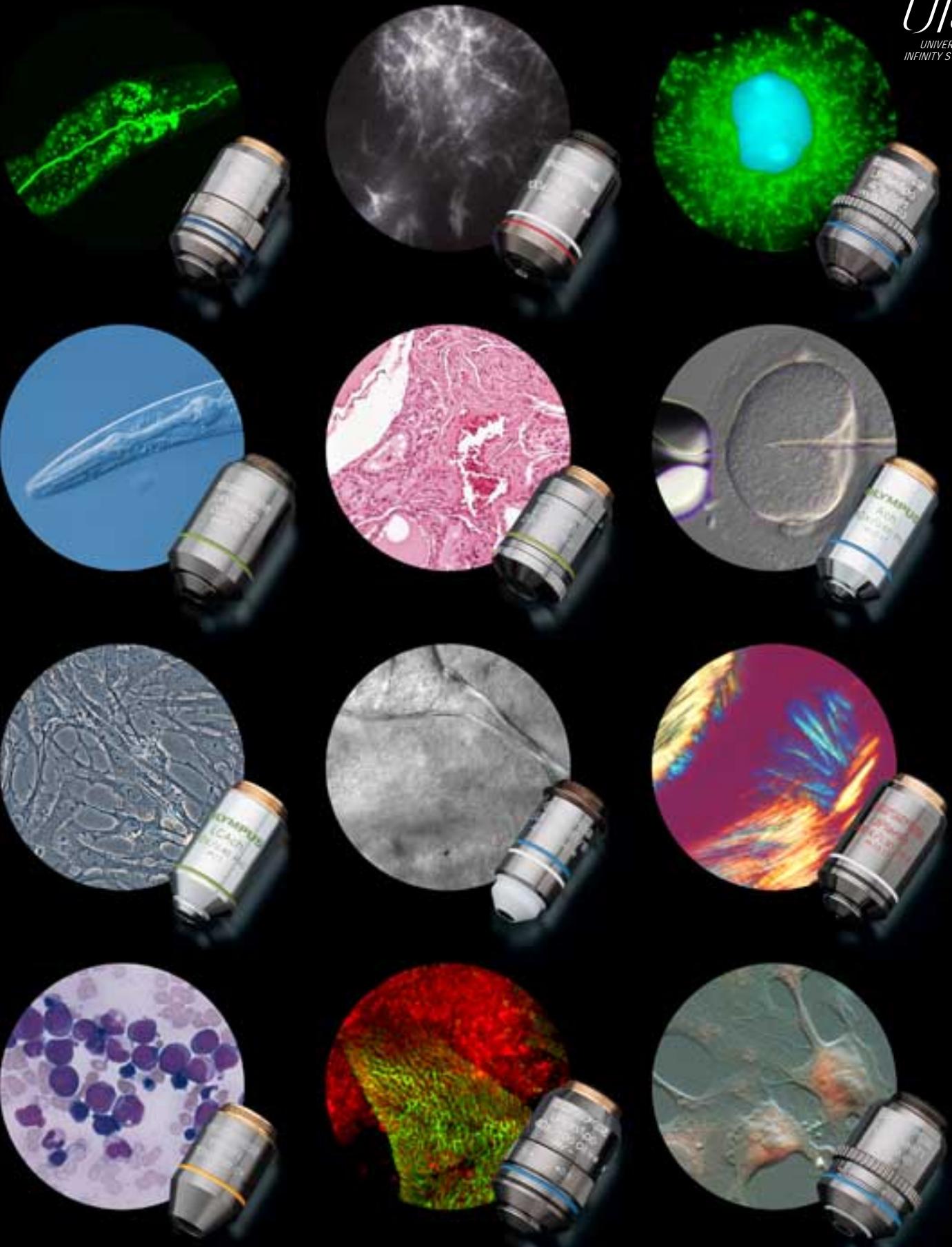


OLYMPUS[®]

UIS OBJECTIVES
FOR LIFE SCIENCE

UIS
UNIVERSAL
INFINITY SYSTEM





A wide range of top-class objectives providing unrivalled clarity and full compliance with international standards*

Already widely used in the field of bio-medicine and other areas of advanced research, modern optical microscopes must now also comply with the requirements of diversified observation methods and newly-emerging applications as well. New optical systems with new functions and capabilities have become indispensable in increasingly complex life science and medical fields that use advanced imaging devices like video, or require seamless integration with computer-based image processing technology or the introduction of laser light sources. Olympus continues to pursue the development of optical systems that meet users' needs and comply with today's stringent international standards.

