

GEMOLOGY Series



Specifically Designed for Specialists

Gemological stereomicroscopes are meant to help with stone inspection and stone setting. Jewels and gems have a variety of grades (or quality levels), which ultimately influence their value and cost on the market; therefore it is important to have solutions that are purposely designed for gemology. These stereomicroscopes are equipped with iris and darkfield condenser on the bottom light source, and with a set of on stage tweezers to hold the stone in place.

Much More Than Gemological Stereomicroscopes

OPTIGEM-1 & OPTIGEM-2 are two-in-one gemology instruments that can be used both in vertical and horizontal position in a very easy way, just by turning one knob (no disassembling and re-assembling operations are required). The horizontal position extends the use of a gemological microscope, giving the possibility to perform immersion analysis by submerging a sample in liquid. If the stone's refractive index is close to the liquid's one, immersion makes the interior more visible by reducing the effects of refraction and surface reflection. This enables you to see a gem's inclusions or color distribution more easily. Immersion is also necessary to see crystal growth structures, which might help you separate natural from synthetic corundum. Features like curved growth striae in flame-fusion synthetics, or separation planes in assembled stones, are often far easier to see when the stone is immersed.



Vertical position for standard gem analysis with darkfield illumination and polarizing technique



Horizontal position for immersion gem analysis

Incredibly Versatile Operations

OPTIGEM Series offers multiple options for illumination and contrast techniques, such as incident, transmitted and oblique brightfield darkfield, polarization and immersion analysis only on Optigem 1 & 2. They come with a special (see the dedicated chapter for further information) optical condenser configuration to ensure real, perfect darkfield application.

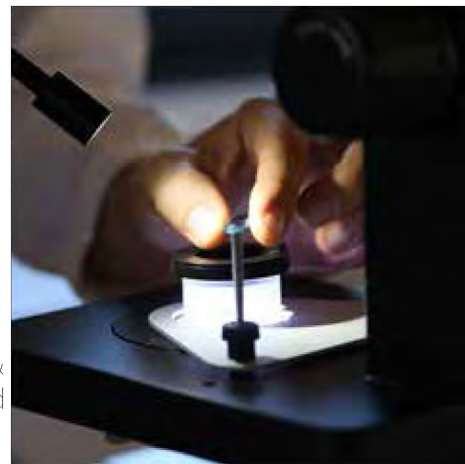
Stereozoom Microscopes For Gemology

Ultrabright LED Condenser for Optimized Illumination

An ultrabright LED-based electronic condenser with intensity control allows to switch from brightfield to darkfield; it also produces perfectly the colour of daylight. The condenser uses a new optical configuration especially created in order to obtain a perfect darkfield application.

Dedicated LED Illumination For Outstanding Results During Grading

The requirement for a pure white (6.3000 K), particularly high intensity light is because only incident light is seen: a flexible arm can be freely positioned and the brightness of the LED illumination accurately adjusted. LED transmitted illumination is available through a diffusing disc (for brightfield) or as a side-emitting LED ring (darkfield, with black background) on Optigem 1 & 2. A selector gives the chance to set the microscope in 3 configurations: brightfield only, darkfield only, or both brightfield and darkfield.



Get the most out of our accessories

A wide range of optional accessories completes these instruments: from gemology clip, iris aperture diaphragm, polarization analysis kit, optical unit to switch the darkfield from a "sharp" (gem exhibition) to a "soft" (diamond analysis) mode, translating cell holder with vacuum pick-up and quartz immersion cells complete and enhance the OPTIGEM-1 & OPTIGEM-2 performances. All the accessories can be stacked, in any order, while using the microscope both horizontally and vertically.



ST-202

ST-202 - Polarizing analysis kit

Polarization technique allows to quickly determine if the stone at hand is isotropic or anisotropic or, at best, to determine the optic character of gemstones (twin planes, strain, pleochroism, etc.). It is also the preferred tool for separating synthetic Quartz from its natural counterparts. In addition, the polarizing microscope may be very useful for distinguishing solid inclusions from negative inclusions as well as for spotting polysynthetic twinning.

GEMOLOGY Series

Applications

Some application examples demonstrating the performance of OPTIGEM Series, especially designed to observe samples of precious stones and jewels and provided with specific features for gemological needs.

