



# Leica MZ APO

Apochromatic Stereomicroscope  
for Specialists in Science and Research

*Leica*  
MICROSYSTEMS

# The vision

## Leading technology from Leica Microsystems

Leica Microsystems, the leading brand for microscopes and scientific instruments, offers the M-Series, a range of stereomicroscopes covering all requirements and applications in science and technology. The Leica MZ APO stereomicroscope with 100% apochromatic correction throughout the image-forming optics, apochromatic 10:1 zoom and apochromatic ErgoTube™ is the leading instrument in the M-Series, and is clear evidence of Leica's innovative superiority. In terms of image contrast, brilliance, sharpness, resolution, color fidelity and imaging accuracy, the Leica MZ APO is unrivalled.

The Leica MZ APO is a unique stereomicroscope for the discriminating user; its excellent performance and its many user benefits redefine "state of the art" for stereomicroscope imaging.

### **For specialists**

Its performance and value make the Leica MZ APO a necessity for specialists involved in quality control and in R & D, because non-destructive techniques enables them to examine critical objects in three dimensions without special preparation.

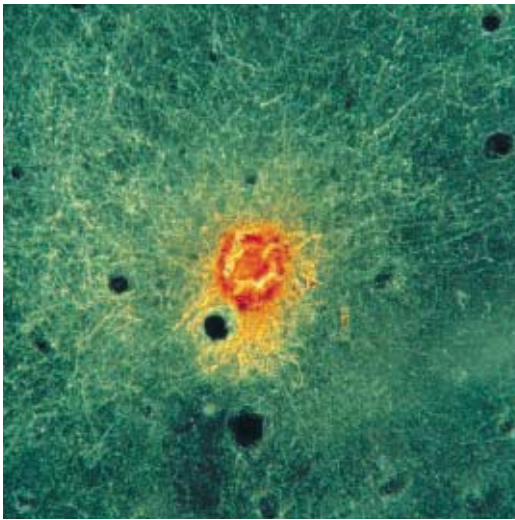
Leica has established sophisticated manufacturing processes to meet stringent performance and specification criteria without compromise. New glass and optical matching with accuracies approaching the wavelengths of light, contribute to unsurpassed resolution, image contrast and sharpness.

### **Expanding into the future**

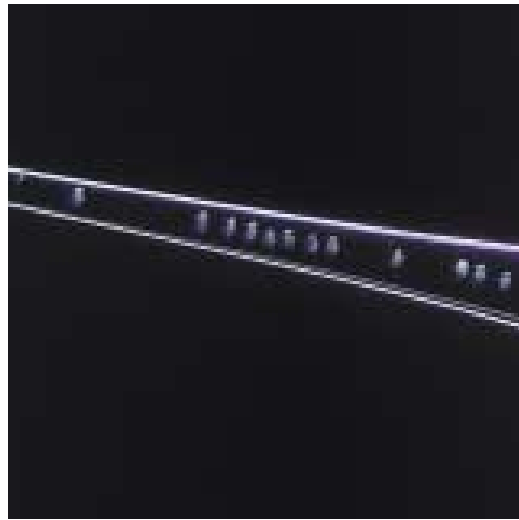
The Leica MZ APO's modular design perfectly meets tomorrow's requirements. Leica offers a wide selection of accessories for all tasks in investigation and documentation. Leica possesses the greatest range of objectives, binocular tubes and video-/phototubes. Also available are ErgoModules™, motor focus, modern cameras for digital imaging as well as software for archiving and image processing, video and photomicrography equipment, and accessories for dual-station viewing, drawing, fluorescence, etc.

An aesthetic design and the latest optical technology: Apochromatic optical system, apochromatic 10:1 zoom, apochromatic ErgoTube™ 10° – 50° and planapochromatic objectives. The Leica MZ APO is in a class by itself.

