

Objectives ■



 **OptoSigma®**

Type	Magnification	Part Number	Description	NA	WD
Visible Normal type	2x	PAL-2-B	MplanApo 2×	0.055	34
	5x	PAL-5	MplanApo 5×	0.14	41
	10x	PAL-10-A	MplanApo 10×	0.3	34
Visible Super long type	20x	PAL-20-L-A	MplanApo SL 20×	0.3	31.1
	50x	PAL-50-L-A	MplanApo SL 50×	0.42	20.7
	100x	PAL-100-L	MplanApo SL 100×	0.53	12.1
UV(266 532) Normal type Air gap	10x	PFL-10-UV-AG	Mplan UV 10×	0.2	13.5
	20x	PFL-20-UV-AG-A	Mplan UV 20×	0.36	15.07
	50x	PFL-50-UV-AG-A	Mplan UV 50×	0.42	12
	80x	PFL-80-UV-AG-LC00	Mplan UV 80×	0.55	10
UV(266 532) Glass Thickness Compensation (t0.7)Type Air gap	20x	PFL-20-UV-AG-LC07-A	LCD Mplan UV 20× (t0.7)	0.36	15.15(Air)
	50x	PFL-50-UV-AG-LC07-A	LCD Mplan UV 50× (t0.7)	0.42	11.99(Air)
	80x	PFL-80-UV-AG-LC07	LCD Mplan UV 80× (t0.7)	0.55	9.78(Air)
UV(266 532) Glass Thickness Compensation (t1.1)Type Air gap	20x	PFL-20-UV-AG-LC11-A	LCD Mplan UV 20× (t1.1)	0.36	15.2(Air)
	50x	PFL-50-UV-AG-LC11-A	LCD Mplan UV 50× (t1.1)	0.42	12.02(Air)
	80x	PFL-80-UV-AG-LC11	LCD Mplan UV 80× (t1.1)	0.55	9.65(Air)
NUV(355 532) Normal type	20x	PAL-20-NUV-A	Mplan NUV 20×	0.4	17.25
	50x	PAL-50-NUV-A	Mplan NUV 50×	0.45	15.1
	100x	PAL-100-NUV-A	Mplan NUV 100×	0.57	11.23
NUV(355 532) HR type	50x	PAL-50-NUV-HR-L	Mplan NUV HR 50×	0.65	10
	100x	PAL-100-NUV-HR	Mplan NUV HR 100×	0.7	10
NUV(355 532) Glass Thickness Compensation (t0.7)Type	20x	PAL-20-NUV-LC07-A	LCD Mplan NUV 20× (t 0.7)	0.4	17.35(Air)
	50x	PAL-50-NUV-LC07-A	LCD Mplan NUV 50× (t 0.7)	0.45	15.05(Air)
	100x	PAL-100-NUV-LC07-A	LCD Mplan NUV 100× (t 0.7)	0.57	11.17(Air)
NUV(355 532) Glass Thickness Compensation (t1.1)Type	20x	PAL-20-NUV-LC11-A	LCD Mplan NUV 20× (t 1.1)	0.4	17.4(Air)
	50x	PAL-50-NUV-LC11-A	LCD Mplan NUV 50× (t 1.1)	0.45	15.01(Air)
	100x	PAL-100-NUV-LC11-A	LCD Mplan NUV 100× (t 1.1)	0.57	11.13(Air)
NUV(355 532) HR Glass Thickness Compensation (t0.7)Type	50x	PAL-50-NUV-HR-L-LC07-A	LCD Mplan NUV HR 50× (t 0.7)	0.65	9.91(Air)
NUV(355 532) HR Glass Thickness Compensation (t1.1)Type	50x	PAL-50-NUV-HR-L-LC11-A	LCD Mplan NUV HR 50× (t 1.1)	0.65	9.89(Air)
NIR(1064 532) Normal type	10x	PAL-10-NIR	Mplan NIR 10×	0.3	31
	20x	PAL-20-NIR-LC00	Mplan NIR 20×	0.4	20.2
	50x	PAL-50-NIR-L	Mplan NIR 50×	0.45	15.1
NIR(1064 532) HR type	20x	PAL-20-NIR-HR-LC00	Mplan NIR HR 20×	0.45	20
	50x	PAL-50-NIR-HR-LC00	Mplan NIR HR 50×	0.67	10
NIR(1064 532) Glass Thickness Compensation (t0.7)Type	20x	PAL-20-NIR-LC07	LCD Mplan NIR 50× (t0.7)	0.4	19.98(Air)
	50x	PAL-50-NIR-L-LC07	LCD Mplan NIR 20× (t0.7)	0.45	15.01(Air)
NIR(1064 532) Glass Thickness Compensation (t0.7)Type	20x	PAL-20-NIR-LC11	LCD Mplan NIR 50× (t1.1)	0.4	19.85(Air)
	50x	PAL-50-NIR-L-LC11	LCD Mplan NIR 20× (t1.1)	0.45	14.97(Air)
NIR(1064 532) HR Glass Thickness Compensation (t0.7)Type	50x	PAL-50-NIR-HR-LC07	LCD Mplan NIR HR 50× (t0.7)	0.67	10.48(Air)
UV/NUV(266 355 532) Normal type Air gap	10x	PFL-10-UV/NUV-AG	Mplan UV/NUV 10	0.2	13.5
	20x	PFL-20-UV/NUV-AG-A	Mplan UV/NUV 20	0.36	15.07
	50x	PFL-50-UV/NUV-AG-A	Mplan UV/NUV 50	0.42	12
Femtosecond NIR (780) Glass Thickness Compensation (t0.7)Type	20x	PAL-20-NIR(780)-LC07	LCD MplanApo NIR(780) 20×(780)	0.45	17.2(Air)
	50x	PAL-50-NIR(780)-LC07	LCD MplanApo NIR(780) 50×(780)	0.8	3.8(Air)

Classification of objective lenses

Parfocal distance / Screw size	Corresponding wavelength	Glass thickness compensation	Product Name Part Number	Main purpose of use
45mm Φ20.32×0.706	Visible	None	Bright field long working Objective Lenses EPL / EPLE	Visual observation
95mm Φ26×0.706	Visible	None	Bright field long working objective Lenses PAL / PAL-L	Visual observation
	Visible / Near ultra-violet	None/0.7mm /1.1mm	Bright field near ultra-violet objective Lenses PAL-NUV	Visual/Near ultra-violet observation Laser processing
	Visible / Near-infrared	None/0.7mm /1.1mm	Bright field near-infrared objective Lenses PAL-NIR	Visual/ Near-infrared observation Laser processing
	Visible / Ultra-violet	None/0.7mm /1.1mm	Bright field ultra-violet objective Lenses PFL-UV-AG	Visual/ultra-violet observation Laser processing

※ Objectives with glass thickness compensation adjustable ring is also available. Please contact us.