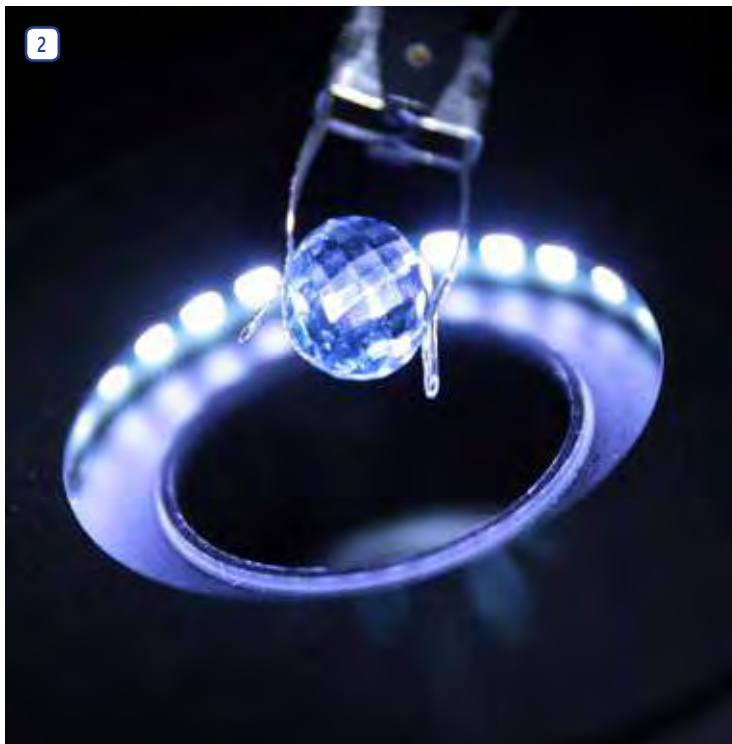
Legend

1. Inspection of stones with SZM-GEM-1.
2. Inspection of stones with pure white darkfield illumination.
3. Immersion cell (ST-203) on a translating support (ST-204).
4. Sample of Citrine.
5. ST-201 accessory creates a soft darkfield illumination ideal for diamond analysis.
6. Optigem can be easily rotated to a horizontal working position.
7. ST-201 accessory for analysis under polarized light.
8. Working with Optigem and its accessories (they can be stacked for increased functionality)