Monkey, nerve  
cells in brain



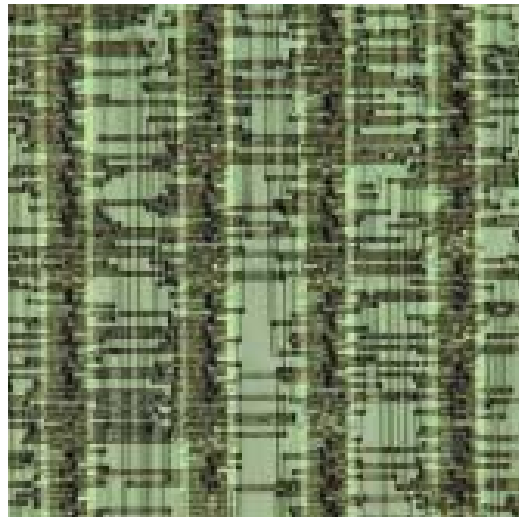
Mouse embryo



Carp fin



Circuit board



Leica MZ APO with ErgoTube™  
10° – 50°, 1.0× planapochromatic  
objective, high-performance stand HL  
for transmitted-light (bright field),  
and focusing drive (coarse/fine)

Leica Design  
by Ernest Igl/Christophe Apothéloz





# The optics

## The ultimate in 3D perception

Optical systems from Leica are the benchmark of first-class imaging. For example, the technologically-demanding optical concept of the Leica MZ APO, produces images with levels of contrast and brilliance which are unsurpassed, both visually and photographically. The entire imaging system is apochromatically corrected, including the objective, the zoom and the ErgoTube™.

### Best image information

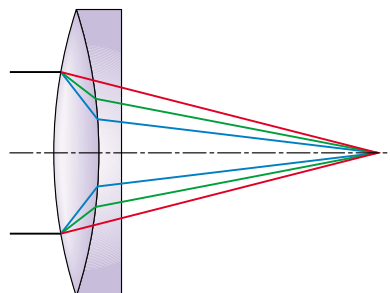
The Leica MZ APO demonstrates the outstanding technological knowledge and specialized expertise of Leica Microsystems in the field of microscopy. The new 1.0× and 0.63× planapochromatic objectives provide unbeatable color correction and reproduction of the finest details, right to the limits of resolution. The Leica MZ APO is ideally suited for observing transparent, low-contrast objects such as those found in medicine and biology. Also, the planapochromatic objectives correct the field, so that flat objects such as thin tissue sections, semiconductor wafers, integrated circuits or polished metal sections are imaged not only sharply, but also uniformly flat throughout the entire field of view.

### Precision in all fields

The Leica MZ APO provides the observer with stereoscopic information about the general appearance and form of an object at low magnification. At high magnification, it supplies detailed information about discrete features. The magnification range of the Leica MZ APO is 8× to 80× (with 1.0× objective and 10× eyepieces); with optical accessories a total magnification of 512× is possible. The 0.2 numerical aperture enables a resolution as high as 600 line-pairs per millimeter, making the additional use of a classical microscope unnecessary in some instances.

### Commitment to Quality

At Leica, the newest technologies are used for development, manufacturing and inspection. Every stereomicroscope and each individual component is manufactured not only with the tightest tolerances, but also with environmentally-friendly manufacturing practices. Leica Microsystems has quality programs in place which exceed the international standards ISO 9001 and ISO 14001, relating to quality management and environmental management.



Apochromatic optics are characterized by a high level of correction for longitudinal chromatic aberration and for color fringing. The resulting contour sharpness ensures that even the finest detail is crisp and sharp. All objectives are lead-free.



# The modular program

## One stereomicroscope, many uses

Productive performance with correct results depends on the best possible custom configuration of the stereomicroscope station. The Leica MZ APO is also outstanding in this respect. The common main objective (CMO) principle ensures fatigue-free viewing over long periods, and the unequalled range of binocular tubes and Ergo-Modules™ provide ergonomic adaptations to the workplace. The viewing angle of the apchromatic ErgoTube™ is continuously variable from 10° to 50°, enabling any user to shift the viewing angle and viewing height to the most comfortable position for the individual.

