Core Value of Shutter Type 3D Stereo Microscopes



The Core Value of Shutter-Type 3D Stereo Microscopes in the Semiconductor Field

Integrating a shutter-type 3D camera with a high-end stereo microscope significantly enhances system performance in semiconductor inspection, micro/nano manufacturing, and materials science. This combination leverages the wide field of view and high depth of field of stereo microscopes, along with the high-speed, high-precision 3D imaging capabilities of shutter-type 3D cameras. The key benefits include:

Upgraded 3D Imaging Capability

The camera captures real-time 3D point cloud data of sample surfaces with exceptional precision. For challenging materials such as highly reflective surfaces (e.g., metal coatings) or transparent media (e.g., photoresist), the system employs multi-angle illumination and polarization modulation to overcome traditional stereo microscopes' limitations, including overexposure and signal loss.

Synergistic Optimization of Precision and Resolution

By combining the wide field of view (FOV) of stereo microscopes with the high-resolution imaging of advanced cameras, the system achieves seamless integration of macro-scale observation and micro-scale metrology.

Adaptability to Complex Inspection Scenarios

Vibration Resistance for Industrial Environments: Active exposure synchronization technology dynamically compensates for environmental vibrations, ensuring stable imaging even in non-ideal conditions (e.g., factory floors or production lines).

Multi-material compatibility: Supports configurable multi-spectral lighting (e.g., UV-IR) or polarization modules to accommodate diverse semiconductor materials including metals, dielectrics, and polymers.

Optical Configuration Recommendations

Select long working distance objectives (e.g., 1X-2X) to balance resolution and depth of field.

Incorporate a coaxial illumination module to minimize shadow interference in 3D reconstruction.

The integration of cameras with stereo microscopes delivers unique "macro-view + micro-precision" capabilities, making it particularly suited for rapid, multi-scale, and high-precision observation demands in semiconductor manufacturing.



Core Value of Shutter-Type 3D Stereo Microscopes in Biological Observation and Quarantine Inspection

Shutter-type 3D stereo microscopes demonstrate distinct advantages in plant/animal observation and quarantine inspection. By combining the wide field of view and high depth of field of conventional stereo microscopes with the high-precision stereoscopic capabilities of 3D imaging technology, they deliver innovative solutions for biological morphology observation, pathological examination, and rapid quarantine procedures.

High-Precision 3D Morphological Observation

Botanical Research: Enables rapid observation of plant leaf stomatal density, trichome distribution, and root systems (e.g., nodule morphology) with micron-level precision.

Non-Destructive Fruit/Seed Inspection: Conducts 3D analysis of seed surface depressions, texture, and fruit volume/symmetry, replacing traditional destructive sampling methods.

Animal Morphology: Facilitates rapid 3D observation of insect wings, mouthparts, and arthropod structures for species classification or biomimetic design applications.

Efficient Quarantine Screening

Pathogen Diagnosis: Enables stereoscopic imaging of pathogens, clearly revealing 3D structures of fungal spores and nematodes (e.g., sporophore branching angles) to enhance inspection accuracy.

Borer Damage & Lesion Quantification: Provides 3D observation of wood borer tunnel depth or grain mold region volume for objective hazard assessment.

Invasive Species Control: Supports rapid identification and documentation of non-native species for biosecurity prevention.

Live Dynamic Monitoring

Rare Specimen Preservation: Performs 3D digital archiving of museum specimens (e.g., butterfly wings) without physical contact damage.

Stress-free Live Animal Examination: Conducts anesthesia-free detection of surface lesions in live specimens (e.g., bees, fish) to minimize research interference.

Advantages of Non-Destructive Testing

Real-time plant growth monitoring

Parasite behavior tracking: Enables 3D observation of living parasites (e.g., schistosome cercariae in Oncomelania snails) swimming trajectories for transmission pattern analysis.

Four Major Advantages of Shutter-Type 3D Stereo Microscopy Technology

Higher Resolution

Doubles the clarity compared to chromatic aberration 3D and polarized 3D. Naked-eye 3D technology may sacrifice some resolution, which decreases as the viewing angle increases.

Stable, Flicker-Free Imaging

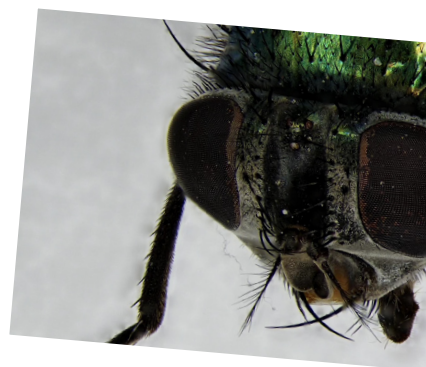
Polarized 3D and naked-eye 3D (directional backlight 3D) require the viewing distance to be within a specific range. Too close or too far may cause flickering or even loss of the image.

Wide Observer Viewing Angle

The display effect of polarized 3D and naked-eye 3D is sensitive to viewing position. Users must stay within a specific angle range for optimal 3D effects; deviation may result in blurring or ghosting.

Full Depth-of-Field Clarity in 3D

Proprietary technology that surpasses the depth-of-field limits of optical microscopes, delivering sharp, full-depth clarity across the entire field of view.



Core Value of Shutter-Type 3D Stereo Microscopes in Preimplantation Embryo Screening

Shutter-Type 3D Stereo Microscope Technology

Utilizes shutter-type phase difference technology to achieve stereoscopic imaging through high-speed screen refresh.
Rapid alternating display of left/right eye images, synchronized with 3D glasses, allows each eye to receive distinct images—forming a 3D contour perception in the brain.
Features a 4K dual-camera architecture for higher resolution and precise color reproduction, delivering an unparalleled visual experience.