Part number description

PAL-50-NIR- - -LC00-A

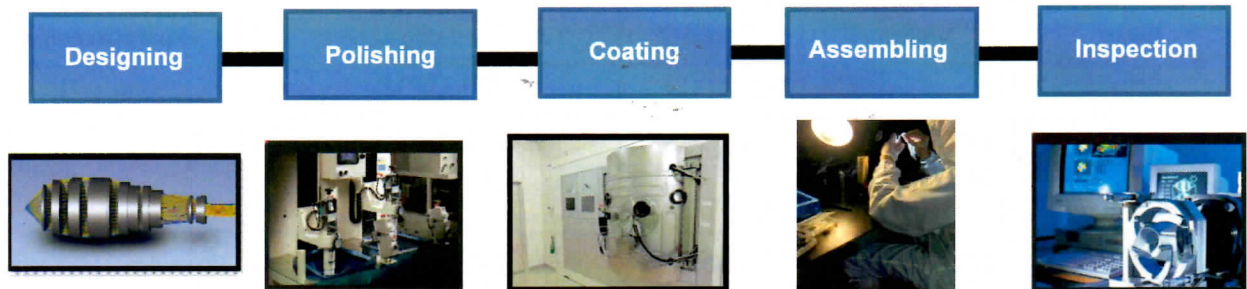
① ② ③ ④ ⑤⑥ ⑦ ⑧

① Lens type	PAL: Plan apochromat PFL: Plan semi-apochromat (Plan Fluor)	⑤ Working distance	L --> Long working distance
② Magnification	The magnification of the objective lenses	⑥ AG	Air gap type (Only to the UV type)
③ Wavelength	None --> Visible range NIR --> Near-infrared NUV --> Near ultra-violet UV --> Ultra-violet	⑦ Glass thickness	LC00 --> Glass thickness is not corrected LC07 --> Glass thickness is corrected to t=0.7mm LC11 --> Glass thickness is corrected to t=1.1mm
④ Resolution	None --> Normal resolution HR --> High resolution	⑧ Ver. Information	A~ Last updated ver.

*Blanks are omitted and left-justified
exp.) PAL-50-NIR-LC00

Reliable integrated in-house production systems

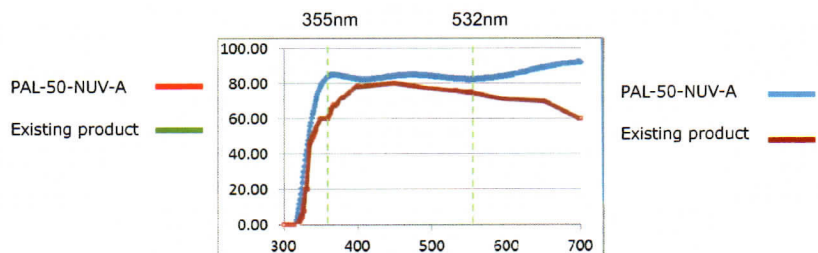
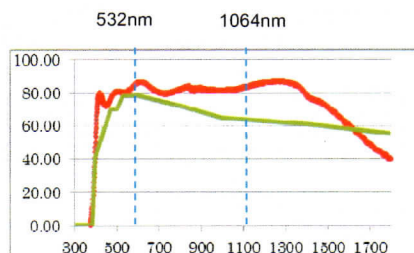
We are operating an integrated in-house production system from planning, designing, manufacturing and to assembly. This one-stop production system contributes a lot about higher quality and shorter production time of our products as well as quality assurance and capability to deal with any technical issues.



We are doing transmitted wave front inspection for all of the objectives when assembling. Totally eliminating the production error of each part and assembly errors, we are maintaining continual high quality of our products.

Higher overall transmittance

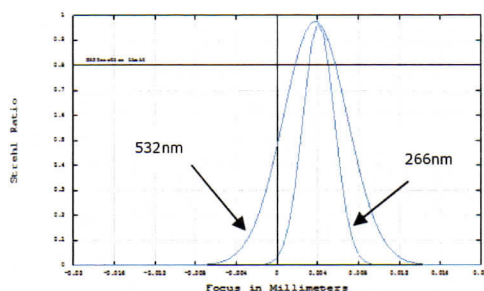
Our objective lenses for laser processing realize high transmittance by providing our original anti-reflection coating to the processing laser wavelength band. It will be a great benefit of increasing throughput of the processing laser because of the lower absorption of the beam inside the objective lenses.



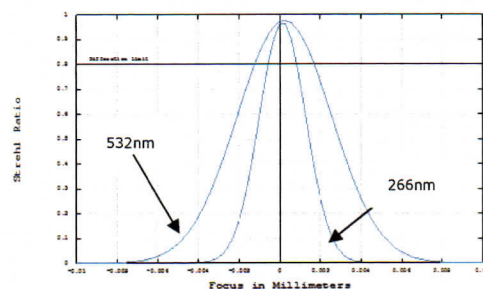
The ideal design of minimizing aberrations between the focal point of processing laser and the focal plane of visible observation.

The visible wavelength band designed to be coincided with the focal point of the processing laser. Due to this design, it will well suit for an application that combines observation with laser processing, inspection, and measurement. It is also suited for the combination use with an autofocus system.

PAL-20-UV-AG-A



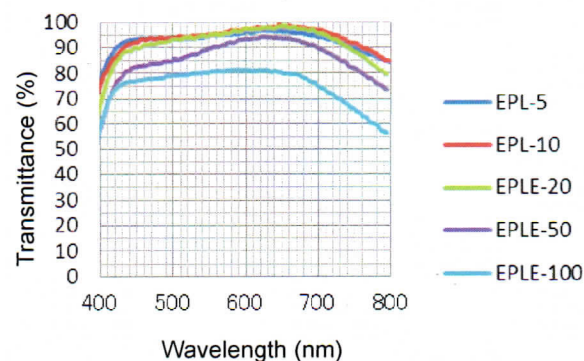
PAL-50-UV-AG-A



Long Working Distance Objective Lenses (EPL / EPLE)

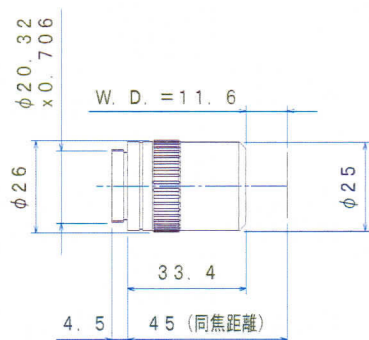


- Bright Field Inspection
- Infinity Corrected
- Plan Apochromat
- Well work with an Auto-Focusing system due to compact and lightweight design.