### Designed for peoples' differences

The design supports ergonomic, fatigue-free working. The contoured shapes and the modern materials used for the Leica MZ APO combine to promote easy operation. The ergonomic, low-positioned focusing knobs enable the user's hands to be comfortably supported. The focusing drive is available with coarse/fine manual focusing or motor-driven focusing, and uses the entire length of the column, so that every focusing at all zoom positions is precise and fast.

### Choices for stand and illumination

Leica has designed the stands and illuminators as interchangeable building blocks; modules which enable the MZ APO stereomicroscope to be conveniently equipped for every application in science and technology. For example, the high-performance transmitted light stands ensure the best-possible illumination of transparent specimens in both bright- and darkfield or in polarized light. The swing-arm stand provides room for bulky objects such as circuit boards or rocks, whose images can be brought into sharp focus with the motor-focus mechanism.

The coaxial illuminator brings out the contrasts on flat, highly-reflecting surfaces such as wafers or polished metal sections. The fluorescence illuminator, combines with various filter sets (e.g. GFP), to facilitate the differentiation of highly detailed fluorescing structures.

- 1 Leica DC digital camera system
- 2 Fluorescence module with various filter combinations (e.g. GFP) for the differential observation of fine fluorescing structures
- 3 Motor focus for effortless focusing and for repetitive tasks
- 4 Low-positioned coarse and fine drive on incident-light stand, for ergonomic focusing with the hands supported
- 5 Leica MPS60 photoautomat (shutterpiece with 1% spot measurement)
- 6 Leica IC A integrated analog video camera
- 7 Top optics from Leica: Lead-free planachromatic and planapochromatic objectives for high information yield
- 8 Transmitted-light stand for bright- and darkfield with rotatable polarization stage for double-refracting materials





# The Leica MZ APO: A fine example of ergonomics and versatility



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# The imaging systems

## Digital technology for professional perspectives

By introducing digital imaging to its stereo-microscopes, Leica has ushered in a new era for image processing in professional microscopy. Digital imaging shortens work processes, saves cost, and does not involve chemical processing. Leica provides stereomicroscopes, CCD cameras and image managers from the same source, and has designed the optics and the software specially for microscopy.

### **Leica digital imaging systems**

Leica Microsystems offers a complete and modular system for professional recording, archiving, analyzing, and processing of electronic images. The new Leica DC 150 (6 megapixels), Leica DC 300 (7.2 megapixels), Leica DC 300F (fluorescence, 2.9 megapixels), Leica DC 350F (fluorescence, 2.9 megapixels, black & white), and Leica DC 500 (12 megapixels) digital imaging systems provide customized, future-oriented solutions for all applications in research, development, industry, biology and medicine.

### **Leica Image Manager for professional archiving, handling and analyzing of electronic images**

The Leica software "Image Manager" includes various modules for activities ranging from storage and post-processing of images up to complex networking.

### **Leica IC A video system**

With the Leica IC A, an integrated video module in the high-performance class, workstations can be equipped ergonomically and economically without using additional adapters. The Leica IC A opens up new perspectives for image analysis in science and in quality control, as well as for live presentations to large audiences and digital post-processing.

### **Leica MPS60 photoautomat**

If documenting on conventional film, Leica offers a range of advanced systems. The Leica MPS60 uses 1% spot metering and directs 100% of the light to the highly-sensitive measuring diode, enabling perfect photographs to be taken using short exposure times, even under the low-light conditions of fluorescence applications.