Intelligent Image Processing, Your Efficient Research Assistant

One-click switching between 2D/3D display
Supports WiFi connection to smartphones for 3D image viewing (AR glasses optional)
3D image saving function to enhance identification efficiency



Stereomorphological Evaluation

360° observation of embryonic 3D structures;
Precise assessment of cell mass morphology, symmetry, and fragment distribution;
Detection of subtle abnormalities undetectable by conventional methods.

Dynamic Developmental Monitoring

Tracks cell division processes in real time;
Records temporal developmental characteristics of embryos;
Captures critical developmental milestones (e.g., pronuclei formation, cleavage synchrony).

Advantages of Non-invasive Detection

Contact-free observation prevents embryo stress;
Reduces phototoxicity risk from repeated focusing;
Complies with stringent ART operational standards.

Typical Application Scenarios

Pronuclear stage evaluation with synchronous polar body positioning analysis;
Blastocyst-stage spatial mapping of inner cell mass;
Post-thaw detection of zona pellucida microcracks.



Core Value of Shutter-Type 3D Stereo Microscopes in Antique Artifact Authentication

Conventional authentication methods cannot achieve high-precision 3D visualization analysis. Shutter-type 3D stereo microscopes play an incomparable role in authenticity determination, craftsmanship study, and restoration guidance.

High-Resolution 3D Imaging of Microstructures

Surface Topography Reconstruction: The 3D microscope enables micron-level stereoscopic imaging of artifact surfaces, clearly revealing microscopic features such as carving marks, glaze bubbles, and metal crystalline structures. For example, analyzing the distribution patterns of bubbles in porcelain glaze can assist in dating artifacts or identifying replicas.

Hidden Defect Detection: Capable of identifying imperceptible restoration traces (e.g., retouching, joint repairs), artificial aging techniques (acid etching, artificial wear), or modern tool marks (e.g., electric engraver patterns) invisible to the naked eye.

Precision Analysis of Materials and Techniques

Technique Characterization: Enables comparative analysis through 3D reconstruction of ancient craftsmanship signatures (e.g., investment casting residues in bronze lost-wax artifacts, fiber interweaving patterns in calligraphy paper), cross-referenced with authenticated specimen databases to verify period-appropriate production methods.

Stratigraphic Material Analysis: Enables non-destructive cross-sectional examination of layered structures (e.g., lacquerware base layers vs. surface coatings, oil paint layering sequences) to verify compliance with historical production logic.

Non-Contact Detection Ensures Artifact Safety

Eliminates the need for physical sampling or contact (e.g., traditional cross-section testing), preventing secondary damage to fragile artifacts (e.g., silk textiles, mural paintings). Particularly critical for national treasures where sampling is prohibited.



Case Applications

Porcelain Authentication: Identifies 3D differences between laser-engraved marks on modern replicas and hand-carved signatures on genuine pieces.

Bronze Artifact Verification: Analyzes corrosion product distribution to detect artificially applied "paste patina" forgeries.

Calligraphy/Painting Authentication: Distinguishes modern high-quality printed replicas by examining ink penetration depth and 3D paper fiber structures.



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Specifications and Packing list

Applicable brands	Leica	Nikon	Olympus(Evident)	Nexcope
Applicable models	M125C, M205C, M204 FA ,M205FCA, M50,M60,M80,M165FC	SMZ25, SMZ18, SMZ1270, SMZ1270i, SMZ800N	SZX7; SZX10, SZX16	NSZ818
Models	DB20			
category	3D-LT-08	3D-NT-08	3D-AT-08	3D-NEX-08
	Camera Left, Camera Right			
Physical resolution	8.3MP			
Image sensor	SONY IMX678 CMOS			
Exposure mode	Rolling Shutter			
Maximum resolution	3840×2160 (8,294,400 Pixels)			
ISO sensitivity	Equivalent to 100-12800			
Sensor size	1/1.8"			
Pixel size	2μm×2μm			
Spectral response	400-650nm			
Exposure capability	Real-time auto and manual adjustment			
Exposure time	10μs-10s			
White balance	Real-time auto and manual RB adjustment			
Preview resolution	3840×2160@60fps			
Power supply	DC 12V 5A			
A/D conversion bit depth	12bit			
Software and App	Windows software: KoPa 3D ; APP: KoPa WiFi Lab			



Phase-Difference Shutter Type 3D Camera

3D Computer Host (Final specifications subject to shipment)

Operating System: Microsoft Windows 11
CPU: Intel Core i7 14th Gen
Storage: 512GB SSD or more
RAM: 16GB or more
Graphics Card: Dedicated (NVIDIA Quadro M4000 8GB)
Ethernet: 10/100/1000M Adaptive
Wireless: support 5G WiFi (IEEE 802.11ac)



3D Monitor

Screen Size: 27-inch
Resolution: 2560×1440 (QHD)
Refresh Rate: 120Hz
Panel Type: IPS
Viewing Angle: 178°(H)/178°(V)
Pixel Pitch: 0.233mm
Video Ports: DisplayPort

3D Glasses (Standard 3pcs)

Sync Method: RF
Sync Frequency: 120Hz
Transmittance: 42%±2
Battery Life: 35±5h (Fully Charged)
Weight: 26g



KoPa® GuangZhou Ostec Electronic Technology Co.,Limited

Manufacturer: No.8 West Lane, Jiangcheng Road, Bangjiang East Village,Dalong street, Panyu District, Guangzhou, China.



High-Tech Enterprise certificate number: GR202344009665



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