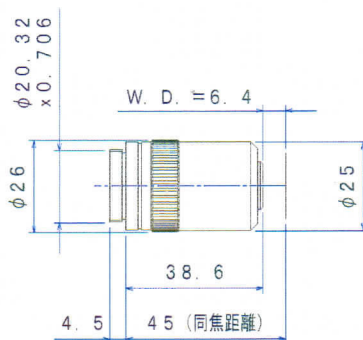


Outline Drawings

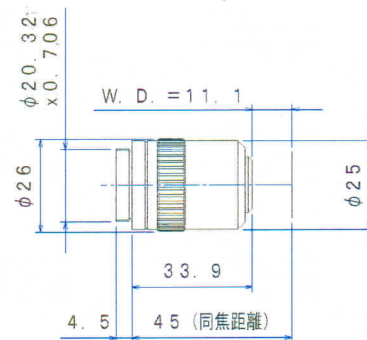
EPL-5



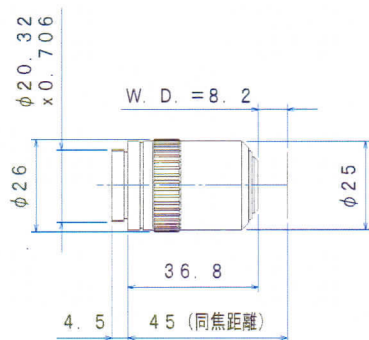
EPL-10



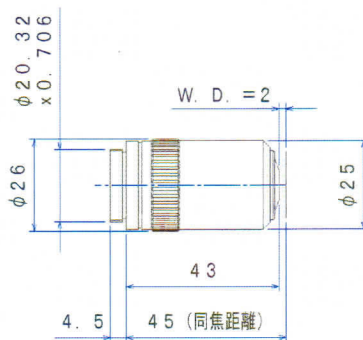
EPL-20



EPL-50



EPL-100



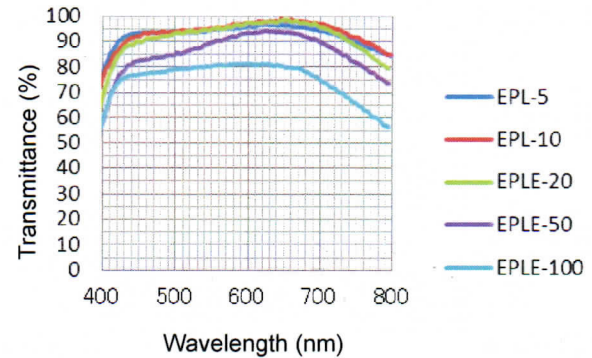
Part Number	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
							(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
EPL-5	5×	40	0.13	11.6	2.1	16.3	φ4.8	0.96×1.28	0.085
EPL-10	10×	20	0.3	6.4	0.9	3.1	φ2.4	0.48×0.64	0.085
EPL-20	20×	10	0.4	11.1	0.7	1.7	φ1.2	0.24×0.32	0.085
EPL-50	50×	4	0.55	8.2	0.5	0.9	φ0.48	0.10×0.13	0.095
EPL-100	100×	2	0.8	2	0.3	0.4	φ0.24	0.05×0.06	0.105

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Long Working Distance Objective Lenses (EPL / EPLE)

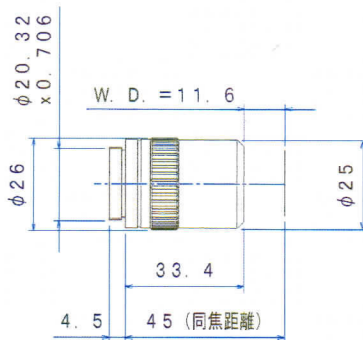


- Bright Field Inspection
- Infinity Corrected
- Plan Apochromat
- Well work with an Auto-Focusing system due to compact and lightweight design.

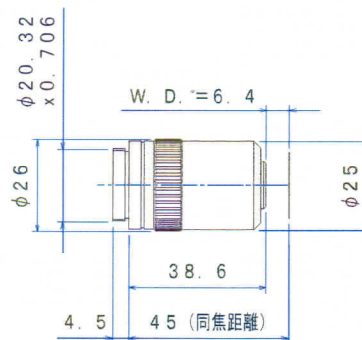


Outline Drawings

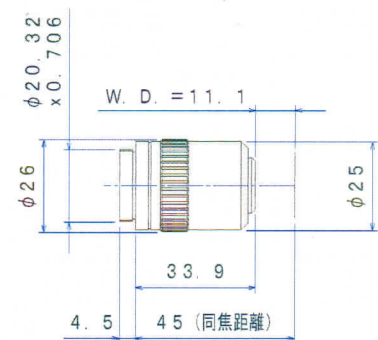
EPL-5



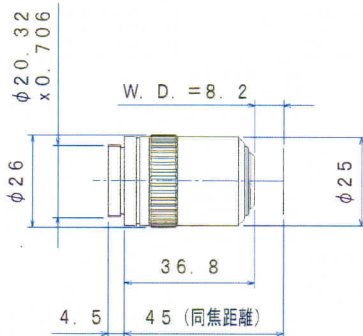
EPL-10



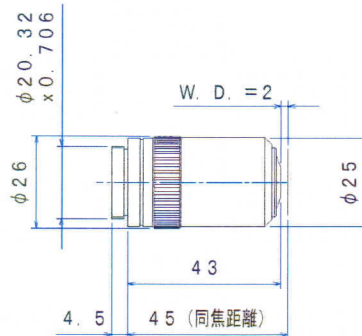
EPL-20



EPL-50



EPL-100



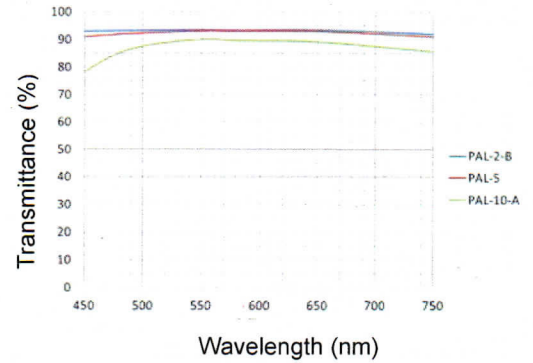
Part Number	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
							(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
EPL-5	5×	40	0.13	11.6	2.1	16.3	φ4.8	0.96×1.28	0.085
EPL-10	10×	20	0.3	6.4	0.9	3.1	φ2.4	0.48×0.64	0.085
EPL-20	20×	10	0.4	11.1	0.7	1.7	φ1.2	0.24×0.32	0.085
EPL-50	50×	4	0.55	8.2	0.5	0.9	φ0.48	0.10×0.13	0.095
EPL-100	100×	2	0.8	2	0.3	0.4	φ0.24	0.05×0.06	0.105

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Long Work Distance Objective Lenses (PAL)

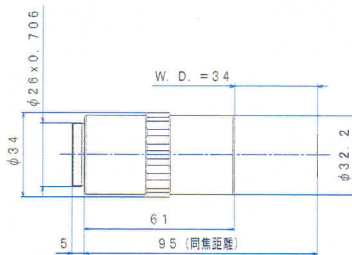


- Bright Field Inspection
- Infinity Corrected
- Plan Apochromat

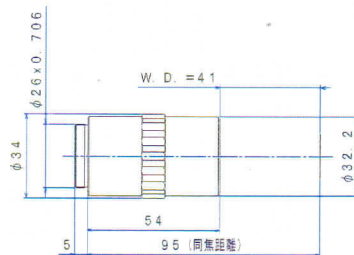


Outline Drawings

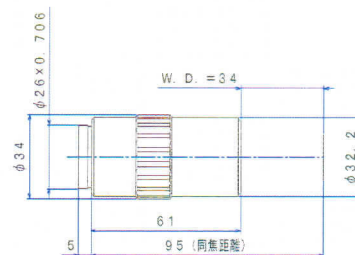
PAL-2-B



PAL-5



PAL-10-A



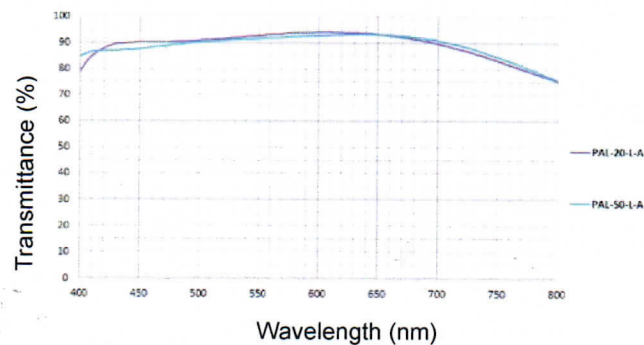
Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution n [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PAL-2-B	MPlanApo 2x	2×	100	0.055	34	5	91	φ12	2.4×3.2	0.25
PAL-5	MPlanApo 5x	5×	40	0.14	41	2	14	φ4.8	0.96×1.28	0.24
PAL-10-A	MPlanApo 10x	10×	20	0.3	34	0.92	3.1	φ2.4	0.48×0.64	0.24

