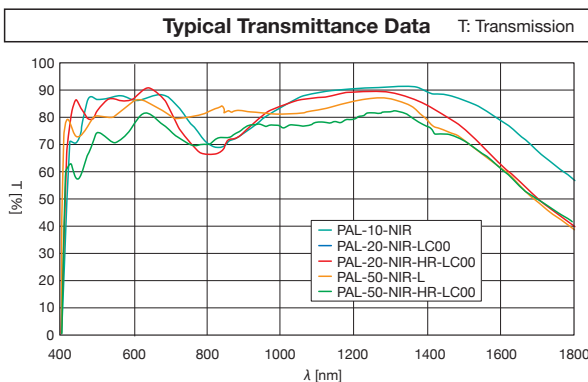


Infrared (NIR) Objective Lenses | PAL-NIR

This is a high NA infinity corrected objective lens for laser processing (femtosecond laser and fundamental of YAG laser). You can also observe the laser beam coaxially with a laser processed surface that is designed to reduce the aberration of the visible wavelength.

- With its long working distance and field curvature corrected, its natural observation image is obtained to the periphery of the visual field.
- It is the long working infinity correction function that is used to introduce a laser system and coaxial observation.
- It is also used for the observation of infrared light.
- PAL-20-NIR-LC00/PAL-20-NIR-HR-LC00/PAL-50-NIR-HR-LC00 include protective glass unit ($t=1.8\text{mm}$). The protective glass will help protect the objective lens from debris spattering and scattered by laser processing. The protective glass unit can be replaced.
- These variety of objective lens can be used with a pulse laser of visible light such as 532nm. The damage threshold of each lens is $0.1\text{J}/\text{cm}^2$ at 532nm, $0.2\text{J}/\text{cm}^2$ at 1064nm (reference). (Laser pulse width 10nSec, repetition frequency 20Hz)



Guide

- ▶ Available fixed objective lens holder (LHO-26).
[WEB Reference](#) **Catalog Code** W4024
- ▶ When the objective lens is fixed to a 2 axis holder, please consult our Sales Division.
- ▶ For laser processing, we offer a dichoric block (DIMC) and for laser unit with coaxial illumination and observation (OUCI-2).
[WEB Reference](#) **Catalog Code** W2041

Attention

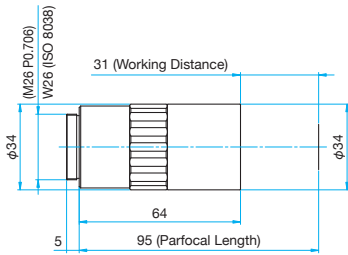
- ▶ When an objective lens is used in laser processing, use the diameter of the incident beam to extend to a size of half the pupil diameter ($1/e^2$). A small light spot cannot be achieved when the incident beam is too narrow. Please note if there is a laser energy density increase, there will be a high possibility of damage to the objective lens.
- ▶ The surface of an objective lens can be contaminated by debris during processing. To avoid this, please have sufficient working distance (WD) and insert a thin protective glass on the objective.
- ▶ If the incident laser beam femtosecond is below 100fs, there is a possibility that the pulse width will spread.
- ▶ Magnification is the value when using the imaging lens $f=200\text{mm}$. When used in a microscope lens barrel from other manufacturers there may be different magnifications. The actual magnification should be calculated from the ratio of the focal length of the objective lens and the focal length of the imaging lens to verify the focal length of the imaging lens barrel to be used.
- ▶ PAL-20-NIR-HR-LC00/PAL-50-NIR-HR-LC00 is designed in consideration of the thickness of including protective glass. If user removes the protective glass, the objective will not meet the performance specifications noted.

Specifications										
Part Number	Item name	Magnification	Focal length f [mm]	Numerical aperture NA	Working distance WD [mm]	Resolution ($\lambda=550\text{nm}$) [μm]	Focal depth ($\lambda=550\text{nm}$) [μm]	Real field of view (Eyepiece $\phi 24\text{mm}$) [mm]	(Imaging device 1/2-inch) [mm]	Weight [kg]
PAL-10-NIR	MPlanApo NIR 10x	10x	20	0.30	31.0	0.92	± 3.1	$\phi 2.4$	0.48×0.64	0.30
PAL-20-NIR-LC00	MPlanApo NIR 20x	20x	10	0.40	20.2	0.69	± 1.7	$\phi 1.2$	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	$\phi 1.2$	0.24×0.32	0.42
PAL-50-NIR-L	MPlanApo NIR 50x	50x	4	0.45	15.1	0.61	± 1.4	$\phi 0.48$	0.10×0.13	0.34
PAL-50-NIR-HR-LC00	MPlanApo NIR HR 50x	50x	4	0.67	10.0	0.41	± 0.61	$\phi 0.48$	0.10×0.13	0.48

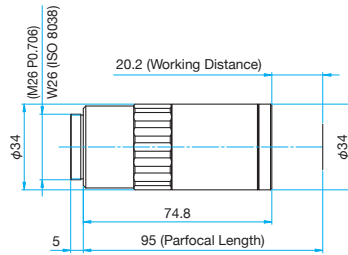
Outline Drawing

(in mm)

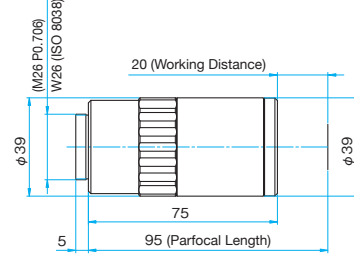
PAL-10-NIR



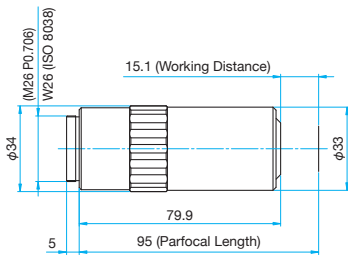
PAL-20-NIR-LC00



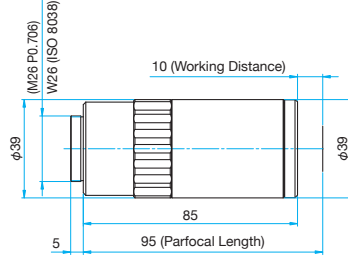
PAL-20-NIR-HR-LC00



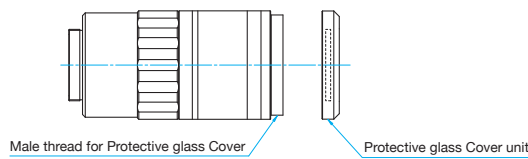
PAL-50-NIR-L



PAL-50-NIR-HR-LC00



How to replace the protective glass unit of PAL-20-NIR-HR-LC00/PAL-50-NIR-HR-LC00



Compatible Optic Mounts

LHO-26

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fθ Lenses

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Expanders

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