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RAYS OPTICS CO., LTD

COMPANY PROFILE



Rays optics co., ltd was established in 2013. It is professional optical components and laser accessories, as well as a high-tech industry engaged in the research, production and development of optical products.

A manufacturing company integrating R&D and sales, with more than 30 technical personnel who have been engaged in the optical filed for many years.

The company's products are mainly used in Life Science, Metrology, Laser Applications, Imaging and Display Aerospace Industry, Semiconductor, Safety and Security, Automotive, Industrial engineering, Research and Development.

Rays optics aims to manufacture optical components based on our clients' precise requirements. We are a one-stop shop for optics, covering design, prototyping, and volume production. We are optical technology partners for our customers.

Our advantage is that we can process a wide range of products with high precision, high production capacity, short production cycle, and large, medium and small lots. Our clients are leading optical companies in Germany, Switzerland, Italy, Israel, The UK and United States, etc. Nearly 99% of the manufactured goods are for export.

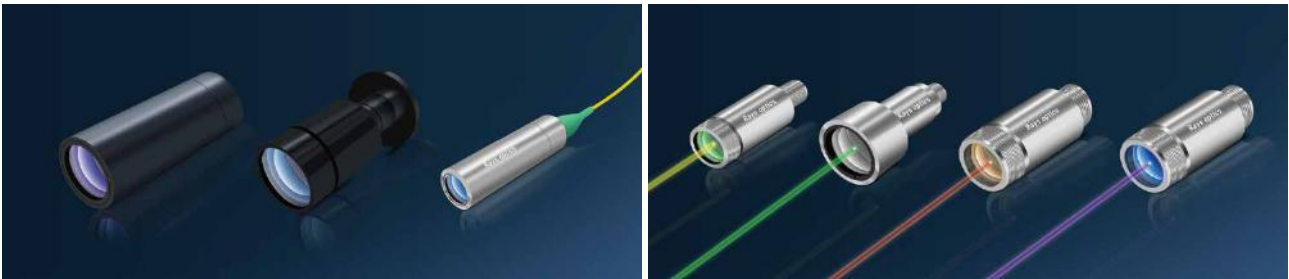


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LASER FIBER COLLIMATOR AND COUPLER

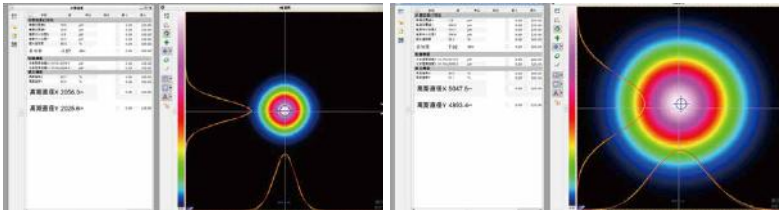
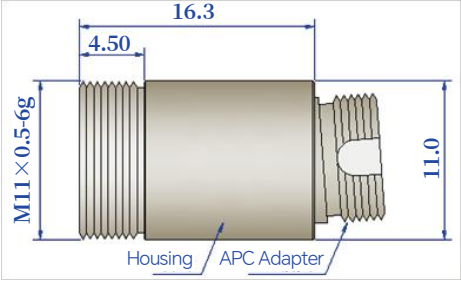
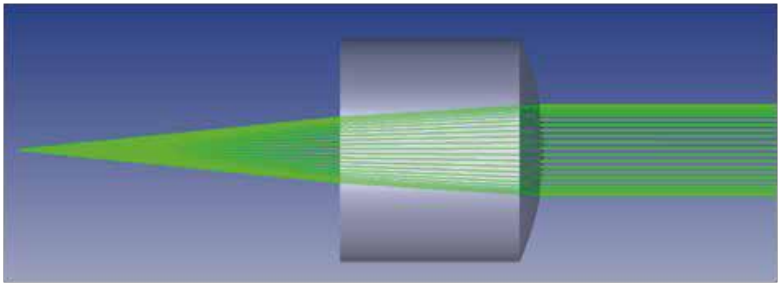


1. Aspheric Lenses Collimators

A fixed focal length is used because non-spherical lenses has a design that corrects for chromatic aberration and have good collimation of the light beam, resulting in a Gaussian distribution of energy in the output optical beam. The lens is double-sided and coated with anti-reflection films to minimize surface reflection. However, the effective focal length (EFL) of aspheric lenses is closely related to wavelength, resulting in chromatic aberration. The relative position of the lens and optical fiber is precisely adjusted to ensure that the angle of the output light is within 0.5°, and standard manufacturing processes are used to ensure product stability, consistency, and good compatibility.

Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Input Fiber Type	Transmittance	Max. Power	Connector
405nm	±5nm	0.8mm±10%	0.06°+0.01°	4.45mm	Φ11*10.5mm	0.25	405HP	≥95%	1W/mm2	FC/PC FC/APC SMA905
	±5nm	0.89mm±10%	0.03° +0.01°	6.02mm	Φ11*13mm	0.41				
	±5nm	1.13mm±10%	0.03° +0.01°	7.70mm	Φ12*12.7mm	0.51				
	±5nm	2.2mm±10%	0.02° +0.01°	10.67mm	Φ11*16.6mm	0.26				
	±5nm	2.17mm±10%	0.01° +0.01°	14.71mm	Φ11*20mm	0.17				
	±5nm	2.61mm±10%	0.01° +0.01°	17.71mm	Φ11*23mm	0.16				
	±5nm	3.39mm±10%	0.01° +0.01°	23.00mm	Φ12*29mm	0.17				
450nm	±5nm	0.82mm±10%	0.05°+0.01°	4.50mm	Φ11*10.5mm	0.25	460HP			
	±5nm	0.94mm±10%	0.04° +0.01°	6.07mm	Φ11*13mm	0.41				
	±5nm	1.2mm±10%	0.03° +0.01°	7.77mm	Φ12*12.7mm	0.51				
	±5nm	2.3mm±10%	0.02° +0.01°	10.77mm	Φ11*16.6mm	0.26				
	±5nm	2.30mm±10%	0.01° +0.01°	14.86mm	Φ11*20mm	0.17				
	±5nm	2.77mm±10%	0.01° +0.01°	17.88mm	Φ11*23mm	0.16				
	±5nm	3.60mm±10%	0.01° +0.01°	23.24mm	Φ12*29mm	0.17				

Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Input Fiber	Transmittance	Max. Power	Connector
520nm	±5nm	0.84mm±10%	0.05°+0.01°	4.55mm	Φ11*10.5mm	0.25	460HP	≥95%	1W/mm2	FC/PC FC/APC SMA905
	±5nm	1.07mm±10%	0.04°+0.01°	6.13mm	Φ11*13mm	0.41				
	±5nm	1.37mm±10%	0.03°+0.01°	7.86mm	Φ12*12.7mm	0.51				
	±5nm	2.3mm±10%	0.02° +0.01°	10.89mm	Φ11*16.6mm	0.25				
	±5nm	2.62mm±10%	0.015° +0.01°	15.01mm	Φ11*19mm	0.16				
	±5nm	3.15mm±10%	0.01° +0.01°	18.07mm	Φ11*23mm	0.15				
	±5nm	4.09mm±10%	0.01° +0.01°	23.49mm	Φ12*29mm	0.17				
633nm	±5nm	0.86mm±10%	0.05°+0.01°	4.59mm	Φ11*10.5mm	0.24	630HP			
	±5nm	1.25mm±10%	0.04°+0.01°	6.19mm	Φ11*13mm	0.4				
	±5nm	1.60mm±10%	0.03°+0.01°	7.94mm	Φ12*12.7mm	0.5				
	±5nm	2.3mm±10%	0.02° +0.01°	10.99mm	Φ11*16.6mm	0.25				
	±5nm	3.06mm±10%	0.015° +0.01°	15.17mm	Φ11*19mm	0.16				
	±5nm	3.68mm±10%	0.01° +0.01°	18.26mm	Φ11*23mm	0.15				
	±5nm	4.78mm±10%	0.01° +0.01°	23.74mm	Φ12*29mm	0.16				
780nm	±5nm	1.0mm±10%	0.06°+0.01°	4.63mm	Φ11*10.5mm	0.24	780HP			
	±5nm	1.29mm±10%	0.04°+0.01°	6.23mm	Φ11*13mm	0.4				
	±5nm	1.65mm±10%	0.03°+0.01°	8.0mm	Φ12*12.7mm	0.5				
	±5nm	2.4mm±10%	0.025° +0.01°	11.09mm	Φ11*16.6mm	0.25				
	±5nm	3.16mm±10%	0.02° +0.01°	15.29mm	Φ11*19mm	0.16				
	±5nm	3.81mm±10%	0.015° +0.01°	18.40mm	Φ11*23mm	0.15				
	±5nm	4.95mm±10%	0.01° +0.01°	23.93mm	Φ12*29mm	0.16				