Leica DC digital imaging system,  
Leica MZ APO with trinocular video-/  
phototube and fluorescence module



## The details

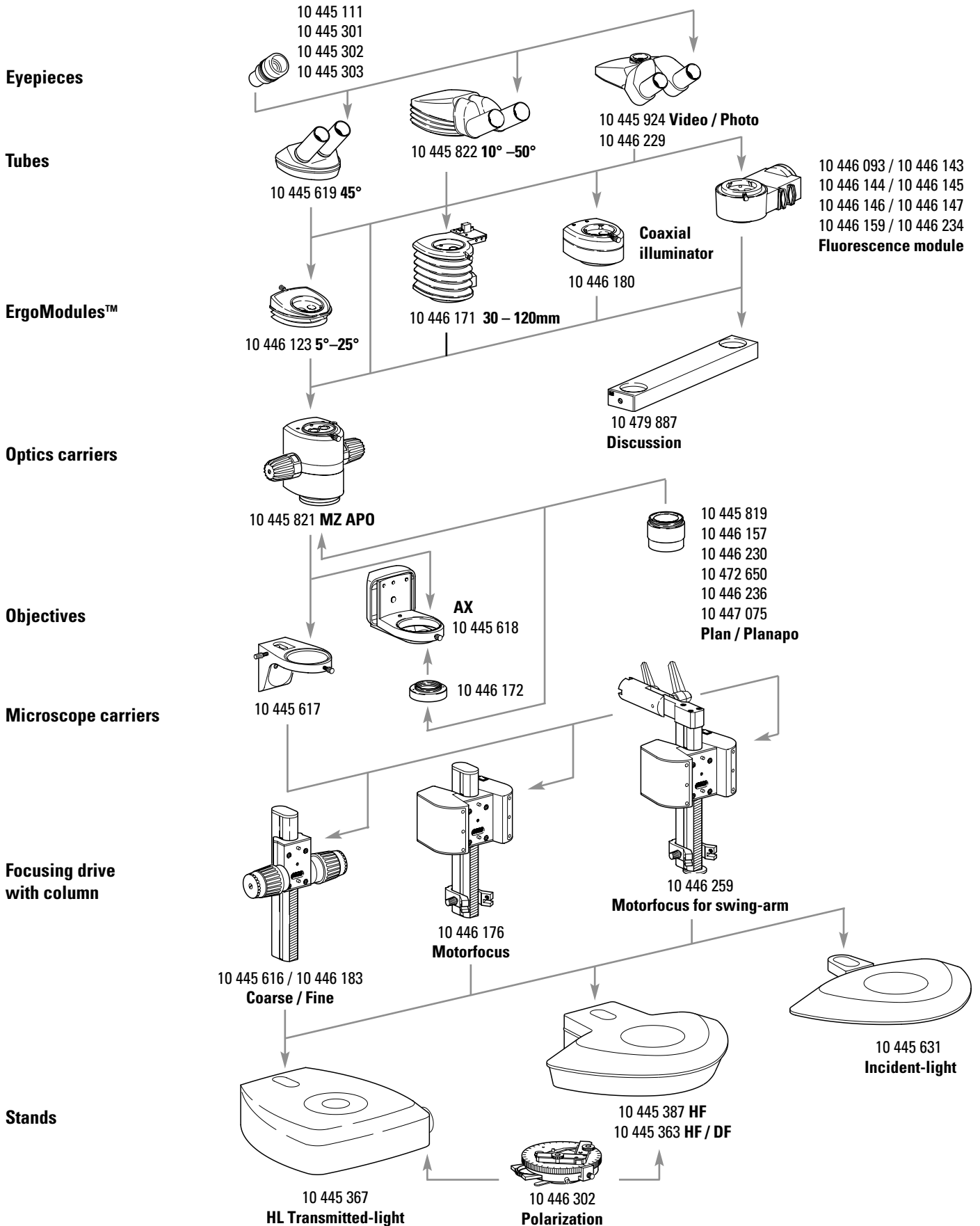
### Leica MZ APO stereomicroscope

Design principle	Apochromatic, multiple-coated, high-performance optical system with two parallel beam paths and one main objective (CMO), lead-free
Numerical aperture	0.125 with 1.0× planapochromatic objective 0.2 with 1.6× planapochromatic objective
Resolution	375 line-pairs / mm with 1.0× planapochromatic objective, 600 line-pairs / mm with 1.6× planapochromatic objective
Magnification changer, adjustable magnification scale	Apochromatic zoom 10:1, 0.8×–10×
9 engageable ratchet positions	at 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 6.3
Magnifications	8× to 80× (with 1.0× objective and 10× eyepieces)
Total magnification	5× to 512×
Field diameter	0.5mm to 41.2mm
Working distances	97mm (0.63× planapo), 55mm (1.0× planapo), 19mm (1.6× planapo), 112mm (0.8× plano) Various working distances from 91m to 400mm (achromats)
Planapochromatic objectives	0.63×, 1.0×, 1.6×, 0.8× plano, lead-free
Wide-field eyepieces for eyeglass wearers	Distortion free, 10×/21B, 16×/14B, 25×/9.5B, 40×/6B
Dioptic correction	+5 to –5
Eyecups	Variable degree of eye contact
Binocular tubes	Apochromatic ErgoTube™ 10° to 50° with synchronized interpupillary adjustment, various ErgoModules™ for variable viewing angles and viewing heights
Interpupillary distance	52 to 76mm