Nothing exemplifies that commitment more clearly than the UIS infinity optics, now established as one of the most successful developments in this field. Chromatic aberration and field curvature are both fully compensated by the objective itself, providing consistently excellent clarity in every method of observation. The system is also valued for its versatility, enabling individual items of equipment to be flexibly combined to meet the particular demands of different needs and applications. Olympus' advanced design and meticulously accurate manufacturing technologies reflect more than 80 years of experience, culminating in a range of products which today's users acknowledge as close to ideal: the infinity-corrected optical system.

* ISO9345-1 and ISO8038.

Contents

Objectives

	UPLAPO series	3		UPLFL-P series	6
	UPLFL series	3		PL series	7
	PLAPO series	3		ACH series	7
	PLFL series	3		PL4XP	7
	APO100XOHR, PLAPO60XOTIRFM	3		ACH-P series	7
	UAPO/340 series	3		PL-PH series	7
	PLAPO-WLSM series	4		ACH-PH series	7
	APO-WLSM/UV series	4		MPLAPO series	8
	LUMPLFL-W/IR series	4		UMPLFL series	8
	UPLAPO60XW3/IR	4		CPLFL-PH, CPL-PH, LCACH-PH series	8
	UAPO-W, UPLAPO-W series	4		RC series	8
	MPL, UMPFL, LUMPLFL series	4		PLC series	8
	XLFLUOR series	5		PL-CY, PLFL-CY series	8
	XLUMPLFL20XW	5			
	LCPLFL, SLCPFL series	5			9 - 12
	LCPLFL-PH, SLCPFL-PH series	5			
	LUCPLFL40X, LUCPLFL40X-PH	5			SWH series 13
	UPLAPO-PH series	6			WH series 13
	UPLFL-PH series	6			PE 13
	PLAPO60XOPH	6			
	UPLFL-PHP, CACH-PHP, LCACH-PHP series	6			

Objective performance chart

Eyepieces, photo eyepieces

Objective features

The blue icons signify supported observation modes. Asterisks beside individual observation methods indicate that there are some limitations in usage. For details, please refer to the objective performance chart on P9 - P12.

 For brightfield observation	 For darkfield observation	 For DIC observation	 For infrared light DIC observation	 For phase-contrast observation
 For Relief Contrast observation	 For polarized light observation	 For fluorescence observation	 For fluorescence observation for UV excitation at 340nm	 For infrared light fluorescent observation
 For UV fluorescence observation	 Exclusively for LSM	 Exclusively for TIRFM	 F.N. 26.5 compatible	

Optimum performance in fluorescence or DIC observation



UPLAPO series



The UPLAPO series of Universal Plan Apochromat objectives features an unsurpassed high numerical aperture. In addition to brightfield observation, they offer perfect resolution and contrast during fluorescence, DIC and darkfield observations.



UPLFL series



Cost-effective Universal Semi-Apochromat objectives deliver superb resolution and contrast with any microscopic technique such as brightfield, fluorescence, DIC and darkfield. Olympus proprietary manufacturing technology makes possible high-precision objectives at affordable cost.

High resolution all the way to the edge of the field in brightfield observation



PLAPO series



Designed for unsurpassed resolution and contrast, these Plan Apochromat objectives keep chromatic aberration down to an absolute minimum. Precision manufacturing allows the PLAPO series to deliver maximum optical performance.



PLFL series



Despite its high magnifying power, the PLFL100X is an easy-to-use, non-oil immersion type objective. Thanks to Olympus' unique lens processing technology, this objective offers exceptional precision and cost efficiency while providing flatness in all fields of view. The PLFL 0.5X is designed for observation of specimens up to 53mm in diameter, enabling the recording and observation of such specimens as entire brain slices or small animals. It is exclusively used within the AX70 Macro system.