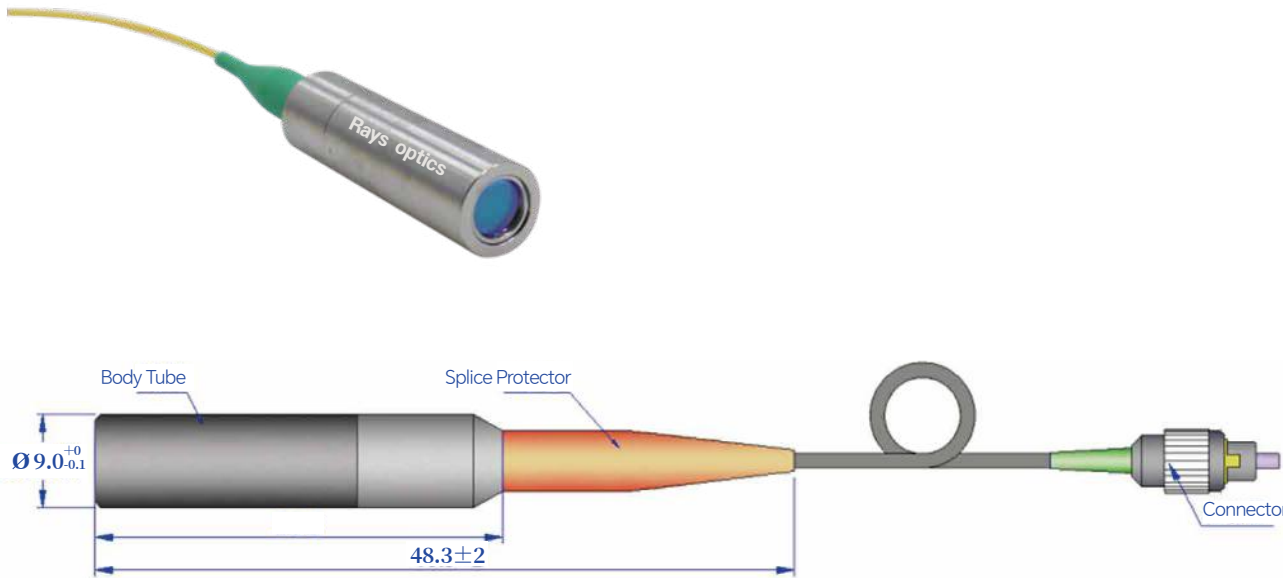


Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Input Fiber Type	Transmittance	Max. Power	Connector
850nm	±5nm	1.0mm±10%	0.06°+0.01°	4.64mm	Φ11*10.5mm	0.24	780HP	≥95%	1W/mm2	FC/PC FC/APC SMA905
	±5nm	1.35mm±10%	0.05°+0.01°	6.25mm	Φ11*13mm	0.4				
	±5nm	1.74mm±10%	0.04°+0.01°	8.02mm	Φ12*12.7mm	0.5				
	±5nm	2.4mm±10%	0.03° +0.01°	11.12mm	Φ11*16.6mm	0.25				
	±5nm	3.32mm±10%	0.02° +0.01°	15.33mm	Φ11*19mm	0.16				
	±5nm	3.99mm±10%	0.015° +0.01°	18.45mm	Φ11*23mm	0.15				
	±5nm	5.19mm±10%	0.01° +0.01°	24.00mm	Φ12*29mm	0.16				
980nm	±5nm	1.0mm±10%	0.07°+0.01°	4.66mm	Φ11*10.5mm	0.24	HI1060			
	±5nm	1.45mm±10%	0.05°+0.01°	6.27mm	Φ11*13mm	0.4				
	±5nm	1.86mm±10%	0.04°+0.01°	8.05mm	Φ12*12.7mm	0.5				
	±5nm	2.3mm±10%	0.03° +0.01°	11.16mm	Φ11*16.6mm	0.25				
	±5nm	3.56mm±10%	0.02° +0.01°	15.39mm	Φ11*19mm	0.16				
	±5nm	4.28mm±10%	0.02° +0.01°	18.53mm	Φ11*23mm	0.15				
	±5nm	5.57mm±10%	0.01° +0.01°	24.10mm	Φ12*29mm	0.16				
1064nm	±5nm	1.0mm±10%	0.08°+0.01°	4.67mm	Φ11*10.5mm	0.24				
	±5nm	1.42mm±10%	0.055°+0.01°	6.29mm	Φ11*13mm	0.4				
	±5nm	1.82mm±10%	0.04°+0.01°	8.07mm	Φ12*12.7mm	0.5				
	±5nm	2.3mm±10%	0.03° +0.01°	11.19mm	Φ11*16.6mm	0.25				
	±5nm	3.48mm±10%	0.02° +0.01°	15.43mm	Φ11*19mm	0.16				
	±5nm	4.19mm±10%	0.02° +0.01°	18.57mm	Φ11*23mm	0.15				
	±5nm	5.45mm±10%	0.01° +0.01°	24.15mm	Φ12*29mm	0.16				
1310nm	±5nm	0.84mm±10%	0.11°+0.01°	4.70mm	Φ11*10.5mm	0.24				
	±5nm	1.10mm±10%	0.09° +0.01°	6.32mm	Φ11*13mm	0.4				
	±5nm	1.41mm±10%	0.07°+0.01°	8.12mm	Φ12*12.7mm	0.49				
	±5nm	2.1mm±10%	0.05° +0.01°	11.26mm	Φ11*16.6mm	0.25				
	±5nm	2.70mm±10%	0.035° +0.01°	15.52mm	Φ11*19mm	0.16				
	±5nm	3.25mm±10%	0.03° +0.01°	18.68mm	Φ11*23mm	0.15				
	±5nm	4.22mm±10%	0.02° +0.01°	24.29mm	Φ12*29mm	0.16				
