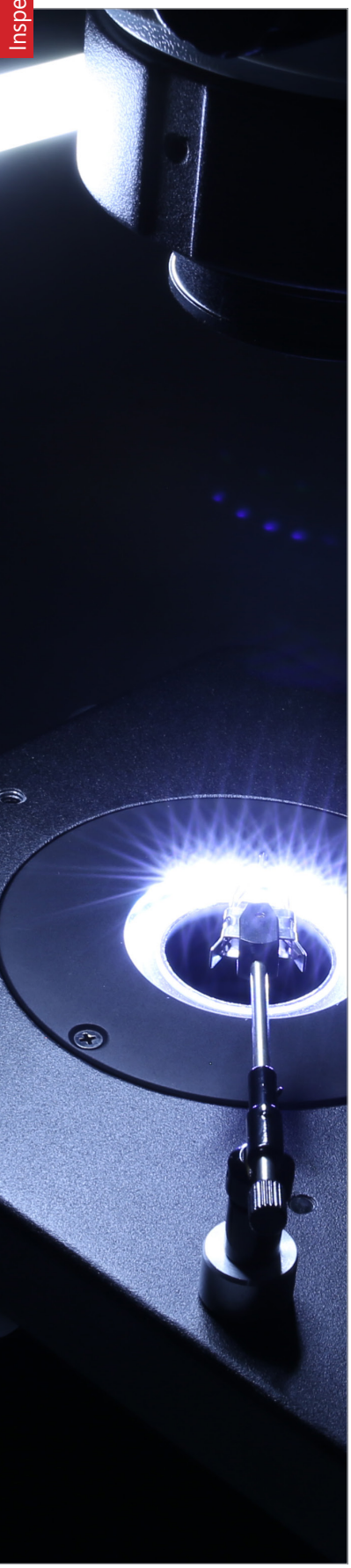
OPTIKA®
MICROSCOPES
ITALY

GEM Series

Stereozoom Microscopes For Gemology

GEM Series



As a leading company in the supply of gemological microscopes, OPTIKA offers a series of microscopes purposely designed for this sector by using both brightfield and darkfield methods OPTIGEM-10 and OPTIGEM-20. This series 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.

Specifically Designed for Specialists

Gemological stereomicroscopes are meant to help with stone inspection. 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-10 & OPTIGEM-20 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 tecnique

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 10 & 20. They come with a special optical condenser configuration to ensure real, perfect darkfield application (see the dedicated chapter for further information).

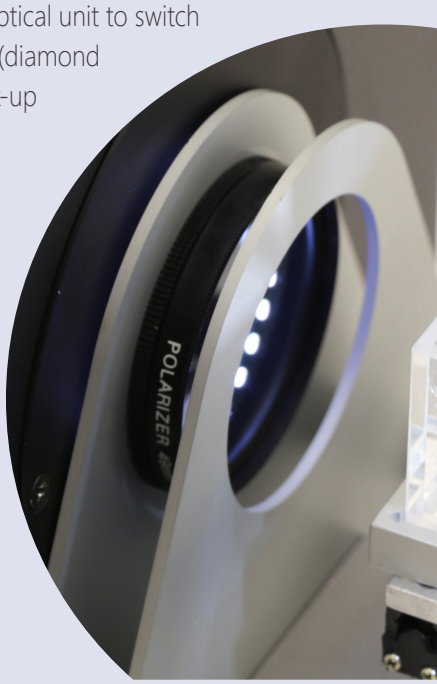
Stereozoom Microscopes For Gemology

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.

With darkfield observation, the unscattered beams from the image are excluded: as a result, the field around the specimen is generally dark.
An additional flexible arm and velvet-field slider produce extra contrast for crisp and vibrant images. The illumination of OPTIGEM microscopes is greatly performing and this brings this series to be ideal for precious stones and jewels evaluation.

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 immesion cells complete and enhance the OPTIGEM-10 & OPTIGEM-20 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.