Ideal solutions for molecular level fluorescence observation



APO100XOHR, PLAPO60XOTIRFM



Enabling illumination of specimens with a N.A. higher than the refractive index of living cells, the APO100XOHR objective makes the observation of cells at the molecular level possible. Required use with special high refractive index cover glass and immersion oil. Capable of being used with general cover glass and immersion oil, the PLAPO60XOTIRFM has a large N.A. (1.45) and is exclusively used for TIRFM.

The optimum choice for measuring concentrations of calcium



UAPO/340 series



This objective series has enhanced transmission for UV excitation at 340nm, making them particularly effective for use with fluorescent probes such as fura-2, indo-1, and others for Calcium Ratio Imaging or intra cellular pH measurement. With their high transmission and numerical aperture, these objectives provide the maximum performance in fluorescence microscopy.

Especially effective for confocal observation



PLAPO-WLSM series



Changes in refractive index adversely affect the intensity and apparent distance during deep confocal imaging. Water immersion type objectives are recommended for observation of biological samples because the refractive index of the objective is the same as the specimen. The PLAPO40XWLSM and PLAPO60XWLSM objectives perfectly correct spherical and chromatic aberrations in the 400-750nm wavelength range.



APO-WLSM/UV series



Olympus unique UV-corrected apochromatic objective allows superior confocal imaging of UV excited fluorochromes. The objective is corrected from 350-650nm to acquire superior quality multi-channel confocal images. The infinity-corrected water immersion 40X objective brings both the UV excitation and the blue emission to the same focal point as visible light. Therefore it enables true confocal imaging throughout the field of view.

First choice for near infrared light DIC observations, enabling deep section observations of thick brain slice specimens



LUMPLFL-W/IR series



This series is suitable for research using near infrared light DIC observation to study such specimens as thick brain slices or optic nerves. Since the specimen's scattered light has only minimal effect on the observation, researchers can clearly observe deep into tissue, and make measurements using patch clamping for not only large cells but also rough neurite.



UPLAPO60XW3/IR



The UPLAPO60XW/IR water immersion objective is corrected for wavelengths from 450nm to 1,100nm. Simultaneous IR-DIC observation is obtained, with no chromatic aberration between the visible fluorescence and IR DIC images.

Down to the details: clarifying the depth of thick live specimens



UAPO-W, UPLAPO-W series



High numerical aperture, water-immersion objectives which prevent the occurrence of spherical aberrations. As a result, they produce high resolution, high contrast and aberration-free images of the interior of cultured cells, fixed specimens in aqueous media or other specimens with a refractive index similar to that of water.



MPL, UMPLFL, LUMPLFL series



This series consists of long working distance, water immersion objectives used with no cover glass. They are especially suitable for use in experiments involving manipulators. The possible insertion angle toward the objective tip is 43 degrees (40X). Despite the high resolution implied by N.A.0.8 and 3.3mm working distances, the tip shape remains extremely slender. The high access angles allow for easy electrode manipulation and attachment to the specimen. With their high transmission rate, ranging from 340nm to visible light, these objectives offer superb performance in DIC and fluorescence observations of thick specimens.

For bright fluorescence observation at low magnifications



XLFLUOR series



The XLFLUOR 2X and 4X low magnification objectives have a long working distance for maximum flexibility. The series is suitable for measuring membrane potential at the tissue level. A water immersion cap (XL-CAP) can be attached to the XLFLUOR series to eliminate disturbances caused by water ripples.

For measuring changes in membrane potential at cell level



XLUMPLFL20XW



The XLUMPLFL20XW objective, with its high 0.95 N.A., and 2.0mm of working distance allows the measurement of cell membrane electric potential. In addition, the magnification can be exchanged without any manipulation and change close to the sample. Vibration is reduced to a minimum which is of benefit for physiology and cell biology applications.

Especially suitable for live cell experiments



LCPLFL, SLCPLFL series



These Semi-Apochromat objectives are dedicated to tissue culture observations through bottles and dishes, offering excellent contrast and resolution in brightfield, DIC and fluorescence observations.



LCPLFL-PH, SLCPLFL-PH series



These objectives are exclusively designed for culture specimens. Thanks to the correction cap method, an excellent phase-contrast image is assured regardless of the thickness and material of the vessel.