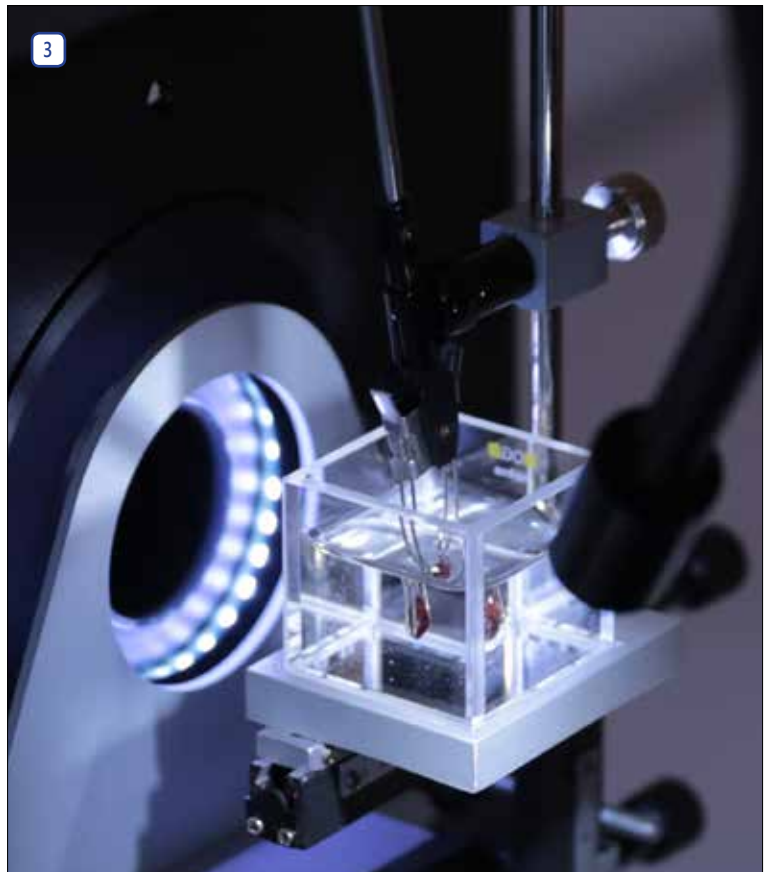
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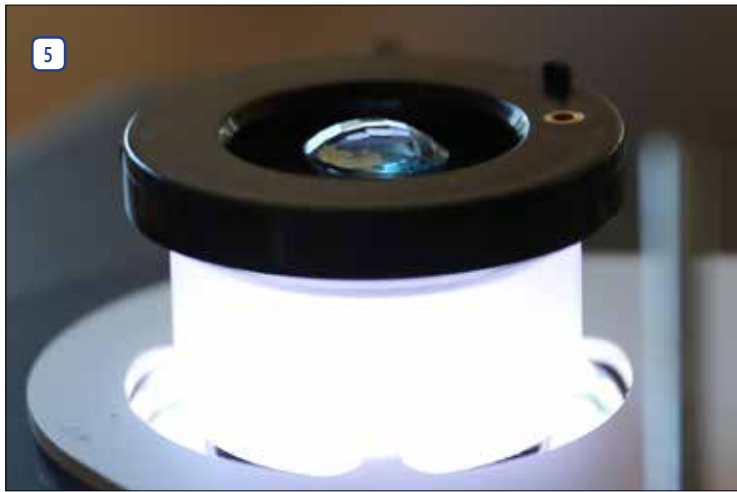
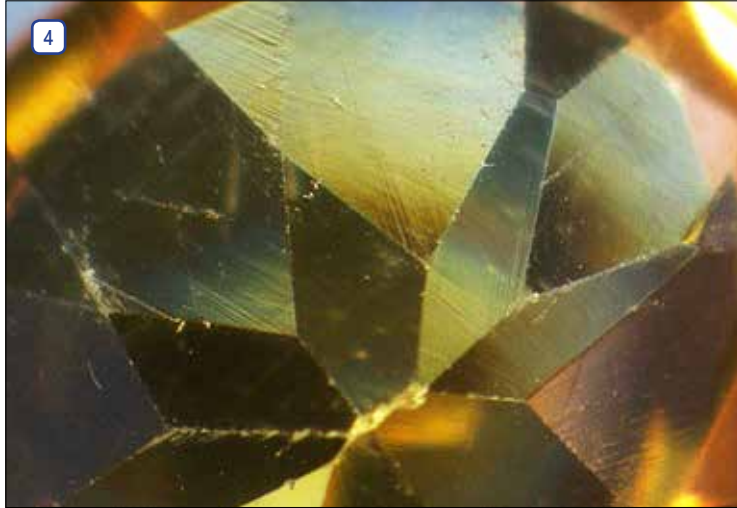


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GEMOLOGY Series - Range

As a leading company in the supply of gemological microscopes, OPTIKA offers 3 series of microscopes purposely designed for this sector by using both brightfield and darkfield methods, SZM-GEM-1 / SZM-GEM-2, OPTIGEM-1 / OPTIGEM-2 and OPTIGEM-3 / OPTIGEM-4. Every microscope has been designed and manufactured in order to satisfy the requests of a very demanding industry; brightfield/darkfield, immersion analysis, light color temperature: no detail has been left to chance.



Observation mode:

Brightfield, darkfield, polarization.

Heads:

Binocular or trinocular, 360° rotating and 45° inclined.

Interpupillary distance:

SZM-GEM-1/2 & OPTIGEM-1/2: Adjustable between 51 and 75 mm.

OPTIGEM-3/4: Adjustable between 55 and 75 mm.

Dioptric adjustment:

On both eyepiece tubes.

Eyepieces:

SZM-GEM-1/2 & OPTIGEM-1/2: EWF10x/20mm

OPTIGEM-3/4: EWF10x/22mm

Objectives:

SZM-GEM-1/2: Zoom range: 0.7x - 4.5x. Working distance: 100 mm.

Zoom factor: 6.42:1

OPTIGEM-1/2: Zoom range: 0.7x - 4.5x. Working distance: 100 mm.

Zoom factor: 6.42:1

OPTIGEM-3/4: Zoom range: 0.67x - 4.5x. Working distance: 110 mm.

Zoom factor: 6.71:1

Specimen stage:

Adjustable gemology clip.

Stands:

OPTIGEM-1/2:

Rack-and-pinion stand (it can be inclined 90° for horizontal use). Base: 270x210x60h mm. Weight: 6 Kg.

OPTIGEM-3/4:

Rack-and-pinion stand (it can be inclined 45°). 360° rotating base.