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Long Work Distance Objective Lenses (PAL-L)

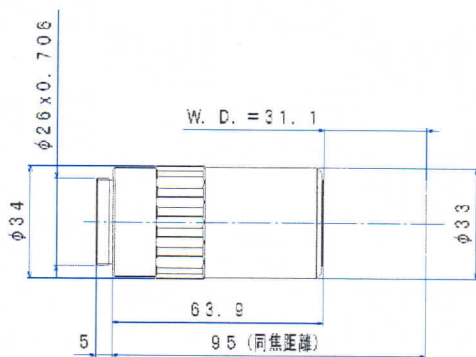


- Bright Field Inspection
- Infinity Corrected
- Plan Apochromat

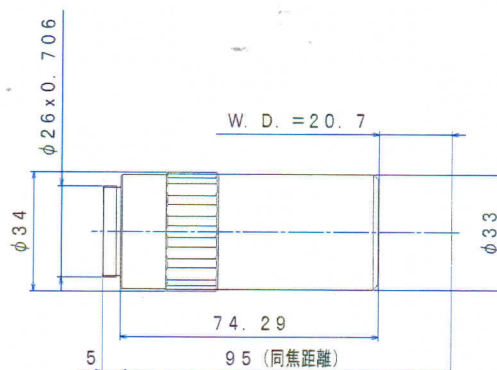


Outline Drawings

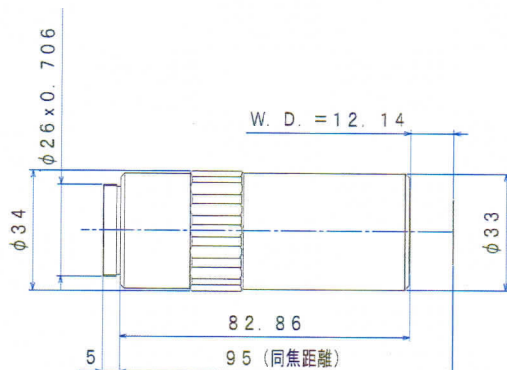
PAL-20-L-A



PAL-50-L-A



PAL-100-L



Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PAL-20-L-A	MPlanApo SL20x	20×	10	0.3	31.1	0.92	3.1	φ1.2	0.24×0.32	0.28
PAL-50-L-A	MPlanApo SL 50x	50×	4	0.42	20.7	0.65	1.6	φ0.48	0.10×0.13	0.28
PAL-100-L	MPlanApo SL 100x	50×	2	0.53	12.1	0.52	0.98	φ0.24	0.05×0.06	0.34

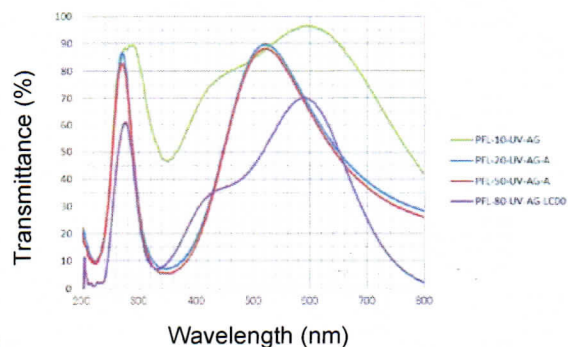
※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Ultra-violet Objective Lenses (PFL-UV-AG)



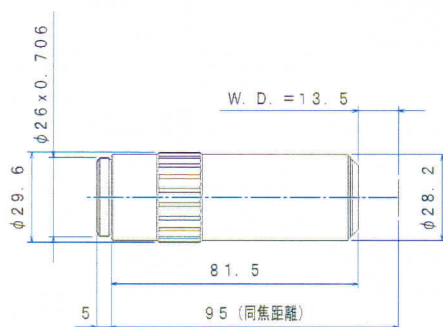
- Bright Field Inspection and Laser processing
- Infinity Corrected
- 266nm and 532nm
- Higher Laser damage threshold with Air-gap design.
- Laser damage threshold (※)

0.09 J/cm² (266nm) / 0.2 J/cm² (532nm)
 ※Pulse width:10ns, Frequency:20Hz, reference value

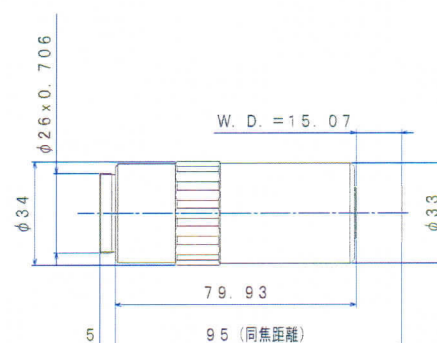


Outline Drawings

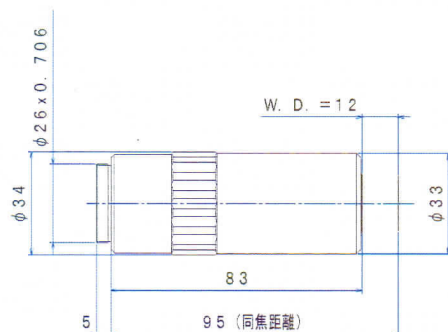
PFL-10-UV-AG



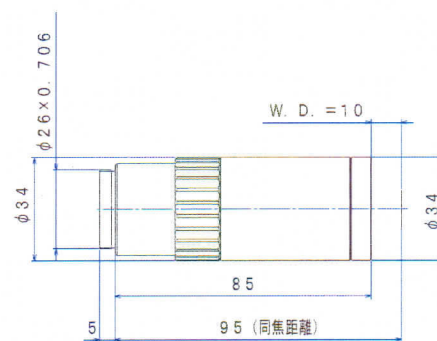
PFL-20-UV-AG-A



PFL-50-UV-AG-A



PFL-80-UV-AG-LC00



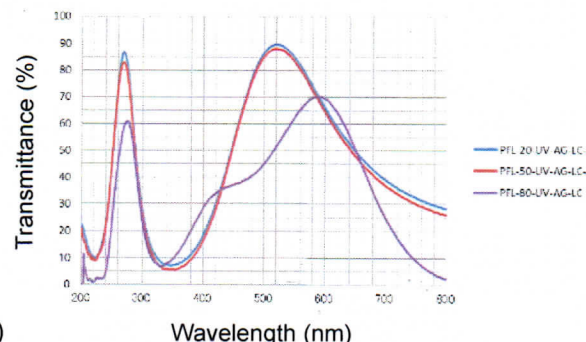
Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F. [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PFL-10-UV-AG	MPlan UV 10x	10×	20	0.2	13.5	1.4	6.9	φ2.4	0.48×0.64	0.3
PFL-20-UV-AG-A	MPlan UV 20x	20×	10	0.36	15.07	0.76	2.1	φ1.2	0.24×0.32	0.35
PFL-50-UV-AG-A	MPlan UV 50x	50×	4	0.42	12	0.65	1.6	φ0.48	0.10×0.13	0.41
PFL-80-UV-AG-LC00	MPlan UV 80x	80×	2.5	0.55	10	0.5	0.9	φ0.3	0.06×0.08	0.35

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Ultra-violet Objective Lenses with Cover Glass thickness compensation (PFL-UV-AG-LC)