LUCPLFL40X, LUCPLFL40X-PH



Accommodating vessel thicknesses from 0-2mm with a correction collar mechanism that maintains objective focus during adjustment. Correction for different vessels is fast and simple. Lens design is also optimized for 340nm transmission for Calcium Ratio Imaging.

The highest-level field of view in phase-contrast observations



UPLAPO-PH series



Objectives with the world's highest resolution and contrast for phase-contrast observation. Designed for phase contrast microscopy, these objectives also offer very good performance for brightfield and fluorescence observation.



UPLFL-PH series



Universal phase-contrast objectives that provide the same critical optical performance as the UPLFL series. The phase membrane allows a high-contrast image to be produced without using an interference filter.



PLAPO60XOPH



Specially designed for phase-contrast observation, this objective also provides excellent clarity in brightfield or fluorescence observations by optimally compensating for many different aberrations.



UPLFL-PHP, CACH-PHP, LCACH-PHP series



This series is used in combination with the pre-center type phase-contrast slider IX2-SLP. When changing the objective magnification in phase-contrast observation, no centering adjustment is necessary.

Used for transmitted polarized light observation with high contrast



UPLFL-P series



These high-class universal objectives allow transmitted light observations with high extinction and high contrast, with almost total elimination of optical aberrations. Combined with a Brace Koehler compensator, they are ideal for detecting highly sensitive polarized substances. In addition, they can perform transmitted light brightfield and DIC observations and fluorescence observations with UV excitation.

The natural choice for clinical inspections



PL series



These standard objectives are suited to clinical laboratory and examination work. They ensure superb field flatness up to F.N.22 with brightfield observation in transmitted light.



ACH series



These cost-effective standard objectives for transmitted light brightfield observation are best-suited to routine work as well as educational and training purposes.



PL4XP



These general objectives were developed for transmitted polarized light observation. Their ability to provide excellent flatness up to F.N.22 makes them very suitable for clinical inspections.



ACH-P series



Primarily used for clinical inspection and student training, these highly cost-efficient objectives enable transmitted polarized light observations and are compliant with F.N. 22.



PL-PH series



These general objectives were developed for transmitted phase-contrast light observation and are used for clinical inspections, providing consistent image flatness up to F.N.22.



ACH-PH series



This high-quality, cost-efficient series is for transmitted phase-contrast observations, and is used for clinical inspection and student training. Complies with F.N. 22.

Ideal for smear and blood observations



MPLAPO series



These no cover objectives are specially designed for microscopy without a cover glass such as for blood smear specimens.



UMPLFL series



As well as providing the functions of the MPLAPO series, these high-class universal objectives with no cover glass can also perform DIC observations.

For observing specimens in plastic containers



CPLFL-PH, CPL-PH, LCACH-PH series



Combining easy focusing with excellent cost efficiency, these high-quality phase-contrast objectives are especially suitable for routine inspections involving many specimens.



RC series



These objectives are designed for observation of living cells including oocyte. Plastic vessels applicable for Relief Contrast observations.

Especially suitable for cytological inspections



PLC series



These PLC series Plan objectives deliver a very significant improvement in image flatness: at 10X and 40X magnifications, their performance is among the very best in their class. Their Plan Achromatic optical design is more usually found in higher-class objectives, so their cost performance is particularly good.



PL-CY, PLFL-CY series



The 10X objective has a built-in ND filter, which equalizes the light intensity in the field of view when switching to the 40X objective. It is capable to scan the specimen slide to the very possible edge without the 40X objective touching the slider holder.

