

Comfort and Precision in Industrial Applications



# Comfort for Your Eyes—Precision for Your Work

Using a microscope for a long period of time can cause eyes to become fatigued. Olympus redesigned the SZ series of stereo zoom microscopes to reduce eyestrain and maximize user comfort.

Less fatigue and eyestrain leads to more precise and consistent results in an operator's daily work.

All three models—the SZX7 with its advanced Galilean optical system, the full-featured SZ61, and the versatile SZ51—are designed for user comfort and provide crisp 3D images with true color and high resolution.



**SZ51**



**SZ61**

CONTENTS	
Features .....	1-12
• SZX7 Optical Performance	• SZ61/SZ51 Optical Performance
• Ergonomic Design	• Illumination System
• Digital Imaging and Recording System	• Mounting System and Accessories
Specifications .....	13-14
SZX7 system diagram .....	15-16
SZ61/SZ51 system diagram .....	17-18
Dimensions .....	Back Cover



**SZX7**



**SZ61TR**

**SZX7:** The ergonomic design combined with high image quality helps users to work for long periods of time without becoming fatigued.

**SZ61:** Excellent optical performance with a zoom ratio of 6.7:1.

Model variations: SZ61TR (with trinocular tube) and SZ61-60 (with a 60-degree observation tube inclination).

**SZ51:** Versatile, cost-efficient, and ideal in all line inspection applications.

# Improved Ergonomic Instrumentation Means Improved Work Performance

Ergonomic improvements to our stereo microscopes enable natural posture for each user, improving comfort even when working for long periods of time.

## Work in Comfort with Our New Ergonomic Components

With the SZX7 microscope's ergonomic instrumentation, eyepiece height and angle can be easily adjusted to suit individual users. This reduces user fatigue, which leads to increased productivity and inspection quality.

## 7:1 Wide Zoom Ratio

With a magnification range of 8X–56X (using a 1X objective with a 10X eyepiece), the SZX7 microscope offers a maximum zoom ratio of 7:1. This zoom ratio enables most specimens to be observed at the appropriate magnifications.

## Excellent Resolving Power

Superior quality objectives deliver accurate, high-resolution images that show specimens in minute detail.

## Objectives that Suit Your Specimens and Applications

- Superior image flatness:

The DFPlan objective series accurately reproduces the original shape of the specimen.

- Long working distance (WD):

The objectives range from the SZX-ACH1X (90 mm WD) to the DFPL0.5X (198 mm WD). As a result, even specimen surfaces that are difficult to access can be easily observed.

- Ideal for high magnification:

The microscope delivers excellent image quality up to 336X, by combining a 2X objective with 30X eyepieces. Also available is an excellent apochromatic objective, DFPLAPO1.25X, with a higher zoom range of 1X through 7X.



*Galilean optics feature two (right/left) independent and parallel zoom optical paths to produce the focal point with one objective. The system enables high optical performance as well as functional modularity.*





### ComfortView Eyepieces for Greater Comfort and Faster Work

New ComfortView eyepieces feature pupil aberration control and appropriate positioning in the eye point for fast and comfortable observations.

### Accurate Color Reproduction

The careful selection of lens surface coatings and glass materials for the entire optical system make it possible to observe and document specimens with accurate color reproducibility.

### Sharp, Clear, High-Contrast Images

The low, suppressed field curvature contributes to accurately reproduce the shape of the specimen.

### A Wide Variety of Observation Tubes and Intermediate Tubes Enable Operators to Obtain the Right Image

Various types of tubes are available, and they can be freely combined to create the ideal system for any application.



Aperture diaphragm unit / SZX-AS



1. 45 degree binocular head / SZX-BI45 2. Tilting trinocular head / SZX2-TTR  
3. 30 degree trinocular head / SZX-TR30 4. Ergonomic Long Tilting Trinocular / SZX2-LTTR

# Precise, Functional, and Compact—SZ61/SZ51

The SZ61/SZ51 incorporate the Greenough optical system and accomplish a range of practical observation and documentation functions in a compact design.

## 6.7:1 Wide Zoom Ratio

The SZ61 microscope's wide magnification range extends from 6.7X through 45X (using 10X eyepieces) with a zoom ratio of 6.7:1. The newly developed optical system enables fast, comfortable observations at the most appropriate magnification. The SZ51 has a magnification range of 8X through 40X (using 10X eyepieces) with a zoom ratio of 5:1.

## Outstanding Depth of Focus and Flatness

The 10-degree angle convergence of the image forming path in the Greenough optical system delivers excellent image flatness with a deep depth of focus.