<b>Stands, illuminators</b>	
Focusing drive	Coarse/fine, manual and motorized
Incident-light stand	300mm and 500mm side-faced columns
Microscope carrier	Two basic heights, optics carrier rotatable through 360°, stereoscopic and vertical observation
Swing-arm stand	Column 550/50mm, version with table clamp 20–50mm, motor focus
Universal stand	450/50mm or 800/50mm column, magnetic carrier for stages
Transmitted-light stands	Brightfield, bright- and darkfield, high-performance base
Stages	Various, including rotatable polarization stage
Incident lamps	Inclined, coaxial, vertical, fiber-optic, and fluorescence module
<b>Accessories</b>	
Photomicrography systems	Leica MPS30 and MPS60, fully automatic, with data back
Video, filming, archiving software	Various configurations, Leica IC A integrated video module, Leica DC digital imaging systems, Image manager
Equipment for second observer	For training and education
Drawing tube	For both left- and right-handed users
Double-iris diaphragm	For increasing the depth of field
Measuring graticules	For measuring lengths and for counting
Vertical and oblique observation	45° view by moving the optics rather than the specimen

For more detailed information, please ask for the brochure "Modular System" (M1-105-4en).

Quality comes first: When manufacturing components, Leica has access to an infrastructure which meets the most stringent demands, without compromise. Perfection is ensured by certified quality-assurance systems.