1550nm	±5nm	0.87mm±10%	0.11°+0.01°	4.74mm	Φ11*10.5mm	0.24	Smf-28e			
	±5nm	1.24mm±10%	0.09°+0.01°	6.36mm	Φ11*13mm	0.39				
	±5nm	1.60mm±10%	0.07°+0.01°	8.17mm	Φ12*12.7mm	0.49				
	±5nm	2.1mm±10%	0.05° +0.01°	11.32mm	Φ11*16.6mm	0.24				
	±5nm	3.05mm±10%	0.04° +0.01°	15.61mm	Φ11*19mm	0.16				
	±5nm	3.67mm±10%	0.03° +0.01°	18.79mm	Φ11*23mm	0.15				
	±5nm	4.77mm±10%	0.02° +0.01°	24.42mm	Φ12*29mm	0.16				
1650nm	±5nm	0.90mm±10%	0.11°+0.01°	4.74mm	Φ11*10.5mm	0.24				
	±5nm	1.26mm±10%	0.10°+0.01°	6.37mm	Φ11*13mm	0.39				
	±5nm	1.62mm±10%	0.07°+0.01°	8.19mm	Φ12*12.7mm	0.49				
	±5nm	2.15mm±10%	0.05° +0.01°	11.35mm	Φ11*16.6mm	0.24				
	±5nm	3.10mm±10%	0.04° +0.01°	15.65mm	Φ11*19mm	0.16				
	±5nm	3.73mm±10%	0.03° +0.01°	18.84mm	Φ11*23mm	0.15				
	±5nm	4.85mm±10%	0.025° +0.01°	24.47mm	Φ12*29mm	0.16				

- All testing data for beam size and divergence angle are obtained by connecting the standard jumpers from Rays optics.
- Also applicable for polarization maintaining fiber with corresponding wavelength.
- Non-magnetic material housing (NUSPEEK-1000) can be customized.

2. Aspheric Lenses Collimators with Fiber

Using a compact structural design with tilted end fibers and aspheric lenses that have been accurately adjusted, the output Gaussian beam quality and excellent collimation characteristics are ensured. The lenses and fiber surfaces are coated with anti-reflection films, greatly reducing the back reflection of the output end face and lowering optical link noise. The long-focus collimator uses a bending housing to correct the output angle caused by the tilted end fibers, while the short-focus collimator uses a straight-through housing where the angle of the output light caused by the tilted end fibers can be ignored.



Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Output Loss	Return Loss	Fiber Type	MFD	Max. Power	Connector
405nm	±5nm	0.85mm±0.1mm	0.06° +0.01°	4.45mm	Φ9.0*L23mm	0.25	≤0.5dB	≥55dB	Nufern 405HP	3.0±0.5um	500mw	FC/PC FC/APC SMA905
	±5nm	2.01mm±0.2mm	0.02° +0.01°	10.67mm	Φ9.0*L28.5mm	0.25	≤0.5dB	≥55dB				
532nm	±5nm	0.84mm±0.1mm	0.05° +0.01°	4.50mm	Φ9.0*L23mm	0.24	≤0.5dB	≥55dB	Nufern 460HP	3.6±0.5um		
	±5nm	2.1mm±0.2mm	0.02° +0.01°	10.87mm	Φ9.0*L28.5mm	0.24	≤0.5dB	≥55dB				
633nm	±5nm	0.86mm±0.1mm	0.05°+0.01°	4.59mm	Φ9.0*L23mm	0.24	≤0.5dB	≥55dB	Nufern 630HP	4.0±0.5um		
	±5nm	2.06mm±0.2mm	0.02° +0.01°	10.96mm	Φ9.0*L28.5mm	0.24	≤0.5dB	≥55dB				
	±5nm	3.3mm±0.2mm	0.015° +0.01°	18.14mm	Φ9.0*L35mm	0.15	≤0.5dB	≥55dB				
780nm	±5nm	1.0mm±0.1mm	0.06° +0.01°	4.63mm	Φ9.0*L23mm	0.24	≤0.5dB	≥55dB	Nufern 780HP	4.5±0.5um		
	±5nm	2.1mm±0.2mm	0.026° +0.01°	11.06mm	Φ9.0*L28.5mm	0.24	≤0.5dB	≥55dB				
	±5nm	3.2mm±0.2mm	0.02° +0.01°	15.29mm	Φ9.0mm*L35mm	0.16	≤0.5dB	≥55dB				
850nm	±5nm	1.0mm±0.1mm	0.06°+0.01°	4.64mm	Φ9.0*L23mm	0.24	≤0.5dB	≥55dB	Nufern 780HP	5.0±0.5um		
	±5nm	2.41mm±0.2mm	0.03° +0.01°	11.10mm	Φ9.0*L28.5mm	0.24	≤0.5dB	≥55dB				
	±5nm	3.8mm±0.2mm	0.02° +0.01°	18.45mm	Φ9.0*L35mm	0.15	≤0.5dB	≥55dB				
980nm	±5nm	1.0mm±0.1mm	0.07°+0.01°	4.66mm	Φ9.0*L23mm	0.24	≤0.3dB	≥55dB	Corning Hi1060	5.9±0.3um		
	±5nm	2.4mm±0.2mm	0.03° +0.01°	11.16mm	Φ9.0*L28.5mm	0.24	≤0.3dB	≥55dB				
	±5nm	4.0mm±0.2mm	0.02° +0.01°	18.58mm	Φ9.0*L35mm	0.15	≤0.3dB	≥55dB				
1064nm	±5nm	1.0mm±0.1mm	0.08°+0.01°	4.67mm	Φ9.0*L23mm	0.24	≤0.3dB	≥55dB	Corning Hi1060	6.2±0.3um		
	±5nm	2.4mm±0.2mm	0.032° +0.01°	11.18mm	Φ9.0*L28.5mm	0.24	≤0.3dB	≥55dB				
	±5nm	3.8mm±0.2mm	0.02° +0.01°	18.58mm	Φ9.0*L35mm	0.15	≤0.3dB	≥55dB				
1310nm	±5nm	0.84mm±0.1mm	0.11°+0.01°	4.70mm	Φ9.0*L23mm	0.24	≤0.25dB	≥55dB	G652D G657A1 G657A2	9.6±0.4um		
	±5nm	2.04mm±0.2mm	0.047° +0.01°	11.25mm	Φ9.0*L28.5mm	0.23	≤0.25dB	≥55dB				
	±5nm	3.35mm±0.2mm	0.029° +0.01°	18.67mm	Φ9.0*L35mm	0.15	≤0.25dB	≥55dB				
1550nm	±5nm	0.87mm±0.1mm	0.11°+0.01°	4.74mm	Φ9.0*L23mm	0.24	≤0.25dB	≥55dB	G652D G657A1 G657A2	10.4±0.5um		
	±5nm	2.10mm±0.2mm	0.053° +0.01°	11.31mm	Φ9.0*L28.5mm	0.23	≤0.25dB	≥55dB				
	±5nm	3.4mm±0.2mm	0.032° +0.01°	18.75mm	Φ9.0*L35mm	0.15	≤0.25dB	≥55dB				