## ComfortView Eyepieces for Greater Comfort and Faster Work

ComfortView eyepieces feature pupil aberration control and appropriate positioning in the eye point for fast and comfortable observations.

## Accurate Color Reproduction

The glass material and surface coating on these objectives provide accurate specimen color reproducibility.

## Sharp, Clear, High-Contrast Images

The low, suppressed field curvature faithfully reproduces the shape of your specimen.



*The Greenough optical system has two zoom optical paths inclined at an inward angle. This enables a more compact microscope design while maintaining high performance.*



#### Five Zoom Body Variations with High Performance

The SZ61 and SZ51 zoom bodies provide two different magnification ranges. They are available with an ergonomically designed 45-degree inclination tube for use on the standard stand. Models with a 60-degree inclination tube (SZ61-60/SZ51-60) are available for special applications where the zoom body has to be tilted for use with other equipment or mounted on a universal stand. For documentation purposes, Olympus also offers the SZ61TR, which incorporates a trinocular tube for easy attachment of digital and video cameras.

#### Wide Choice of Auxiliary Objectives

A wide choice of auxiliary objectives enable observations at magnifications from 2X to 270X and a WD up to 350 mm.





# Work Comfortably and Productively

Olympus is committed to making work easy, comfortable, and productive through leading-edge ergonomic designs. That means applying advanced technological methods to excellent operability, reducing factors that contribute to operator fatigue, and building in effective safety features like an electrostatic discharge (ESD) safe design.

## Ergonomic Instruments Enable Natural Posture, Reduced Stress, and Increased Productivity

The ergonomic long tilting trinocular provides an optimized work position for individual users by bringing the microscope closer to the user, while the extendable eyepoint adjuster provides flexibility for users of different heights. The SZX series' ergonomic instruments reduce stress during observation by providing the most comfortable position for each user, increasing work efficiency.

## Ergonomic Design Based on 3D CAD Analysis

The microscope body and stand feature precisely curved contours developed through careful 3D computer aided design (CAD) analysis. Key ergonomic features help to reduce fatigue in periods of long observation and include an all-round finish that's smooth to the touch.

## Convenient Front-Access Operation

Improved ease of access to the most frequently used knobs and switches maximizes operator comfort and reduces back strain.

## Precise Recall of Specific Magnification Settings via Integrated Click-Stop Mechanism (SZX7) or Zoom Knob Stopper (SZ61/SZ51)

Many inspection tasks require the use of the same zoom magnification setting to ensure consistent and comparable results. The integrated click-stop mechanism provides quick and easy access to this important function. The zoom knob stopper enables the user to accurately choose their desired magnification, and the setting in use is clearly displayed on the front control panel.

## New Eyepiece Reduces Fatigue and Excludes Dust

This eyepiece features a pupillary aberration control mechanism whereby the image remains visible even if the operator's eyes move. This lessens operator fatigue in long-duration observations. The unique eyepiece mounting design excludes dust particles and keeps the eyepiece firmly in place, ensuring clear images and an ergonomic eyepiece position.

## ESD Safety Design

All microscope bodies and accessories are ESD-safe and are able to discharge static electricity from 1000 V down to 100 V in less than 0.2 seconds, protecting the equipment and helping prevent sample damage.



Extendable eyepoint adjuster



LED transmitted / reflected light illumination stand



Zoom handle





Click-stop mechanism (SZX7)



Zoom knob stopper (SZ61/SZ51)



Eyepiece lock



Ground wire connection (back side)

# Olympus Light Solutions Maximize Visibility in Different Tasks

Olympus offers a range of light solutions precisely tuned to the stereo zoom microscope's optical system to maximize the visibility of minute characteristics.

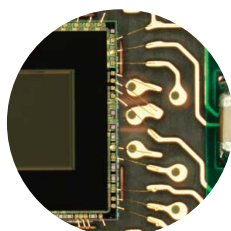
## The New Integrated LED Reflected/Transmitted Illumination Base

The universal reflected/transmitted illumination base brings together all the advantages of LED technology. It enables the simultaneous use of reflected and transmitted illumination and can alter their respective intensities continuously and separately by means of convenient dials on the base. The use of slim, ultra-bright LED's successfully integrates transmitted illumination in a slim 25 mm thick base that facilitates easy specimen access and manipulation. The complete microscope, including LED integrated base, is lightweight, compact, and easy to carry.

## Universal Reflected Illumination Systems

Fiber optic illumination systems offer excellent illumination quality and flexibility. Olympus offers a compact 6 W LED light source (SZ2-CLS) and a 37W LED light source (LG-LSLED) for professional use. Homogeneous illumination can be achieved by a ring light. For special contrast effects on free form 3D shapes, Olympus offers a choice of single and double self-supporting spot illumination fiber guides and precisely adjustable flexible fiber guides.