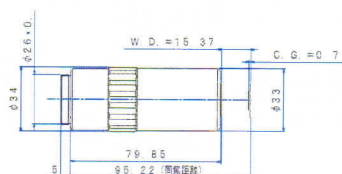


- Bright Field Inspection and Laser processing
- Infinity Corrected
- 266nm and 532nm
- Cover glass thickness compensation ($t=0.7\text{mm}$ and 1.1mm)
- Higher Laser damage threshold with Air-gap design
- Laser damage threshold (※)
 0.09 J/cm^2 (266nm) , 0.2 J/cm^2 (532nm)
 ※Pulse width:10ns, Frequency:20Hz , reference value

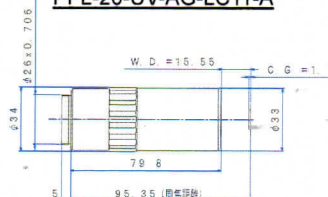


Outline Drawings

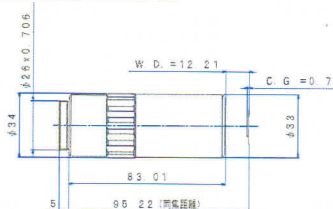
PFL-20-UV-AG-LC07-A



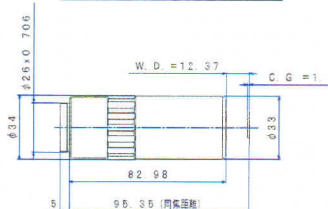
PFL-20-UV-AG-LC11-A



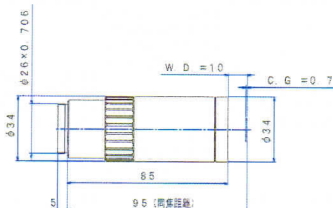
PFL-50-UV-AG-LC07-A



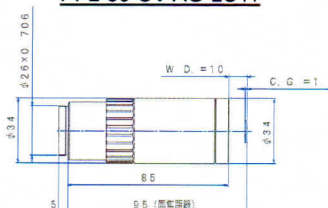
PFL-50-UV-AG-LC11-A



PFL-80-UV-AG-LC07



PFL-80-UV-AG-LC11



Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth $\pm D.F$ [μm]	Real field of View		Weight [kg]
								(Eyepiece $\phi 24\text{mm}$) [mm]	(1/2" CCD) [mm]	
PFL-20-UV-AG-LC07-A	LCD MPlan UV 20x(t0.7)	20×	10	0.36	15.15	0.76	2.1	$\phi 1.2$	0.24×0.32	0.35
PFL-20-UV-AG-LC11-A	LCD MPlan UV 20x(t1.1)	20×	10	0.36	15.2	0.76	2.1	$\phi 1.2$	0.24×0.32	0.35
PFL-50-UV-AG-LC07-A	LCD MPlan UV 50x(t0.7)	50×	4	0.42	11.99	0.65	1.6	$\phi 0.48$	0.10×0.13	0.4
PFL-50-UV-AG-LC11-A	LCD MPlan UV 50x(t1.1)	50×	4	0.42	12.02	0.65	1.6	$\phi 0.48$	0.10×0.13	0.4
PFL-80-UV-AG-LC07	LCD MPlan UV 80x(t0.7)	80×	2.5	0.55	9.78	0.5	0.9	$\phi 0.3$	0.06×0.08	0.35
PFL-80-UV-AG-LC11	LCD MPlan UV 80x(t1.1)	80×	2.5	0.55	9.65	0.5	0.9	$\phi 0.3$	0.06×0.08	0.35

※Resolution and focal depth are calculated value at wavelength of $0.55\mu\text{m}$.

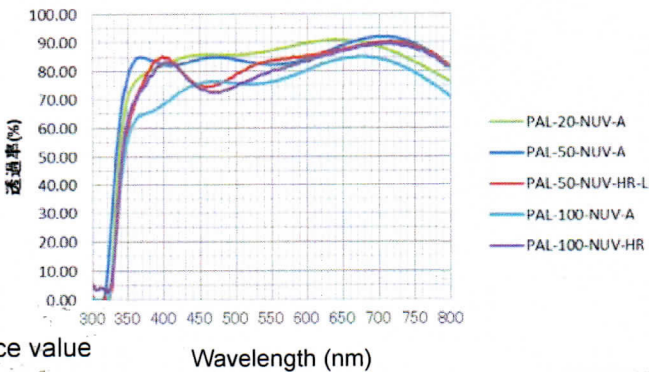
※Working distance: value at air

Near Ultra-violet Objective Lenses (PAL-NUV)

● Bright Field Inspection and

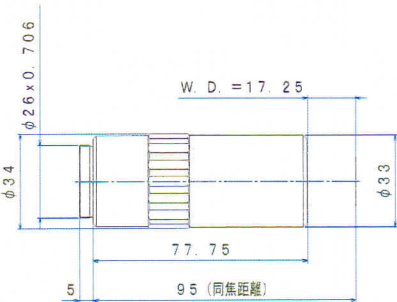


- Laser process:
- Infinity Corrected
 - Near UV (355nm)
 - Plan Apochromatic
- Laser damage threshold (×)
0.05 J/cm² (55nm)
0.1 J/cm² (2nm)

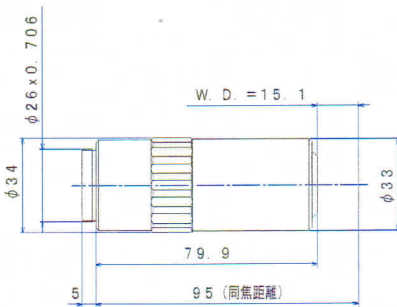


Outline Drawing

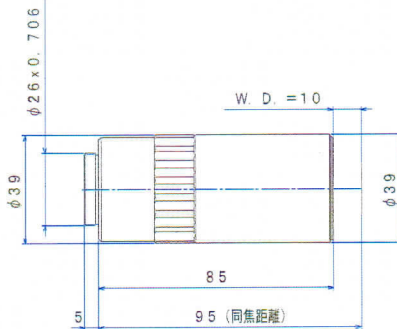
PAL-20-NUV-A



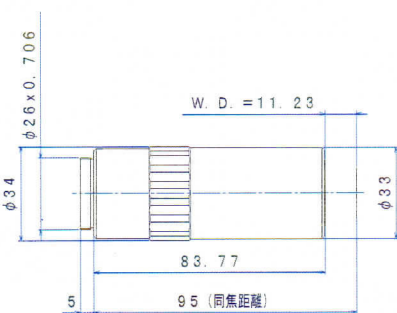
PAL-50-NUV-A



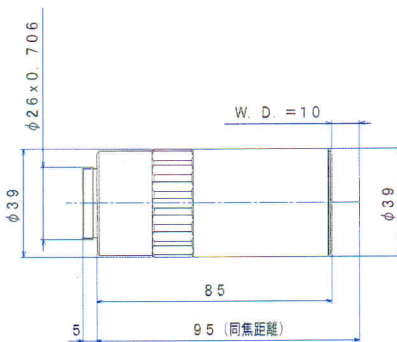
PAL-50-NUV-HR-L



PAL-100-NUV-A



PAL-100-NUV-HR



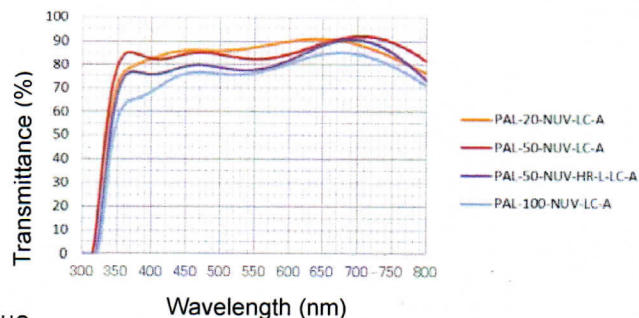
Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PAL-20-NUV-A	MPlanApo NUV 20x	20×	10	0.4	17.25	0.69	1.7	φ1.2	0.24×0.32	0.35
PAL-50-NUV-A	MPlanApo NUV 50x	50×	4	0.45	15.1	0.61	1.4	φ0.48	0.10×0.13	0.36
PAL-50-NUV-HR-L	MPlanApo NUV HR 50x	50×	4	0.65	10	0.42	0.65	φ0.48	0.10×0.13	0.51
PAL-100-NUV-A	MPlanApo NUV 100x	100×	2	0.57	11.23	0.48	0.8	φ0.24	0.05×0.06	0.38
PAL-100-NUV-HR	MPlanApo NUV HR 100x	100×	2	0.7	10	0.39	0.6	φ0.24	0.05×0.06	0.53