Base: 305x260x70h mm. Weight: 7 Kg.

SZM-GEM-1/2:

Pillar stand height 25 cm. Base: 260x200x60h mm. Weight: 6 Kg.

Focusing:

By means of a rack and pinion controlled by a pair of knobs placed on both sides of the stereomicroscope.

Illumination:

OPTIGEM-1/2:

Incident illumination: LED flexible arm with brightness adjustment.

Transmitted illumination: side-emitting LED system for brightfield and darkfield. Three possible modes of illumination: brightfield, darkfield, or both. LED temperature color: 6300K (pure white).

OPTIGEM-3/4:

Incident illumination: flexible arm, fluorescent tube 7W 6400K (pure white). Transmitted illumination: system for observation with brightfield and darkfield, based on 30W halogen illumination and reflecting system.

SZM-GEM-1/2:

Incident illumination: dichroic halogen lamp 12V/15W.

Transmitted illumination: Diffusive LED disc for observation in brightfield and side-emitting LED ring for observation in darkfield.

GEMOLOGY Series - Range

OPTIGEM-1



Binocular stereomicroscope for brightfield and darkfield applications with **special side-emitting LED illumination ring** for true darkfield illumination. Equipped also with an incident LED flexible arm and a diffusive LED disc for transmitted illumination. The instrument can be **easily tilted horizontally** for immersion analysis. The body is 360° rotatable to show gems to customers, or share opinions with a colleague.

OPTIGEM-2



Trinocular stereomicroscope for brightfield and darkfield applications with **special side-emitting LED illumination ring** for true darkfield illumination. Equipped also with an incident LED flexible arm and a diffusive LED disc for transmitted illumination. The instrument can be **easily tilted horizontally** for immersion analysis. The body is 360° rotatable to show gems to customers, or share opinions with a colleague.

OPTIGEM-3



Binocular stereomicroscope for brightfield and darkfield applications. The **darkfield condenser** uses a typical optical configuration, based on halogen illumination and a classic reflecting system. A **flexible arm** with a fluorescent tube simulates the color of daylight for **accurate color grading**. The stand can be inclined backward by 45° for to increase comfort and ergonomoy.

OPTIGEM-4



Trinocular stereomicroscope for brightfield and darkfield applications. The **darkfield condenser** uses a typical optical configuration, based on halogen illumination and a classic reflecting system. A **flexible arm** with a fluorescent tube simulates the color of daylight for **accurate color grading**. The stand can be inclined backward by 45° for to increase comfort and ergonomoy.

GEMOLOGY Series - Range

SZM-GEM-1



Binocular stereomicroscope with pillar stand and illuminated stage for brightfield and darkfield applications with special **LED illumination ring** for true darkfield illumination.

SZM-GEM-2



Trinocular stereomicroscope with pillar stand and illuminated stage for brightfield and darkfield applications with special **LED illumination ring** for true darkfield illumination.

GEMOLOGY Series - Comparison chart

Model	Head	Eyepieces	Objectives	Stand	Illumination
OPTIGEM-1	Binocular, 360° rotating, 45° inclined	Wide Field 10x/20mm	0.7 4.5x Zoom	Gemological stand	Incident illumination: LED flexible arm with brightness adjustment. Transmitted illumination: Diffusive LED disc for observation in brightfield and side-emitting LED ring for observation in darkfield.
OPTIGEM-2	Trinocular, 360° rotating, 45° inclined	Wide Field 10x/20mm	0.7 4.5x Zoom	Gemological stand	Incident illumination: LED flexible arm with brightness adjustment. Transmitted illumination: Diffusive LED disc for observation in brightfield and side-emitting LED ring for observation in darkfield.
OPTIGEM-3	Binocular, 360° rotating, 45° inclined	Wide Field 10x/22mm	0.67 4.5x Zoom	Gemological stand	Incident illumination: flexible arm with fluorescent tube 7W (pure white). Transmitted illumination: 30W halogen bulb and a dedicated reflecting system for observation with brightfield and darkfield.
OPTIGEM-4	Trinocular, 360° rotating, 45° inclined	Wide Field 10x/22mm	0.67 4.5x Zoom	Gemological stand	Incident illumination: flexible arm with fluorescent tube 7W (pure white). Transmitted illumination: 30W halogen bulb and a dedicated reflecting system for observation with brightfield and darkfield.
SZM-GEM-1	Binocular, 360° rotating, 45° inclined	Wide Field 10x/20mm	0.7x....4.5x zoom	Pillar stand	Incident illumination: dichroic halogen lamp 12V/15W. Transmitted illumination: Diffusive LED disc for observation in brightfield and side-emitting LED ring for observation in darkfield.
SZM-GEM-2	Trinocular, 360° rotating, 45° inclined	Wide Field 10x/20mm	0.7x....4.5x zoom	Pillar stand	Incident illumination: dichroic halogen lamp 12V/15W. Transmitted illumination: Diffusive LED disc for observation in brightfield and side-emitting LED ring for observation in darkfield.