\*An equivalent model may be offered in some areas.

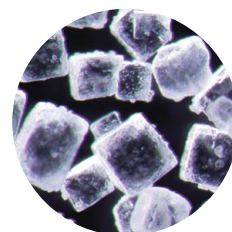


Homogeneous light

## Transmitted Light Illumination Systems

For all transparent materials as well as for background illumination for the inspection of through holes, Olympus illumination base is available to select brightfield, darkfield, oblique and polarized filter cartridge unit (SZX2-ILLTS/SZX2-ILLTQ).

Also available is a brightfield/oblique illumination attachment (SZ2-ILA) that can accommodate various light sources.

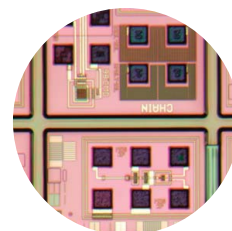


Darkfield light

## Special Illumination Techniques

### • Looking into holes

Olympus offers effective coaxial illuminators for the SZX7 (SZX2-ILLC10) and the SZ61/SZ51 (SZ2-ILLC) microscopes, which direct the light through the microscope's optical axis onto the specimen.



Coaxial light



Flexible angle of LED light source



Homogeneous illumination fiber optic systems



Intelligent LED ring illumination



White LED illumination unit



### Making Stress in Transparent Materials Visible

Also available are simple and advanced transmitted illumination stands with polarizing equipment (SZX2-AN, SZX-POL, and SZ-POL2) for the efficient evaluation of tensions in transparent materials like plastic and glass. Their ease of use enables continuous, reliable production control of processes like injection molding.

*The transmitted/reflected integrated LED illumination stand's slim body and easy operation enables quick observations in a comfortable posture.*



Single illumination fiber optic systems



Transmitted and coaxial illumination with fiber optic systems



High-power fiber optic illumination system



# Digital Imaging



SZX7 microscope in combination with the DP74 digital camera system

## DP74 High-Resolution Digital Camera

The high-resolution, 20.7-megapixel DP74 digital camera facilitates diverse R&D applications. This versatile yet cost-effective camera features a LiveHDR mode, optimizing contrast and brightness in individual regions, and high-quality fluorescence imaging with powerful noise reduction and gain sensitivity functions.



SZX7 in combination with DP27 digital camera system

## DP27 and DP22 Compact Digital Cameras

When bench space is limited, the 5-megapixel DP27 camera and the 2.8-megapixel DP22 camera can be controlled without a PC. A dedicated control box provides smooth and intuitive operation via a touch screen monitor or a mouse. Measurements and adding comments in an image are also available.



# A Range of Accessories to Meet Your Needs

## Easily Mount with Other Equipment (Bonder and Prober Arms)

The SZX7, SZ61, and SZ51 microscopes are designed to be integrated into process equipment. Olympus offers various bonder and prober arms for all common brands.



1. B & L style bonder arm / SZ2-STB1 2. Bonder arm / SZ2-STB2 3. Bonder arm / SZ2-STB3  
4. Prober arm / SZ2-STP 5. Arm for SZX stand /SZ2-ST5 6. Adapter for B & L bonder arm / SZ-BLAD



## Stage Adapters for Efficient Inspections

For your convenience, a range of compatible stage adapters is available, including the cup stage SZH-SC, which gives the specimen a slant angle up to 30 degrees from level.



SZH-SC

## Various Universal Stands

A variety of universal stands are available for the observation of large specimens. No matter how big the samples are or how much they vary in size, Olympus has the right choice of stands to suit any requirements.