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Ultra-violet Objective Lenses with Cover Glass thickness compensation (PAL-NUV-LC)

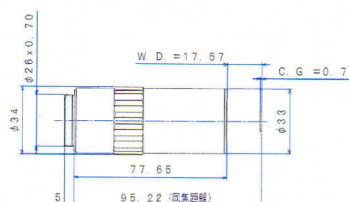


- Bright Field Inspection and Laser processing
- Infinity Corrected
- Near UV (355nm)
- Cover glass thickness compensation (t=0.7mm and 1.1mm)
- Plan Apochromat
- Laser damage threshold (※)
0.05 J/cm² (355nm) , 0.1 J/cm² (532nm)
※Pulse width:10ns, Frequency:20Hz , reference value

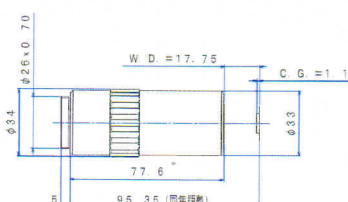


Outline Drawing

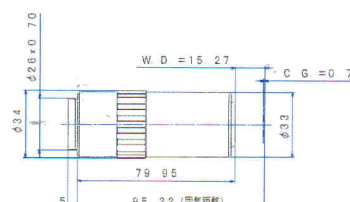
PAL-20-NUV-LC07-A



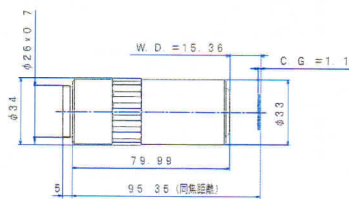
PAL-20-NUV-LC11-A



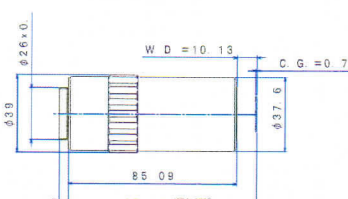
PAL-50-NUV-LC07-A



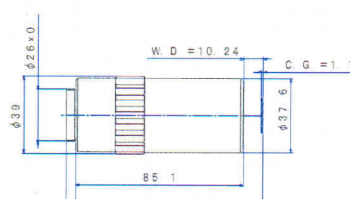
PAL-50-NUV-LC11-A



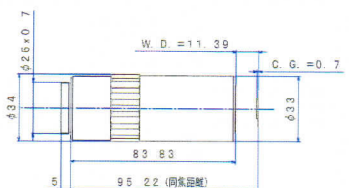
PAL-50-NUV-HR-L-LC07-A



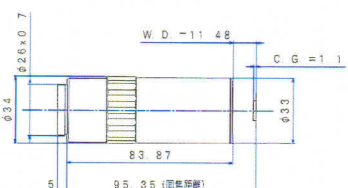
PAL-50-NUV-HR-L-LC11-A



PAL-100-NUV-LC07-A



PAL-100-NUV-LC11-A



Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PAL-20-NUV-LC07-A	LCD MPlanApo NUV 20x (t0.7)	20x	10	0.4	17.35	0.69	1.7	φ1.2	0.24x0.32	0.35
PAL-20-NUV-LC11-A	LCD MPlanApo NUV 20x (t1.1)	20x	10	0.4	17.4	0.69	1.7	φ1.2	0.24x0.32	0.35
PAL-50-NUV-LC07-A	LCD MPlanApo NUV 50x (t0.7)	50x	4	0.45	15.05	0.61	1.4	φ0.48	0.10x0.13	0.36
PAL-50-NUV-LC11-A	LCD MPlanApo NUV 50x (t1.1)	50x	4	0.45	15.01	0.61	1.4	φ0.48	0.10x0.13	0.36
PAL-50-NUV-HR-L-LC07-A	LCD MPlanApo NUV HR 50x (t0.7)	50x	4	0.65	9.91	0.42	0.7	φ0.48	0.10x0.13	0.51
PAL-50-NUV-HR-L-LC11-A	LCD MPlanApo NUV HR 50x (t1.1)	50x	4	0.65	9.89	0.42	0.7	φ0.48	0.10x0.13	0.51
PAL-100-NUV-LC07-A	LCD MPlanApo NUV 100x (t0.7)	100X	2	0.57	11.17	0.48	0.8	φ0.24	0.05x0.06	0.39
PAL-100-NUV-LC11-A	LCD MPlanApo NUV 100x (t1.1)	100X	2	0.57	11.13	0.48	0.8	φ0.24	0.05x0.06	0.39

※Resolution and focal depth are calculated value at wavelength of 0.55μm. ※Working distance: value at air

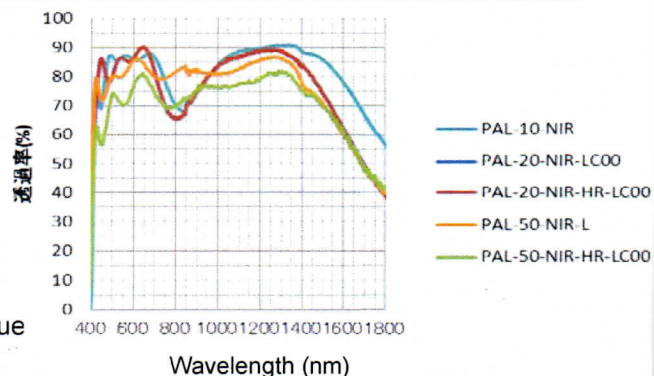
Near Infrared Objective Lenses (PAL-NIR)

- Bright Field Inspection and Laser processing

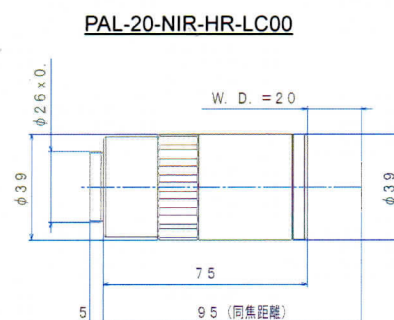
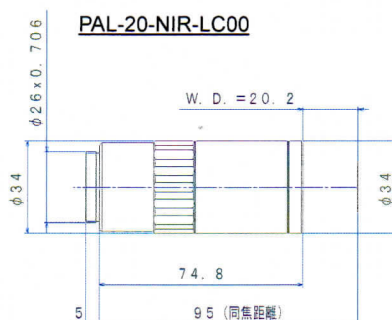
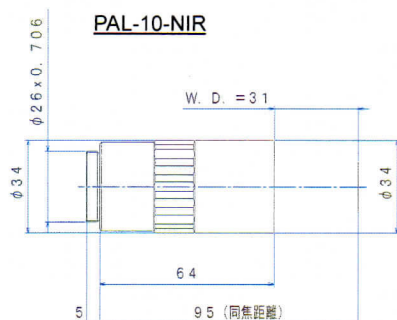