Objective Performance Chart

Objective	Item	Numerical Aperture	W.D. (mm)	F.N.	Cover Glass Thickness (mm)	Immersion	Spring	Correction Ring	Iris Diaphragm
Plan Apochromat	PLAPO	1.25X	0.04	5.1	26.5	—			
		2X	0.08	6.2	26.5	—			
		40X	0.95	0.13	26.5	0.11-0.23			
		60XO3	1.40	0.15	26.5	0.17	Oil Immersion		
		60XO3PH	1.40	0.15	26.5	0.17	Oil Immersion		
		60XO3TIRFM	1.45	0.15	26.5	0.17	Oil Immersion		
		100XO3	1.40	0.10	26.5	0.17	Oil Immersion		
	UPLAPO	4X	0.16	13.0	26.5	—			
		10X	0.40	3.1	26.5	0.17			
		10XO3	0.40	0.24	26.5	0.17	Oil Immersion		
		20X2	0.70	0.65	26.5	0.17			
		20XO3	0.80	0.19	26.5	—	Oil Immersion		
		40X	0.85	0.20	26.5	0.11-0.23			
		40XOI3	0.5-1.00	0.12	26.5	—	Oil Immersion		
		60X	0.90	0.20	26.5	0.11-0.23			
		100XOI3	0.5-1.35	0.10	26.5	0.17	Oil Immersion		
		10XPH	0.40	3.1	26.5	0.17			
		20XPH	0.70	0.65	26.5	0.17			
		40XOI3PH	0.50-1.00	0.12	26.5	—	Oil Immersion		
		100XOI3PH	0.50-1.35	0.10	26.5	0.17	Oil Immersion		
		10XW3	0.40	0.43	26.5	0.17	Water Immersion		
		60XW3	1.20	0.25	26.5	0.13-0.21	Water Immersion		
		60XW3/IR	1.20	0.28	26.5	0.13-0.21	Water Immersion		
		Plan Semi-Apochromat	UPLFL	4X	0.13	17.0	26.5	—	
10X	0.30			10.0	26.5	—			
20X	0.50			1.60	26.5	0.17			
40X	0.75			0.51	26.5	0.17			
60XOI3	0.65-1.25			0.10	26.5	0.17	Oil Immersion		
100XO3	1.30			0.10	26.5	0.17	Oil Immersion		
100XOI3	0.60-1.30			0.10	26.5	0.17	Oil Immersion		
4XPH	0.13			17.0	26.5	—			
10XPH	0.30			10.0	26.5	—			
20XPH	0.50			1.60	26.5	0.17			
40XPH	0.75			0.51	26.5	0.17			
60XOI3PH	0.65-1.25			0.10	26.5	0.17	Oil Immersion		
100XO3PH	1.30			0.10	26.5	0.17	Oil Immersion		
4XPHP	0.13			17.0	26.5	—			
4XP	0.13			13.0	26.5	—			
10XP	0.30			3.1	26.5	—			
20XP	0.50			1.60	26.5	0.17			
40XP	0.75			0.51	26.5	0.17			
100XO3P	1.30		0.10	26.5	0.17	Oil Immersion			
CPLFL	10XPH		0.30	9.5	22	1			
	10XRC		0.30	8.9	22	1.5			
PLFL	0.5X		0.02	7.0	26.5	—			
	10XCY		0.30	9.9	26.5	—			
	100X	0.95	0.20	26.5	0.14-0.20				
Plan Semi-Apochromat Long Working Distance	LUCPLFL	40X	0.60	3.4	22	0-2			
		40XPH	0.60	3.65	22	0-2			
		40XRC	0.60	3.3	22	0-2			
	LCPLFL	20X	0.40	6.9	22	0-2.5			
		40X	0.60	2.6	22	0-2.5			
		60X	0.70	1.7	22	0-2.5			
		20XPH	0.40	6.9	22	0-2.5			
		40XPH	0.60	2.6	22	0-2.5			
		60XPH	0.70	1.7	22	0-2.5			
		20XRC	0.40	6.7	22	0-2.5			
	SLCPLFL	40X	0.55	7.7	22	0-2.6			
		40XPH	0.55	7.7	22	0-2.6			