# Leica, the standard for individual solutions

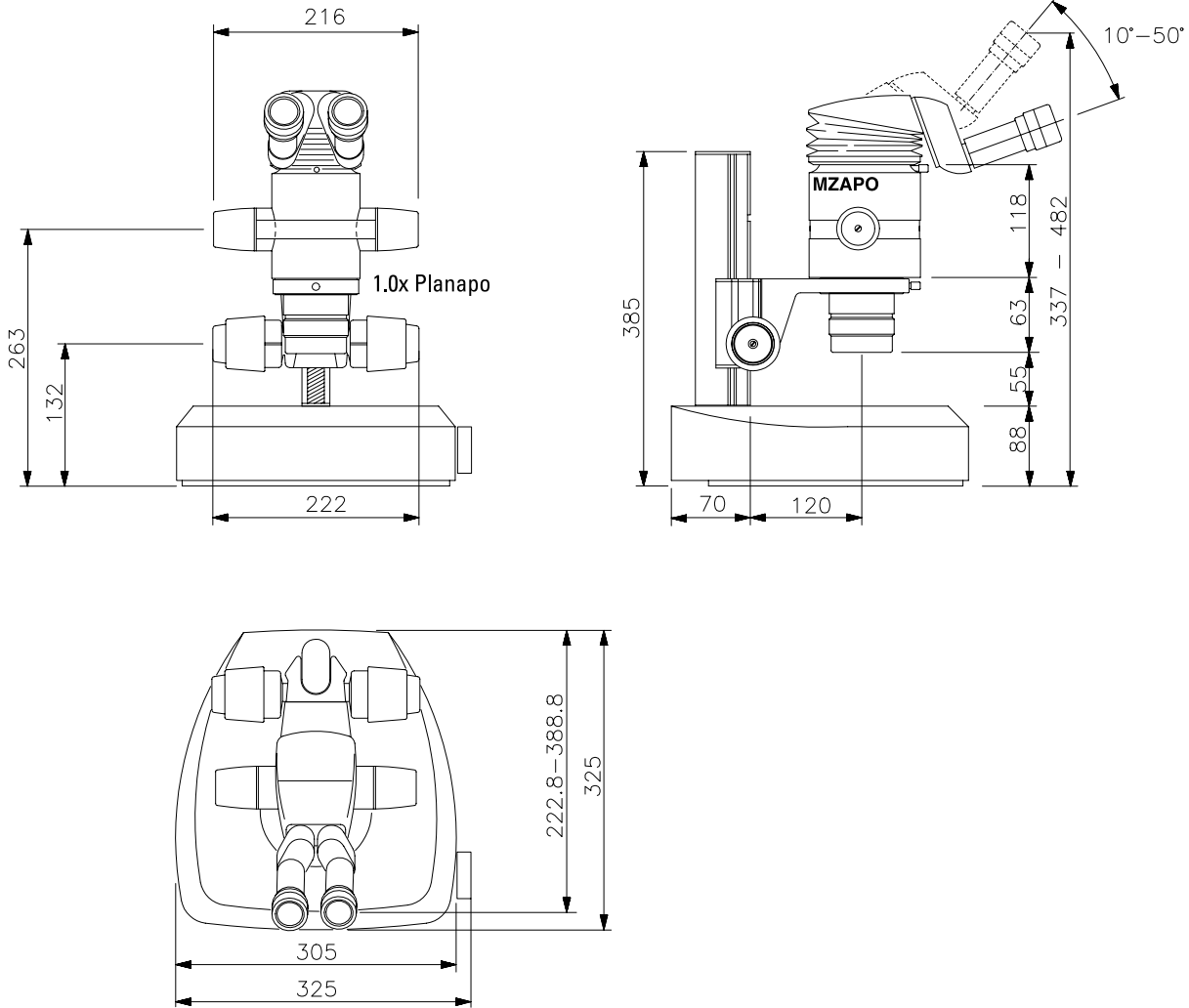


# The data

Objectives		1.0× Plan 1.0× Planapo		0.5× Plan		0.63× Planapo		0.8× Plan		1.6× Planapo	
Eyepieces	Magnification changer position	Working distances (mm)									
		60 Plan 55 Planapo		135 Plan		97 Planapo		112 Plan		19 Planapo	
		Total magnification	Field diameter (mm)	Total magnification	Field diameter (mm)	Total magnification	Field diameter (mm)	Total magnification	Field diameter (mm)	Total magnification	Field diameter (mm)
10×/21B	0.8	8.0	26.3	4.0	52.5	5.1	41.2	6.4	32.8	12.8	16.4
	1.0	10.0	21.0	5.0	42.0	6.4	32.8	8.0	26.3	16.0	13.1
	1.25	12.5	16.8	6.3	33.3	8.0	26.3	10.0	21.0	20.0	10.5
	1.6	16.0	13.1	8.0	26.3	10.2	20.6	12.8	16.4	25.6	8.2
	2.0	20.0	10.5	10.0	21.0	12.8	16.4	16.0	13.1	32.0	6.6
	2.5	25.0	8.4	12.5	16.8	16.0	13.1	20.0	10.5	40.0	5.3
	3.2	32.0	6.6	16.0	13.1	20.5	10.2	25.6	8.2	51.2	4.1
	4.0	40.0	5.3	20.0	10.5	25.6	8.2	32.0	6.6	64.0	3.3
	5.0	50.0	4.2	25.0	8.4	32.0	6.6	40.0	5.3	80.0	2.6
	6.3	63.0	3.3	31.5	6.7	40.3	5.2	50.4	4.2	100.8	2.1
8.0	80.0	2.6	40.0	5.3	51.2	4.1	64.0	3.3	128.0	1.6	
16×/14B	0.8	12.8	17.5	6.4	35.0	8.2	27.3	10.2	22.0	20.5	10.9
	1.0	16.0	14.0	8.0	28.0	10.2	22.0	12.8	17.5	25.6	8.8
	1.25	20.0	11.2	10.0	22.4	12.8	17.5	16.0	14.0	32.0	7.0
	1.6	25.6	8.8	12.8	17.5	16.4	13.7	20.5	10.9	41.0	5.5
	2.0	32.0	7.0	16.0	14.0	20.5	10.9	25.6	8.8	51.2	4.4
	2.5	40.0	5.6	20.0	11.2	25.6	8.8	32.0	7.0	64.0	3.5
	3.2	51.2	4.4	25.6	8.8	32.8	6.8	41.0	5.5	81.9	2.7
	4.0	64.0	3.5	32.0	7.0	41.0	5.5	51.2	4.4	102.4	2.2
	5.0	80.0	2.8	40.0	5.6	51.2	4.4	64.0	3.5	128.0	1.8
