

# Mid-IR Focusing Objectives 2 $\mu\text{m}$ to 12 $\mu\text{m}$



## Fiber-Optic Coupling Lenses

innpho's Mid-IR Focusing Objectives are designed to provide maximum coupling efficiency in coupling the output from a mid-IR source into single-mode or multimode IR transmitting fibers.



## Design Features

### Maximum Coupling Efficiency

- NA match to fiber NA
- Focal Spot smaller than fiber core diameter
- ZnSe Lens AR coated at designated wavelengths
- Lens Design: micro aspheric, diffraction limited

### Easy Alignment

- Using HeNe or other visible laser
- Long Working Distance where possible

### Ease of Mounting, 2 standard mounting options:

- Microscope Objective Cell with industry standard RMS thread
- 1" dia x 1/4" black anodized plate
- Other mounting options on special order

Catalog Number	Clear Aperture	Numerical Aperture	Working Distance	Focal Length
LFO-5-6- $\lambda$	5 mm	0.25	5.3 mm	6 mm
LFO-5-12- $\lambda$	5 mm	0.13	11.5 mm	12 mm
LFO-5-18- $\lambda$	5 mm	0.08	17.5 mm	18 mm

When ordering, specify wavelength. For example, LFO-5-6-4.75

## Focal Spot ( $\mu\text{m}$ ) Objective Focal Lengths 6mm, 12mm, 18mm

Beam Diameter	Focal Length			Focal Length			Focal Length		
	6 mm	12 mm	18 mm	6 mm	12 mm	18 mm	6 mm	12 mm	18 mm
2.0 mm	15	30	46	23	46	69	30	61	91
2.5 mm	12	24	37	18	37	55	24	49	73
3.0 mm	14	20	30	15	30	46	20	41	61
4.0 mm	32	15	23	32	23	34	32	30	46
5.0 mm	63	16	18	63	18	27	63	24	37
	Wavelength 4 $\mu\text{m}$			Wavelength 6 $\mu\text{m}$			Wavelength 8 $\mu\text{m}$		

## ANTIREFLECTION COATINGS

Typical Reflectance at wavelengths shown.

Center Wavelength	Reflectance at Center $\lambda$	$\lambda$ Spread at R = 1%
3.75 $\mu\text{m}$	~0.20%	(3.25-4.25) $\mu\text{m}$
4.75 $\mu\text{m}$	<0.25%	(4.25-5.5) $\mu\text{m}$
8.5 $\mu\text{m}$	~0.25%	(7.5-9.5) $\mu\text{m}$