GEMOLOGY Series - Optical performance

OPTIGEM-1/2 - Optical performance

Eyeiece	10x (ST-081)		15x (ST-082)		20x (ST-083)	
Field number (mm)	20		15		10	
Objective	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)
0.5x	3.5x-22.5x	57.14-8.88	5.25x-33.75x	28.57-4.44	7x-45x	14.28-2.22
0.75x	5.25x-33.75x	38.10-5.92	7.87x-50.62	19.06-2.96	10.50x-67.5x	9.52-1.48
1x	7x-45x	28.57-4.44	10.5x-67.5x	0.95-2.22	14x-90x	7.14-1.11
1.5x	10.50x-67.5x	19.05-2.96	15.75x-101.25x	9.52-1.48	21x-135x	4.76-0.74
2x	14x-90x	14.28-2.22	21x-135x	7.14-1.11	28x-180x	3.57-0.55

OPTIGEM-3/4 - Optical performance

Eyeiece	10x (ST-141)		15x (ST-142)		20x (ST-143)		25x (ST-144)	
Field number (mm)	22		16		12		9	
Objective	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)
0.3x	2.01x – 13.5x	109.45-16.30	3.02x – 20.25x	52.98-7.902	4.02x – 27x	29.85-4.44	5.02x – 33.75x	17.93-2.67
0.5x	3.35x – 22.5x	65.67-9.78	5.02x – 33.75	31.87-4.74	6.7x – 45x	17.91-2.67	8.37x – 56.25x	10.75-1.6
0.75x	5.02x – 33.75x	43.82-6.52	7.54x – 50.62x	21.22-3.16	10.05x – 67.5x	11.94-1.78	12.56x – 84.37x	7.17-1.07
1x	6.7x – 45x	32.84-4.89	10.05x – 67.5x	15.24-2.37	13.4x – 90x	8.96-1.33	16.75x – 112.5x	5.37-0.80
1.5x	10.05x – 67.5x	21.89-3.26	15.07x – 101.25	10.62-1.58	20.1x – 135x	5.97-0.89	25.12x – 168.75	3.58-0.53
2x	13.4x – 90x	16.42-2.44	20.1x – 135x	7.96-1.19	26.8x – 180x	4.48-0.67	33.5x – 225x	2.69-0.40

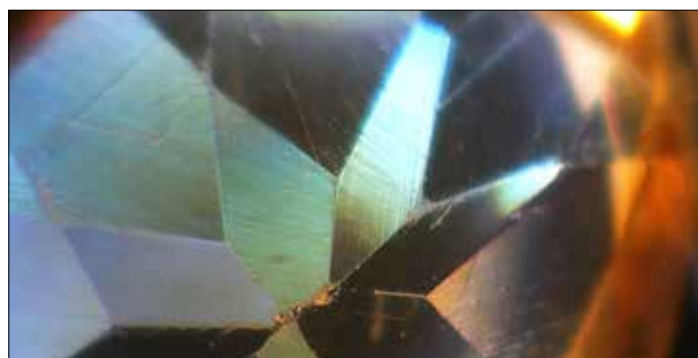
SZM-GEM-1/2 - Optical performance

Eyeiece	10x (ST-081)		15x (ST-082)		20x (ST-083)	
Field number (mm)	20		15		10	
Objective	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)
0.5x	3.5x-22.5x	57.14-8.88	5.25x-33.75x	28.57-4.44	7x-45x	14.28-2.22
0.75x	5.25x-33.75x	38.10-5.92	7.87x-50.62	19.06-2.96	10.50x-67.5x	9.52-1.48
1x	7x-45x	28.57-4.44	10.5x-67.5x	0.95-2.22	14x-90x	7.14-1.11
1.5x	10.50x-67.5x	19.05-2.96	15.75x-101.25x	9.52-1.48	21x-135x	4.76-0.74
2x	14x-90x	14.28-2.22	21x-135x	7.14-1.11	28x-180x	3.57-0.55