- Infinity Corrected
- 1064nm
- Plan Apochromat
- Laser damage threshold (※)
0.1 J/cm² (5:0.2 J/cm² (1064nm)

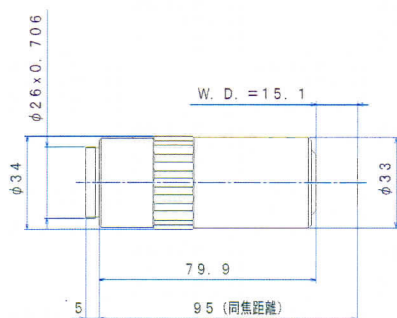
※Pulse width:10ns, Frequency:20Hz, reference value



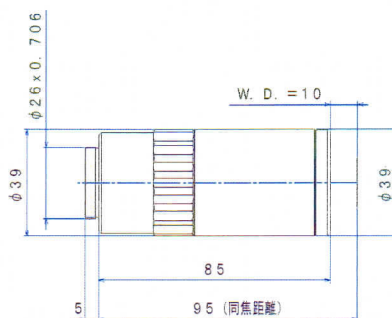
Outline Drawings



PAL-50-NIR-L



PAL-50-NIR-HR-LC00



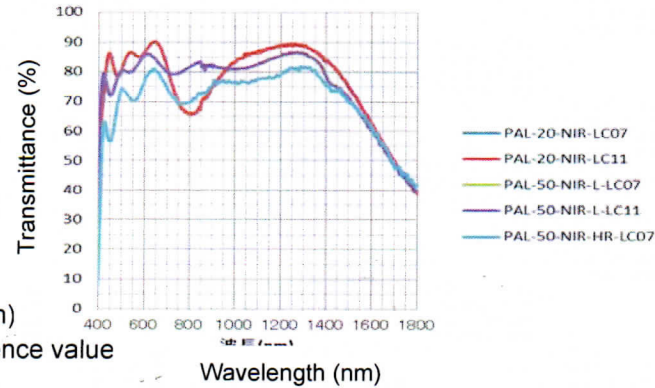
Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PAL-10-NIR	MPlanApo NIR 10x	10x	20	0.3	31.0	0.92	3.1	φ2.4	0.48×0.64	0.3
PAL-20-NIR-LC00	MPlanApo NIR 20x	20x	10	0.4	20.2	0.69	1.7	φ1.2	0.24×0.32	0.36
PAL-20-NIR-HR-LC00	MPlanApo NIR HR 20x	20x	10	0.45	20.0	0.61	1.4	φ1.2	0.24×0.32	0.42
PAL-50-NIR-L	MPlanApo NIR 50x	50x	4	0.45	15.1	0.61	1.4	φ0.48	0.10×0.13	0.34
PAL-50-NIR-HR-LC00	MPlanApo NIR HR 50x	50x	4	0.67	10	0.41	0.61	φ0.48	0.10×0.13	0.48

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Near Infrared Objective Lenses with Cover Glass thickness compensation (PAL-NIR-LC)

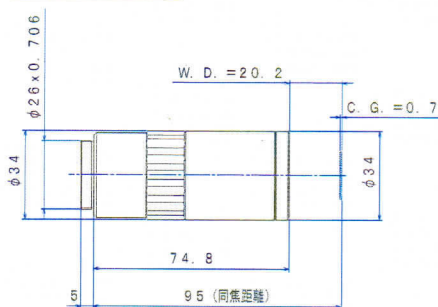


- Bright Field Inspection and Laser processing
 - Infinity Corrected
 - 1064nm
 - Cover glass thickness compensation (t=0.7mm and 1.1mm)
 - Plan Apochromat
 - Laser damage threshold (※)
 - 0.1 J/cm² (532nm) , 0.2 J/cm² (1064 nm)
- ※Pulse width:10ns, Frequency:20Hz, reference value

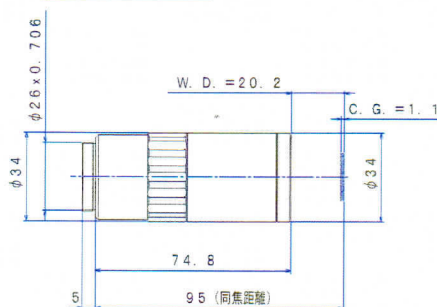


Outline Drawings

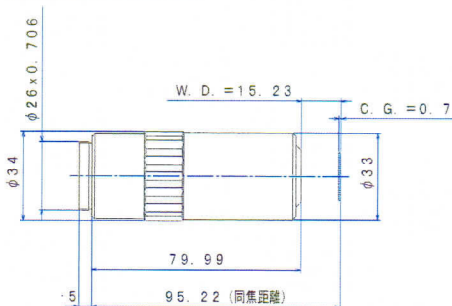
PAL-20-NIR-LC07



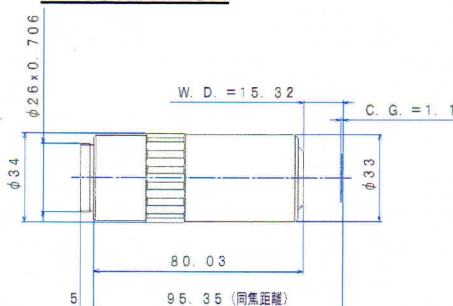
PAL-20-NIR-LC11



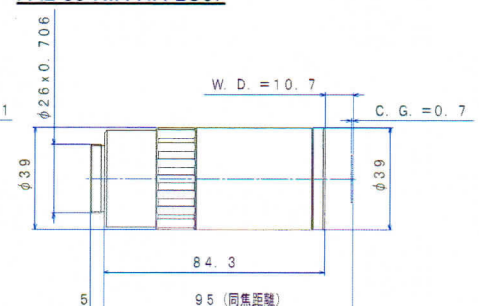
PAL-50-NIR-L-LC07



PAL-50-NIR-L-LC11



PAL-50-NIR-HR-LC07



Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece $\phi 24\text{mm}$) [mm]	(1/2"CCD) [mm]	
PAL-20-NIR-LC07	LCD MPlanApo NIR 20x(t0.7)	20×	10	0.4	19.98	0.69	1.7	$\phi 1.7$	0.24×0.32	0.36
PAL-20-NIR-LC11	LCD MPlanApo NIR 20x(t1.1)	20×	10	0.4	19.85	0.69	1.7	$\phi 1.7$	0.24×0.32	0.36
PAL-50-NIR-L-LC07	LCD MPlanApo NIR 50x(t0.7)	50×	4	0.45	15.01	0.61	1.4	$\phi 0.46$	0.10×0.13	0.34
PAL-50-NIR-L-LC11	LCD MPlanApo NIR 50x(t1.1)	50×	4	0.45	14.97	0.61	1.4	$\phi 0.46$	0.10×0.13	0.34
PAL-50-NIR-HR-LC07	LCD MPlanApo NIR HR 50x(t0.7)	50×	4	0.67	10.48	0.41	0.61	$\phi 0.46$	0.10×0.13	0.48

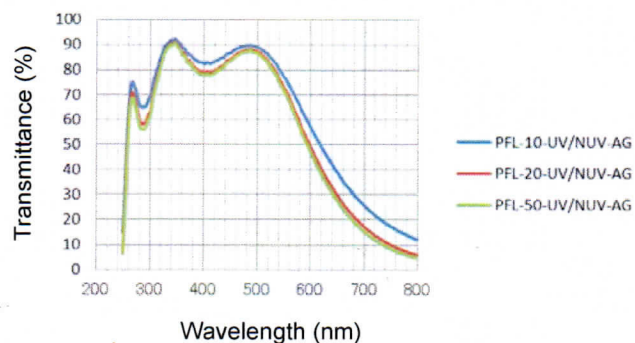
※Resolution and focal depth are calculated value at wavelength of 0.55μm.