Objective Performance Chart

Objective	Item		Numerical Aperture	W.D. (mm)	F.N.	Cover Glass Thickness (mm)	Immersion	Spring	Correction Ring	Iris Diaphragm
Plan Achromat	PL	2X	0.05	5.0	22	—				
		4X	0.10	22.0	22	—				
		10X	0.25	10.5	22	—				
		10XCY	0.25	10.5	22	—				
		20X3	0.40	1.20	22	0.17				
		40X	0.65	0.56	22	0.17				
		50XOI	0.65-0.90	0.20	22	—	Oil Immersion			
		100XO	1.25	0.15	22	—	Oil Immersion			
		10XPH	0.25	10.5	22	—				
		20X3PH	0.40	1.20	22	0.17				
		40XPH	0.65	0.56	22	0.17				
		100XOPH	1.25	0.15	22	—	Oil Immersion			
	4XP	0.10	22.0	22	—					
	PLC	4X	0.10	22.0	22	—				
		10X	0.25	10.5	22	—				
40X		0.65	0.56	22	0.17					
100XO		1.25	0.13	22	—	Oil Immersion				
CPL	10XPH	0.25	9.8	22	—					
	10XRC	0.25	9.5	22	1.5					
Achromat	ACH	10X	0.25	6.1	22	—				
		20X	0.40	3.0	22	0.17				
		40X	0.65	0.45	22	0.17				
		60X	0.80	0.15	22	0.17				
		100XO	1.25	0.13	22	—	Oil Immersion			
		100XOI	0.60-1.25	0.13	22	—	Oil Immersion			
		10XPH	0.25	6.1	22	—				
		20XPH	0.40	3.0	22	0.17				
		40XPH	0.65	0.45	22	0.17				
		100XOPH	1.25	0.13	22	—	Oil Immersion			
		10XP	0.25	6.1	22	—				
		20XP	0.40	3.0	22	0.17				
	40XP	0.65	0.45	22	0.17					
	100XOP	1.25	0.13	22	—	Oil Immersion				
CACH	10XPHP	0.25	8.8	22	1					
Achromat Long Working Distance	LCACH	20XPH	0.40	3.2	22	1				
		40X2PH	0.55	2.2	22	1				
		20XPHP	0.40	3.2	22	1				
		40XPHP	0.55	2.2	22	1				
		20XRC	0.40	2.8	22	1.5				
		40XRC	0.55	1.9	22	1.5				
Water Immersion Long Working Distance	UMPLFL	10XW	0.30	3.3	26.5	—	Water Immersion			
		20XW	0.50	3.3	26.5	0	Water Immersion			
	LUMPLFL	40XW	0.80	3.3	26.5	0	Water Immersion			
		40XW/IR2	0.80	3.4	26.5	0	Water Immersion			
		60XW	0.90	2.0	26.5	0	Water Immersion			
		60XW/IR	0.90	2.0	26.5	0	Water Immersion			
		100XW	1.00	1.5	26.5	0	Water Immersion			
For UV	UAPO	20X3/340	0.75	0.55	22	0.17				
		40X3/340	0.90	0.20	22	0.11-0.23				
		40XOI3/340	0.65-1.35	0.10	22	0.17	Oil Immersion			
		20XW3/340	0.70	0.40	22	0.17	Water Immersion			
		40XW3/340	1.15	0.25	22	0.13-0.25	Water Immersion			
Others	APO	20XWLSM/UV	0.40	0.14	10	0.17	Water Immersion			
		40XWLSM/UV	0.90	0.12	10	0.17	Water Immersion			
		100XOHR	1.65	0.1	22	0.15	Oil Immersion			
	XLFLUOR	2X/340	0.14	21.0	22	0-5(Water)				
		4X/340	0.28	29.5	22	0-5(Water)				
	XLUMPLFL	20XW	0.95	2.0	22	0	Water Immersion			
	PLAPO	40XWLSM	0.90	0.16	22	0.17	Water Immersion			
60XWLSM		1.00	0.15	22	0.17	Water Immersion				
60XQLSM		1.10	0.13	22	0.17	Oil Immersion				

Waterproof, Oil proof	Correction Cap	Brightfield	Darkfield	DIC	Phase- Contrast	Relief Contrast	Polarized Light	Fluorescence (B, G Excitation)	UV Fluorescence (at 360nm)	Remarks
			x	x	x	x			x	
			x	x	x	x			x	
				x	x	x			x	
				x	x	x			x	ND Filter Incorporated (For Cytological Inspection)
				x	x	x			x	
				x	x	x			x	
			x	x	x	x			x	
				x		x			x	
				x		x			x	
			x	x		x			x	
			x	x	x	x			x	For Polarized Light Observation
			x	x	x	x			x	
				x	x	x			x	
				x	x	x			x	
			x	x	x	x			x	
				x	x	x			x	
				x	x	x			x	
			x	x	x	x			x	
				x		x			x	Plastic Chamber
				x	x				x	Plastic Chamber + Warm Plastic
				x	x	x			x	
				x	x	x			x	
				x	x	x			x	
			x	x	x	x			x	
				x	x	x			x	
				x	x	x			x	
			x	x		x			x	
				x	x	x			x	For Polarized Light Observation
				x	x	x			x	
			x	x	x	x			x	
				x		x			x	Plastic Chamber
				x		x			x	Plastic Chamber
				x		x			x	Plastic Chamber
				x	x				x	Plastic Chamber + Warm Plastic
				x	x				x	
					x	x				
					x	x				
					x	x				
					x	x				
				x	x	x				
				x	x	x				
				x	x	x				
				x	x	x				
				x	x	x				
				x	x	x				
			x	x	x	x			x	Ultra Hight N.A.
			x	x	x	x				W.D. Includes 5mm Water
					x	x				
					x	x			x	For CLSM
					x	x			x	For CLSM
				x	x	x			x	For CLSM