GEMOLOGY Series - Contrast method comparison



Citrine - OPTIGEM-2 - 0.7x zoom - Brightfield



Citrine - OPTIGEM-2 - 0.7x zoom - Darkfield

GEMOLOGY Series - Accessories

ACCESSORIES FOR OPTIGEM - 1/2

ST-201	Iris aperture diaphragm for darkfield (only for OPTIGEM 1 & 2).
ST-207	Iris aperture diaphragm for standard illuminator (only for OPTIGEM 1 & 2).
ST-202	Polarizing analysis kit (only for OPTIGEM 1 & 2).
ST-203	Glass immersion cell (only for OPTIGEM 1 & 2).
ST-204	Translating cell holder (only for OPTIGEM 1 & 2).
ST-205	Vacuum pick-up (with electric vacuum pump).
ST-081	Eyepieces (pair) WF10x/20 mm.
ST-082	Eyepieces (pair) WF15x/15 mm.
ST-083	Eyepieces (pair) WF20x/10 mm.
ST-084	Eyepiece micrometer WF10x/20 mm, 10mm/100um.
ST-086	Additional lens 1.5x (w.d. 47mm).
ST-087	Additional lens 2x (w.d. 26mm).
ST-089	Reflex camera adapter for FULL FRAME sensor.
ST-090	Focusable C-Mount adapter for 1/3" sensor.
ST-090.1	Focusable C-Mount adapter for 1/2" sensor.
M-173	Photo adapter for APS-C and Full Frame Reflex cameras.
M-114	C-Mount adapter for 1/2" sensor.
M-115	C-Mount adapter for 1/3" sensor.
M-116	C-Mount adapter for 2/3" sensor.
M-005	Micrometer slide for software calibration, 1mm/10um, 10mm/100um.
M-113.1	Ring adapter, 30mm (for monocular and binocular microscopes).
DC-002	Plastic dust cover, medium.
15104	Cleaning kit.

ACCESSORIES FOR OPTIGEM - 3/4

ST-231	Polarizing analysis kit (only for OPTIGEM 3 & 4).
ST-142	Eyepieces (pair) WF15x/16mm.
ST-143	Eyepieces (pair) WF20x/12mm.
ST-144	Eyepieces (pair) WF25x/9mm.
ST-145	Eyepiece micrometer WF10x/22mm, 10mm/100um.
SAO1.5	Additional lens 1.5x (w.d. 49mm).
SAO2	Additional lens 2x (w.d. 28mm).
ST-146	Photo adapter for REFLEX camera with FULL FRAME sensor.
ST-147	Focusable C-Mount adapter for 1/3" sensor.
ST-147.1	Focusable C-Mount adapter for 1/2" sensor.
M-621	Halogen bulb 6V/30W.
M-173	Photo adapter for APS-C and Full Frame Reflex cameras.
M-114	C-Mount adapter for 1/2" sensor.
M-115	C-Mount adapter for 1/3" sensor.
M-116	C-Mount adapter for 2/3" sensor.
M-113.1	Ring adapter, 30mm (for monocular and binocular microscopes).
M-005	Micrometer slide for software calibration, 1mm/10um, 10mm/100um.
DC-002	Plastic dust cover, medium.
15104	Cleaning kit.

ACCESSORIES FOR SZM-GEM - 1/2

ST-230	Polarizing analysis kit (only for SZM-GEM series).
ST-082	Eyepieces (pair) WF15x/15mm.
ST-083	Eyepieces (pair) WF20x/10mm.
ST-084	Eyepiece micrometer WF10x/20mm., 10mm/100um
ST-086	Additional lens 1.5x (w.d. 47mm).
ST-087	Additional lens 2x (w.d. 33mm).
ST-089	Reflex camera adapter for FULL FRAME sensor.
ST-090	Focusable C-Mount adapter for 1/3" sensor.
ST-090.1	Focusable C-Mount adapter for 1/2" sensor.
M-173	Photo adapter for APS-C and Full Frame Reflex cameras.
M-114	C-Mount adapter for 1/2" sensor.
M-115	C-Mount adapter for 1/3" sensor.
M-116	C-Mount adapter for 2/3" sensor.
M-113.1	Ring adapter, 30mm (for monocular and binocular microscopes).
M-005	Micrometer slide for software calibration, 1mm/10um, 10mm/100um.
DC-002	Plastic dust cover, medium.
15104	Cleaning kit.