GEM 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 OPTIGEM-10.
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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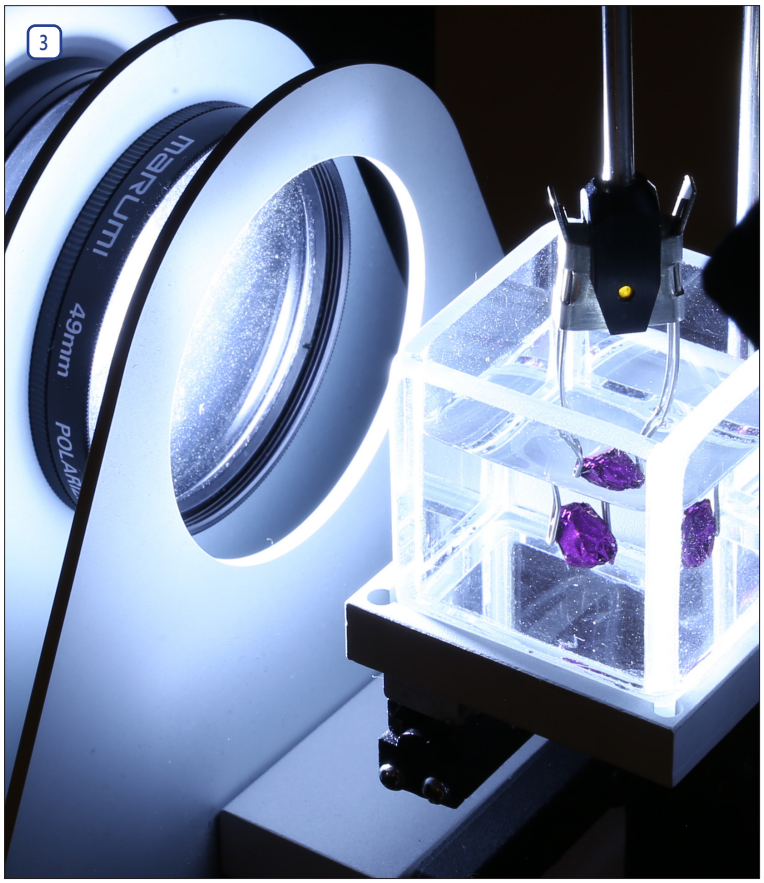

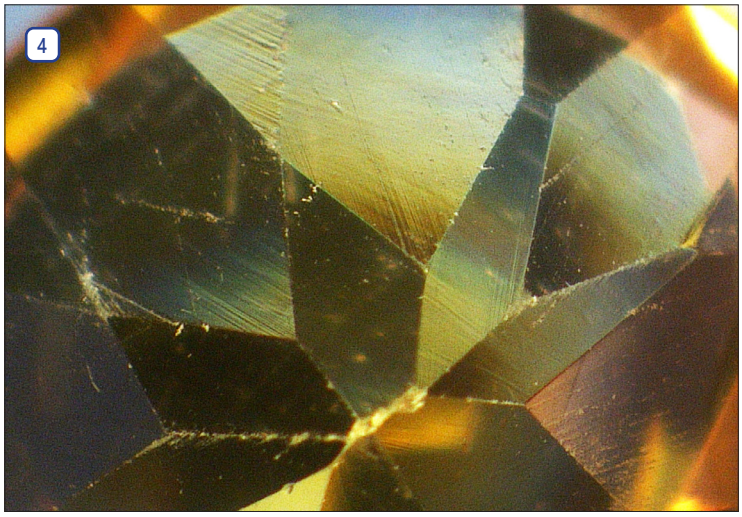
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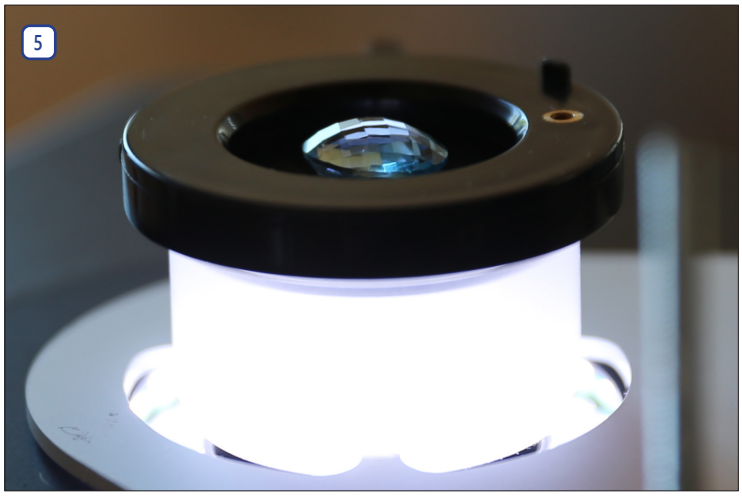
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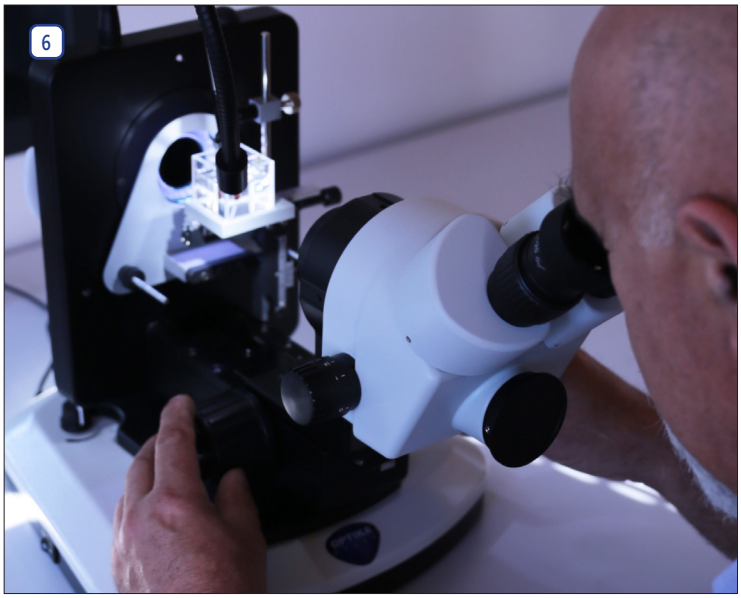
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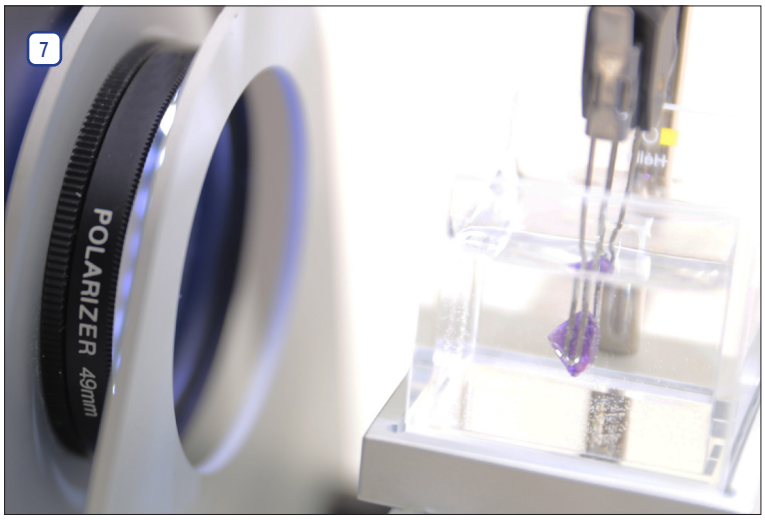