- Waist beam size: calculated using the theory of single-mode optical fiber for each wavelength, taken at the 1/e2 intensity point of the Gaussian beam.
- Far-field divergence angle of the beam: calculated according to the Gaussian beam 1/e2 theory.

3. Aspheric Lenses Collimators with Polarization-Maintaining Fiber

It consists of a group of long focal length collimating optical systems with chromatic aberration and distortion compensation design, making the focal length of the collimator insensitive to wavelength bandwidth. The divergent light beam emitted from the optical fiber, providing a good collimating effect and beam shape within a certain distance range. The optical surfaces of the lens group are coated with anti-reflection film to minimize surface reflection. The relative position of the lens and fiber is precisely adjusted to ensure that the deviation angle of the emitted light is within 0.3°, and standardized manufacturing processes ensure stable consistency of the product.

Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Fiber Type	MFD	Output Loss	Return Loss	Extinction Ratio	Max. Power	Connector
405nm	±5nm	0.86mm±0.1mm	0.05°+0.01°	4.59mm	Φ9.0mm*L23±1mm	0.24	Nufern PM405	3.0±0.5um	≤0.5dB	≥55dB	≥20dB	500mw	FC/PC FC/APC SMA905
	±5nm	2.06mm±0.2mm	0.02° +0.01°	10.96mm	Φ9.0mm*L29±1mm	0.24							
	±5nm	3.3mm±0.2mm	0.015° +0.01°	18.14mm	Φ9.0mm*L35±1mm	0.15							
532nm	±5nm	0.86mm±0.1mm	0.05°+0.01°	4.59mm	Φ9.0mm*L23±1mm	0.24	Nufern PM460	3.6±0.5um					
	±5nm	2.06mm±0.2mm	0.02° +0.01°	10.96mm	Φ9.0mm*L29±1mm	0.24							
	±5nm	3.3mm±0.2mm	0.015° +0.01°	18.14mm	Φ9.0mm*L35±1mm	0.15							
633nm	±5nm	0.86mm±0.1mm	0.05°+0.01°	4.59mm	Φ9.0mm*L23±1mm	0.24	Nufern PM630	4.0±0.5um					
	±5nm	2.06mm±0.2mm	0.02° +0.01°	10.96mm	Φ9.0mm*L29±1mm	0.24							
	±5nm	3.3mm±0.2mm	0.015° +0.01°	18.14mm	Φ9.0mm*L35±1mm	0.15							
780nm	±5nm	1.0mm±0.1mm	0.06°+0.01°	4.63mm	Φ9.0mm*L23±1mm	0.24	Nufern PM780	4.5±0.5um					
	±5nm	2.4mm±0.2mm	0.026° +0.01°	11.06mm	Φ9.0mm*L29±1mm	0.24							
	±5nm	4.0mm±0.2mm	0.01° +0.01°	18.33mm	Φ9.0mm*L35±1mm	0.15							
850nm	±5nm	1.0mm±0.1mm	0.06°+0.01°	4.63mm	Φ9.0mm*L23±1mm	0.24	Nufern PM780	4.5±0.5um					
	±5nm	2.4mm±0.2mm	0.026° +0.01°	11.06mm	Φ9.0mm*L29±1mm	0.24							
	±5nm	4.0mm±0.2mm	0.01° +0.01°	18.33mm	Φ9.0mm*L35±1mm	0.15							
980nm	±5nm	1.0mm±0.1mm	0.07°+0.01°	4.66mm	Φ9.0mm*L23±1mm	0.24	Nufern PM980	6.6±0.5um					
	±5nm	2.4mm±0.2mm	0.03° +0.01°	11.16mm	Φ9.0mm*L29±1mm	0.24							
	±5nm	4.0mm±0.2mm	0.02° +0.01°	18.52mm	Φ9.0mm*L35±1mm	0.15							
1310nm	±5nm	0.84mm±0.1mm	0.11°+0.01°	4.70mm	Φ9.0mm*L23±1mm	0.24	Corning PM1300	9.0±0.5um	≤0.25dB				
	±5nm	2.04mm±0.2mm	0.047° +0.01°	11.25mm	Φ9.0mm*L29±1mm	0.23							
	±5nm	3.35mm±0.2mm	0.029° +0.01°	18.67mm	Φ9.0mm*L35±1mm	0.15							
1550nm	±5nm	0.87mm±0.1mm	0.11°+0.01°	4.74mm	Φ9.0mm*L23±1mm	0.24	Corning PM1550	10.5±0.5um					
	±5nm	2.10mm±0.2mm	0.053° +0.01°	11.31mm	Φ9.0mm*L29±1mm	0.23							
	±5nm	3.4mm±0.2mm	0.032° +0.01°	18.75mm	Φ9.0mm*L35±1mm	0.15							