■ Eyepieces and photo eyepieces which broaden the observation range



Eyepiece/ SWH

As well as offering all the features of the WH eyepiece, this model offers an ultra wide field of view (F.N. 26.5) — improving operability and making inspections more efficient.



Eyepiece/ WH

This eyepiece provides outstanding flatness and fully compensates for different types of aberrations by itself, maximizing the performance of UIS objectives in all field-of-view areas.



Photo eyepiece/ PE2X, 2.5X, 3.3X, 4X, 5X

These specially developed photo eyepieces faithfully reproduce the UIS objective performance and minimize image distortion for photomicrography and video recording.

Eyepiece specifications

Model	Name	F.N.	Diopter	Micrometer diameter (mm)	Micrometer thickness (mm)
Widefield	WH10X	22	—	24	1.4mm — 1.6mm
	WH10X-H	22	-8 — +2	24	1.4mm — 1.6mm
	WH15X	14	—	24	1.4mm — 1.6mm
	WHB10X	20	—	20.4	1.0mm — 1.6mm
	WHB10X-H	20	-5 — +5	20.4	1.0mm — 1.6mm
	CROSSWH10X	22	-8 — +2	—	—
Super widefield	SWH10X-H	26.5	-8 — +2	—	—
	MICROSSWH10X	26.5	-8 — +2	—	—
	CROSSSWH10X	26.5	-8 — +2	—	—
Finder eyepiece	35WH10X	22	-8 — +2	—	—
	35SWH10X	26.5	-8 — +2	—	—
	PWH10X	22	-8 — +2	—	—
	PSWH10X	26.5	-8 — +2	—	—

■ Olympus UIS objectives: maximizing optical performance while complying with international standards

Objective features



As a world leader in microscope manufacturing, Olympus is committed to continuous improvement in optical performance, featuring design characteristics that meet or exceed the accepted international standards of both today and tomorrow. By increasing image clarity, we aim to support researchers everywhere, helping to advance the ease and scope of their undertakings. At the same time, careful compliance with world standards helps to ensure that ever larger numbers of researchers can benefit from the quality and value of high-performance Olympus objectives.

In pursuit of these aims, we introduce our UIS infinity objectives with both pride and confidence.



Specifications are subject to change without any obligation on the part of the manufacturer.

OLYMPUS[®]

OLYMPUS OPTICAL CO.,LTD.
 San-Ei building, 22-2, Nishi Shinjuku 1-chome, Shinjuku-ku, Tokyo, Japan
OLYMPUS OPTICAL CO. (EUROPA) GMBH.
 Postfach 10 49 08, 20034, Hamburg, Germany
OLYMPUS AMERICA INC.
 2 Corporate Center Drive, Melville, NY 11747-3157, U.S.A.
OLYMPUS SINGAPORE PTE LTD.
 491B River Valley Road, #12-01/04 Valley Point Office Tower, Singapore 248373
OLYMPUS OPTICAL CO. (U.K.) LTD.
 2-8 Honduras Street, London EC1Y 0TX, United Kingdom.
OLYMPUS AUSTRALIA PTY. LTD.
 104 Ferntree Gully Road, Oakleigh, Victoria, 3166, Australia
OLYMPUS LATIN AMERICA, INC.
 6100 Blue Lagoon Drive, Suite 390 Miami, FL 33126-2087, U.S.A.

OLYMPUS BUSINESS AREAS



www.olympus.com