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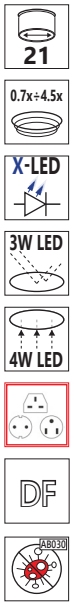
GEM Series - **OPTIGEM10** model

Binocular gemological stereomicroscopes for brightfield and darkfield applications with special side-emitting **LED** illumination ring for true darkfield illumination. Equipped also with **4 incident LED** flexible arm and a diffusive **LED** disc for transmitted illumination.
The instrument can be easily tilted horizontally for immersion analysis.

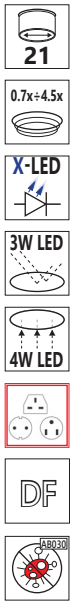


Part	Description
Observation mode:	Brightfield, darkfield.
Heads	Binocular, 45° inclined, 360° rotating.
Interpupillary distance:	Adjustable between 51 and 75 mm
Dioptric adjustment:	On both eyepiece tubes.
Eyepieces:	WF10x/21 mm, high eye-point.
Objective:	Parfocal achromatic zoom 0.7x...4.5x (zoom factor 6.43:1).
Working distance:	100 mm
Specimen stage:	Gemological stage, with clamp for holding gems.
Focusing:	Rack and pinion mechanism controlled by a pair of knobs.
Stand:	Fixed arm stand with tilting system (with position lock control). It can be totally overturned and rotated allowing in this way to obtain a 2-in-one instrument: an instrument for standard observations and one for observation of water-immersed gems.

Part	Description
Darkfield illumination:	Equipped with a state-of-the-art illuminator for darkfield observation. It consist of an innovative side-emmiting LEDs ring with an emission angle of 38°. With brightness control.
Transmitted light llumination:	Equipped with a LED illuminator, located under the stage. With brightness control.
Incident illumination:	Equipped with a flexible gooseneck-arm 4-LED illuminator. With brightness control.
Color temperature:	Pure white 6,300 K

GEM Series - **OPTIGEM20** model

Trinocular gemological stereomicroscopes for brightfield and darkfield applications with special side-emitting **LED** illumination ring for true darkfield illumination. Equipped also with **4 incident LED** flexible arm and a diffusive **LED** disc for transmitted illumination.
The instrument can be easily tilted horizontally for immersion analysis.