※Working distance: value at air

Ultra-violet Objective Lenses (PFL-UV / NUV-AG)



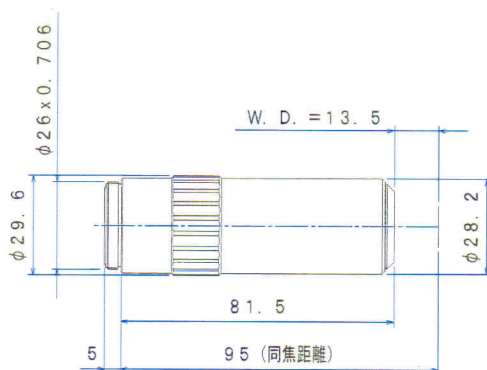
- Bright Field Inspection and Laser processing
- Infinity Corrected
- 266nm, 355nm and 532nm
- Higher Laser damage threshold with Air-gap design
- Laser damage threshold (※)
 0.09 J/cm² (266nm)
 0.1 J/cm² (355nm)
 0.2 J/cm² (532nm)



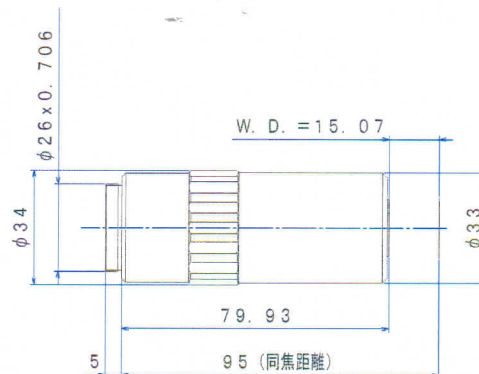
※Pulse width:10ns, Frequency:20Hz, reference value

Outline Drawings

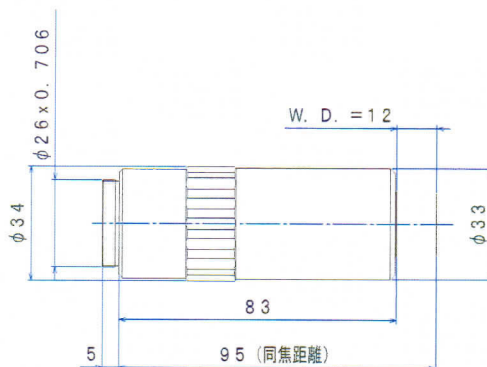
PFL-10-UV/NUV-AG



PFL-20-UV/NUV-AG-A



PFL-50-UV/NUV-AG-A



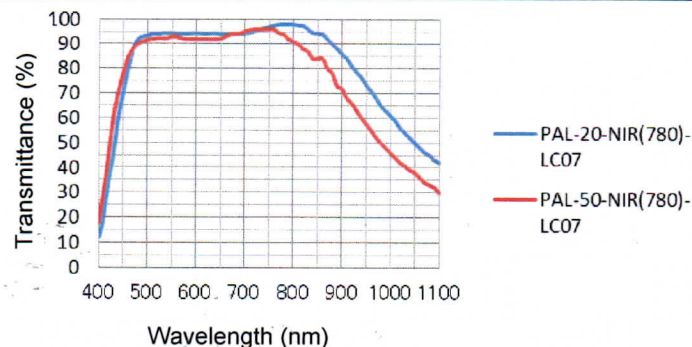
Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PFL-10-UV/NUV-AG	MPlan UV/NUV 10x	10x	20	0.2	13.5	1.4	6.9	φ2.4	0.48x0.64	0.3
PFL-20-UV/NUV-AG-A	MPlan UV/NUV 20x	10x	10	0.36	15.07	0.76	2.1	φ1.2	0.24x0.32	0.35
PFL-50-UV/NUV-AG-A	MPlan UV/NUV 50x	50x	4	0.42	12	0.65	1.6	φ0.48	0.10x0.13	0.41

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

Near Infrared Objective Lenses with Cover Glass thickness compensation (PAL-NIR(780))



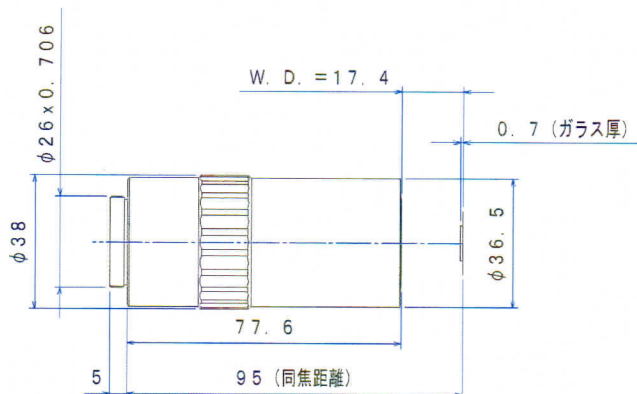
- Bright Field Inspection and Laser processing
- Infinity Corrected
- Plan Apochromat
- Laser damage threshold (※)
0.1 J/cm² (532nm)
0.15 J/cm² (780nm)



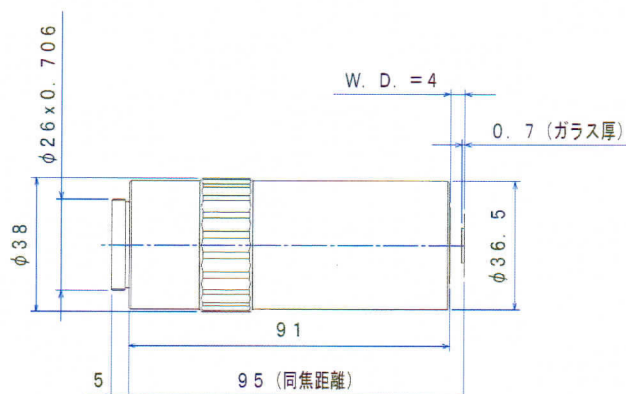
※Pulse width:10ns, Frequency:20Hz, reference value

Outline Drawing

PAL-20-NIR(780)-LC07



PAL-50-NIR(780)-LC07



Part Number	Description	Magnification	Focal length f [mm]	N.A.	Working distance (W.D.) [mm]	Resolution [μm]	Focal depth ±D.F [μm]	Real field of View		Weight [kg]
								(Eyepiece φ24mm) [mm]	(1/2"CCD) [mm]	
PAL-20-NIR(780)-LC07	LCD MPlanApo NIR(780) 20x(t0.7)	20x	10	0.45	17.2	0.6	1.4	φ1.2	0.24x0.32	0.34
PAL-50-NIR(780)-LC07	LCD MPlanApo NIR(780) 50x(t0.7)	50x	4	0.8	3.8	0.3	0.4	φ0.48	0.10x0.13	0.44

※Resolution and focal depth are calculated value at wavelength of 0.55μm.

※Working distance: value at air

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