15104 - Cleaning kit

It cleans glass quickly and effectively, without leaving residue or odor. Ideal for precision lens or prism cleaning.



How to connect the cameras to our microscopes.

Please refer to the Adapter reference list on Digital section.

X SERIES



Microscopes For Industry And Quality Control

XC-100L / XZ-1 / XZ-2

X Series - Range

This series has been designed to handle and observe samples of any dimension. Industrial microscopes incorporate many complex designs that aim to improve resolution and sample contrast. From models designed for routine analysis up to models dedicated to industrial laboratory and quality control, OPTIKA Microscopes is able to satisfy any demand in this field.

XC-100L



Portable microscope but also a **multifunctional testing instrument** for applications where magnifying-glasses are not good enough, such as quality control in mechanical, engraving and printing industry. It has to be used **directly on the specimen** to be inspected and it is equipped with WF10x/15.5mm **micrometric eyepiece** with cross divided into 0.1 millimeter. Powered by an inclined **adjustable xenon penlight**.

XZ-1



Bench-top monocular microscope offering **reliable image information in 2D and 3D**, being ideal for **measuring and viewing surfaces** with a zoom objective. It comes with WF10x/18mm **micrometric eyepiece** with cross divided into 0.1 millimeter and a double lighting unit with **halogen incident and transmitted light**.



X Series - Range

XZ-2



Bench-top binocular microscope offering **reliable image information in 2D and 3D**, being ideal for **measuring and viewing surfaces** with a zoom objective. It comes with a **CCD camera** (380 lines), **8" TFT LCD screen** and **LED ring light generator with brightness control** for incident illumination.

X Series - Comparison chart

Model	Head	Eyepiece	Objectives	Working Distance	Stand	Illumination
XC-100L	Monocular	WF10x/18mm micrometric	10x	7,7 mm	Portable stand	Incident illumination: xenon penlight
XZ-1	Monocular	WF10x/18mm	0,7x....4,5x zoom	90 mm	Pillar stand	Incident illumination: halogen bulbs 12V/10W Transmitted illumination: halogen bulbs 12V/10W
XZ-2	Binocular	WF10x/18mm	0,7x.... 4,5x zoom	96 mm	Pillar stand with 8" TFT LCD sceen	Incident illumination: LED ring light with brightness control

X Series - Accessories

ACCESSORIES FOR XC-100L

M-899	Pen illuminator.
M-004	Eyepiece micrometer WF10x/18mm.
M-114	C-Mount adapter for 1/2" sensor.
M-115	C-Mount adapter for 1/3" sensor.
M-116	C-Mount adapter for 2/3" sensor.
M-173	Photo adapter for APS-C and Full Frame Reflex cameras.
M-005	Micrometer slide for software calibration, 1mm/10um, 10mm/100um.

ACCESSORIES FOR XZ-1

M-001	Eyepiece H5x.
M-003	Eyepiece WF16x/12mm.
ST-012	White/black stage plate, 95mm diameter.
ST-014	Glass stage, 95 mm diameter.
ST-028	Halogen bulb 12V/10W.
M-013	Halogen bulb 12V/10W, with dichroic mirror.
DC-002	Plastic dust cover, medium.
M-114	C-Mount adapter for 1/2" sensor.
M-115	C-Mount adapter for 1/3" sensor.
M-116	C-Mount adapter for 2/3" sensor.
M-173	Photo adapter for APS-C and Full Frame Reflex cameras.
M-005	Micrometer slide for software calibration, 1mm/10um, 10mm/100um.

ACCESSORIES FOR XZ-2

M-001	Eyepiece H5x.
M-003	Eyepiece WF16x/12mm.
M-004	Eyepiece micrometer WF10x/18mm.
M-114	C-Mount adapter for 1/2" sensor.
M-115	C-Mount adapter for 1/3" sensor.
M-116	C-Mount adapter for 2/3" sensor.
M-173	Photo adapter for APS-C and Full Frame Reflex cameras.
M-005	Micrometer slide for software calibration, 1mm/10um, 10mm/100um.

15104 - Lens cleaner, 50ml

It cleans glass quickly and effectively, without leaving residue or odor. Ideal for precision lens or prism cleaning.



How to connect the cameras to our microscopes.

Please refer to the Adapter reference list on Digital section.