	6.3	100.8	2.2	50.4	4.4	64.5	3.5	80.6	2.8	161.3	1.4
8.0	128.0	1.8	64.0	3.5	81.9	2.7	102.4	2.2	204.8	1.1	
25×/9.5B	0.8	20.0	11.9	10.0	23.8	12.8	18.6	16.0	14.8	32.0	7.4
	1.0	25.0	9.5	12.5	19.0	16.0	14.8	20.0	11.9	40.0	5.9
	1.25	31.3	7.6	15.6	15.2	20.0	11.9	25.0	9.5	50.0	4.8
	1.6	40.0	5.9	20.0	11.9	25.6	9.3	32.0	7.4	64.0	3.7
	2.0	50.0	4.8	25.0	9.5	32.0	7.4	40.0	5.9	80.0	3.0
	2.5	62.5	3.8	31.3	7.6	40.0	5.9	50.0	4.8	100.0	2.4
	3.2	80.0	3.0	40.0	5.9	51.2	4.6	64.0	3.7	128.0	1.9
	4.0	100.0	2.4	50.0	4.8	64.0	3.7	80.0	3.0	160.0	1.5
	5.0	125.0	1.9	62.5	3.8	80.0	3.0	100.0	2.4	200.0	1.2
	6.3	157.5	1.5	78.8	3.0	100.8	2.4	126.0	1.9	252.0	0.9
8.0	200.0	1.2	100.0	2.4	128.0	1.9	160.0	1.5	320.0	0.7	
40×/6B	0.8	32.0	7.5	16.0	15.0	20.5	11.7	25.6	9.4	51.2	4.7
	1.0	40.0	6.0	20.0	12.0	25.6	9.4	32.0	7.5	64.0	3.8
	1.25	50.0	4.8	25.0	9.6	32.0	7.5	40.0	6.0	80.0	3.0
	1.6	64.0	3.8	32.0	7.5	41.0	5.9	51.2	4.7	102.4	2.3
	2.0	80.0	3.0	40.0	6.0	51.2	4.7	64.0	3.8	128.0	1.9
	2.5	100.0	2.4	50.0	4.8	64.0	3.8	80.0	3.0	160.0	1.5
	3.2	128.0	1.9	64.0	3.8	81.9	2.9	102.4	2.3	204.8	1.2
	4.0	160.0	1.5	80.0	3.0	102.4	2.3	128.0	1.9	256.0	0.9
	5.0	200.0	1.2	100.0	2.4	128.0	1.9	160.0	1.5	320.0	0.8
	6.3	252.0	1.0	126.0	1.9	161.3	1.5	201.6	1.2	403.2	0.6
8.0	320.0	0.8	160.0	1.5	204.8	1.2	256.0	0.9	512.0	0.5	



## Leica MZ APO: The dimensions



The Business Units in Leica Microsystems hold the management system certificates for the international standards ISO 9001 and ISO 14001 relating to quality management, quality assurance and environmental management.

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