Part	Description
Observation mode:	Brightfield, darkfield.
Heads	Trnocular, 45° inclined, 360° rotating.
Interpupillary distance:	Adjustable between 51 and 75 mm
Dioptric adjustment:	On both eyepiece tubes.
Eyepieces:	WF10x/21 mm, high eye-point.
Objective:	Parfocal achromatic zoom 0.7x...4.5x (zoom factor 6.43:1).
Working distance:	100 mm
Specimen stage:	Gemological stage, with clamp for holding gems.
Focusing:	Rack and pinion mechanism controlled by a pair of knobs.
Stand:	Fixed arm stand with tilting system (with position lock control). It can be totally overturned and rotated allowing in this way to obtain a 2-in-one instrument: an instrument for standard observations and one for observation of water-immersed gems.

Part	Description
Darkfield illumination:	Equipped with a state-of-the-art illuminator for darkfield observation. It consist of an innovative side-emmiting LEDs ring with an emission angle of 38°. With brightness control.
Transmitted light llumination:	Equipped with a LED illuminator, located under the stage. With brightness control.
Incident illumination:	Equipped with a flexible gooseneck-arm 4-LED illuminator. With brightness control.
Color temperature:	Pure white 6,300 K

GEM Series - Comparison chart

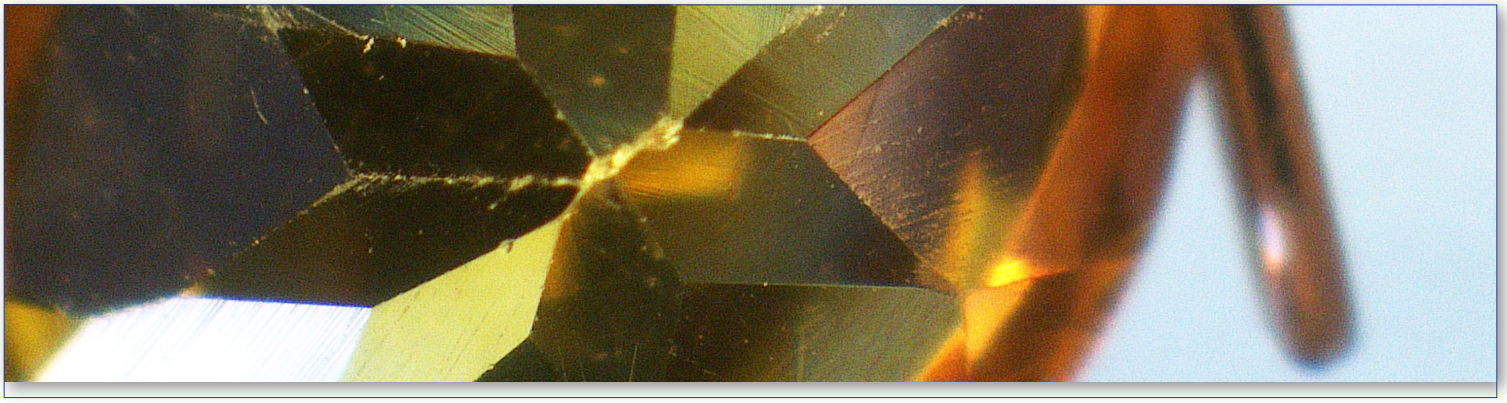
Model	Head	Eyepieces	Objective	Stand	Illumination
OPTIGEM-10	Binocular, 360° rotating, 45° inclined	Wide Field 10x/21mm	0.7 .... 4.5x Zoom	Gemological stand	**Incident illumination:** 4 LED flexible arm with brightness adjustment. **Transmitted illumination:** Diffusive LED disc for observation in brightfield and side-emitting LED ring for observation in darkfield.
OPTIGEM-20	Trinocular, 360° rotating, 45° inclined	Wide Field 10x/21mm	0.7 .... 4.5x Zoom	Gemological stand	**Incident illumination:** 4 LED flexible arm with brightness adjustment. **Transmitted illumination:**Diffusive LED disc for observation in brightfield and side-emitting LED ring for observation in darkfield.