SZX7+SZ2-STU2



SZ61+SZ2-STU3

## SZX7 specifications

Item		Specifications				
Zoom microscope body SZX-ZB7		Zoom drive: Horizontal knob system Click stop for each zoom magnification: ON-OFF switching possible Zoom ratio values: 7:1 (0.8X to 5.6X) Zoom magnification indication: 0.8, 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 5.6 Objective mounting: Screw mounting into thread Lead-free materials used				
		Aperture iris diaphragm control: The AS unit (SZX-AS) is mountable				
Observation tube SZX-BI45 SZX2-TTR SZX2-TR30 SZX2-LTTR		SZX-BI45	SZX2-TTR	SZX2-TR30	SZX2-LTTR <sup>*1</sup>	
		Binocular tube View inclination angle 45° Lead-free materials used	Tilting binocular (trinocular) tube View tilting angle 5° to 45°	Trinocular tube View inclination angle 30° Light path selection: 2 steps (Binocular 100%, Video 50%/Binocular 50%)	Ergonomic Long Tilting Trinocular View tilting angle 5° to 45°, Light path selection: 2 steps (Binocular 100%, Video 50%/Binocular 50%)	
		Interpupillary distance adjustable range			52 to 76 mm Eyepiece clamping knob provided	57 to 80 mm Eyepiece clamping knob provided
		Extendable Eyepoint adjuster				
Stand SZ2-ST SZ2-ILST		SZ2-ST	SZ2-ILST			
		Standard stand	LED reflected/transmitted illumination stand			
Frame installation		Mounting diameter 76 mm				
Focusing adjustment		Knob rotation tension adjustment Focusing stroke 120 mm				
Stage plate		SZ2-SPBW (Black & white) SP-C (Glass clear transparent)	100 mm diameter dedicated glass plate is included			
Light source		Compact light guide illuminator (SZ2-CLS) mountable (option) Transmitted light illumination attachment (SZ2-ILA) mountable (option)	Transmitted illumination: LED Reflected illumination: LED Average LED life span: 6000 hrs. Input rating: 100–120 V/200–240 V~0.15/0.1 A, 50/60 Hz			
Objectives		Model		Working distance		
		DFPL0.5X-4 <sup>*2</sup> DFPL0.75X-4 DFPLAPO1X-4 SZX-ACH1X DFPLAPO1.25X SZX-ACH1.25X-2 DFPL1.5X-4 DFPL2X-4 All objectives: Lead-free materials		171 mm 116 mm 81 mm 90 mm 60 mm 68 mm 45.5 mm 33.5 mm		
Eyepieces		Comfort/View WHSZ series All eyepieces: Lead-free materials				
Weight	Configuration 1	4360 g (9.6 lb)	5400 g (11.9 lb)	5200 g (11.5 lb)	5300 g (11.7 lb)	
	Configuration 2	5160 g (11.4 lb)	6200 g (13.6 lb)	6000 g (13.2 lb)	6100 g (13.4 lb)	

<sup>\*1</sup> SZX2-LTTR: intermediate magnification is 1.25X.

<sup>\*2</sup> The SZ2-ET auxiliary sleeve is required when the SZ2-ST/ SZ2-ILST is used.

Configuration 1: SZX-ZB7 + DFPLAPO1X-4 + individual observation tube + WHSZ10X-H (2) + SZ2-ST  
Configuration 2: SZX-ZB7 + DFPLAPO1X-4 + individual observation tube + WHSZ10X-H (2) + SZ2-ILST

## SZ61/SZ51 specifications

Item		Specifications				
Microscope body SZ61 SZ61-60 SZ61TR SZ51 SZ51-60		SZ61	SZ61-60	SZ61TR	SZ51	SZ51-60
	Magnification	0.67X to 4.5X			0.8X to 4X	
	Zoom ratio	6.7:1			5:1	
	Working distance	110 mm				
	Tube inclination angle	45°	60°	45°		60°
	Interpupillary distance adjustment	Left/right interlocked Adjustment range: 52 to 76 mm (using the WHSZ10X eyepieces)				
	Video camera adaptability	—		C-mount (0.5X built in)	—	
	Zoom adjustment knob	Left/right single-shaft horizontal knob Interpupillary distance high/low magnification stopper incorporated.				
	Optical components	Lead-free materials used				
Auxiliary objective		Mounting by screwing into the thread at the bottom of frame (M48 thread X0.75)				
Eyepiece		ComfortView WHSZ series Lead-free materials used				
Stand SZ2-ST SZ2-ILST		SZ2-ST			SZ2-ILST	
		Standard stand			LED reflected/transmitted illumination stand	
	Frame installation	Mounting diameter: 76 mm				
	Focusing adjustment	Focusing stroke: 120 mm				
	Stage plate	SZ2-SPBW (Black & white for anti-ESD) SP-C (Clear glass plate)			The dedicated glass plate in 100 mm dia. included	
	Light source	Compact light guide illuminator (SZ2-CLS) mountable (option) Transmitted light illumination attachment (SZ2-ILA) mountable (option)			Transmitted illumination: LED Reflected illumination: LED Average LED life span: 6000 hrs. Input rating: 100–120 V/200–240 V ~0.15/0.1 A, 50/60 Hz	
Weight	Zoom body only	1300 g (2.9 lb)		1500 g (3.3 lb)	1300 g (2.9 lb)	
	Configuration 3	3520 g (7.7 lb)		3720 g (8.1 lb)	3520 g (7.7 lb)	

Configuration3: Zoom body + WHSZ10X-H(2) + SZ2-ST