GEM Series - Optical Performance

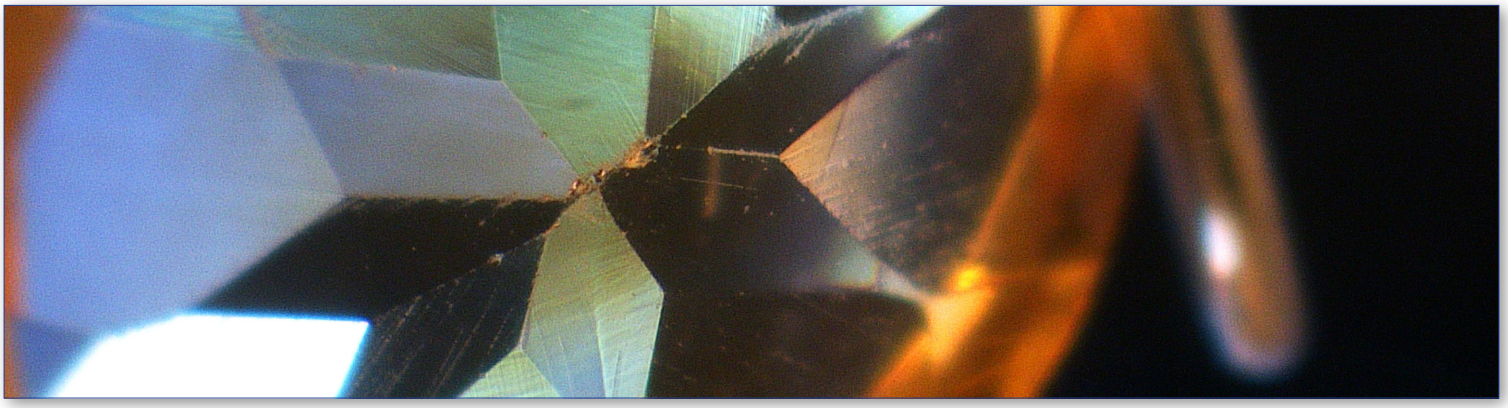
OPTIGEM-10 / OPTIGEM-20 - Optical performance

Eyepiece	10x (ST-081)		15x (ST-082)		20x (ST-083)	
Field number (mm)	21		15		10	
Objective	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)
0.5x (W.D. 165 mm)	3.5x-22.5x	60.00-9.23	5.25x-33.75x	42.86-6.67	7x-45x	28.57-4.44
0.75x (W.D. 117 mm)	5.25x-33.75x	40.00-6.22	7.875x-50.625x	28.57-4.44	10.50x-67.5x	19.05-2.96
1x (W.D. 100 mm)	7x-45x	30.00-4.66	10.5x-67.5x	21.43-3.33	14x-90x	14.29-2.22
1.5x (W.D. 47 mm)	10.50x-67.5x	20.00-3.11	15.75x-101.25x	14.29-2.22	21x-135x	9.52-1.48
2x (W.D. 33 mm)	14x-90x	15.00-2.33	21x-135x	10.71-1.67	28x-180x	7.14-1.11

GEM Series - Contrast method comparison



Citrine - OPTIGEM-20 - 0.7x zoom - Brightfield



Citrine - OPTIGEM-20 - 0.7x zoom - Darkfield

GEM Series - Accessories

Eyecups & Eyepieces

ST-081	EW10x/21 eyepieces (pair), high eyepoint, with rubber cup
ST-082	WF15x/15 eyepieces (pair), high eyepoint
ST-083	WF20x/10 eyepieces (pair), high eyepoint
ST-084	WF10x/21 micrometric eyepiece, high eyepoint, with rubber cup

Additional Lenses

ST-086	Additional lens 1.5x (w.d. 45mm)
ST-087	Additional lens 2x (w.d. 33mm)

Condenser & Filters

ST-202	Polarizing analisys kit

Camera Adapters

M-113.1	Ring adapter, 30mm (for monocular and binocular microscopes)
M-115	0.35x C-Mount projection lens
M-114	0.5x C-Mount projection lens
M-118	0.75x C-Mount projection lens
M-173	C-Mount projection lens for APS-C/full frame reflex cameras (trino)
M-699	Universal adapter for C-Mount projection lens (trino)
M-620	0.35x focusable C-Mount adapter
M-620.1	0.5x focusable C-Mount adapter
M-620.2	0.65x focusable C-Mount adapter
M-620.3	1x focusable C-Mount adapter

Miscellaneous

15104	Cleaning kit
DC-002	Plastic dust cover, medium, 490(l)x490(h) mm
M-005	Micrometric slide, 26x76mm, with 2 scales (1mm/100 & 10mm/100)
ST-092	Protective glass for stereohead
ST-201	Iris aperture diaphragm for darkfield
ST-203	Glass immersion cell
ST-204	Translating cell holder
ST-205	Vacuum pick-up (with electric vacuum pump)
ST-207	Iris aperture diaphragm for brightfield
AB-030	Antibacterial surface treatment, only for newly purchased microscope

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.

v 6.8.0 - OPTIKA reserves the right to make corrections, modifications, enhancements, improvements and other changes to its products at any time without notice.

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