4. Single-mode Fiber Collimators

It is packaged by precise positioning of fiber pigtail and focusing lens, which can transform the output light of fiber into parallel light beam (Gaussian beam) or couple external parallel light into the fiber. It can also be used alone to achieve the required spot size at a specific position according to the predetermined divergence angle. According to the working distance, it can be divided into fixed working distance (fixed focus) collimator and variable collimator for working distance range.



Fixed Working Distance

Wavelength	Bandwidth	WaistBeam	Beam waist distance	Divergence Angle	EFL	Package Dia.	Working Distance	Output Loss	Insert Loss	Return Loss	MFD	Fiber Type	Max. Power	Connector
405nm	±20nm	0.27mm±0.02mm	50mm	2.1mrad	1.69mm	Φ3.4mm* L14mm	100mm	≤0.5dB	≤2.0dB	≥55dB	3.0±0.5 μm	Nufern 405HP	1W	FC/APC
	±20nm	0.70mm±0.07mm	150mm	0.78mrad	4.16mm	Φ3.4mm* L14mm	300mm	≤0.5dB	≤2.0dB	≥55dB				
450nm	±20nm	0.26mm±0.02mm	50mm	2.3mrad	1.74mm	Φ3.4mm* L14mm	100mm	≤0.5dB	≤2.0dB	≥55dB	3.5±0.5 μm	Nufern 460HP		
	±20nm	0.68mm±0.06mm	150mm	0.87mrad	4.27mm	Φ3.4mm* L14mm	300mm	≤0.5dB	≤2.0dB	≥55dB				
532nm	±20nm	0.31mm±0.03mm	50mm	2.3mrad	1.79mm	Φ3.4mm* L14mm	100mm	≤0.5dB	≤1.5dB	≥55dB	3.6±0.5 μm			
	±20nm	0.8mm±0.08mm	150mm	0.87mrad	4.40mm	Φ3.4mm* L14mm	300mm	≤0.5dB	≤1.5dB	≥55dB				
635nm	±20nm	0.39mm±0.03mm	50mm	2.6mrad	1.82mm	Φ3.4mm* L14mm	100mm	≤0.5dB	≤1.0dB	≥55dB	4.2±0.5 μm	Nufern 630HP		
	±20nm	0.85mm±0.08mm	150mm	1mrad	4.50mm	Φ3.4mm* L14mm	300mm	≤0.5dB	≤1.0dB	≥55dB				
	±20nm	1.32mm±0.1mm	500mm	0.7mrad	7.07mm	Φ4.0mm* L20mm	1000mm	≤0.5dB	≤1.2dB	≥55dB				
780nm	±20nm	0.39mm±0.03mm	50mm	2.6mrad	1.85mm	Φ3.4mm* L14mm	100mm	≤0.5dB	≤0.9dB	≥55dB	4.5±0.5 μm	Nufern 780HP		
	±20nm	0.99mm±0.09mm	150mm	1mrad	4.57mm	Φ3.4mm* L14mm	300mm	≤0.5dB	≤0.9dB	≥55dB				
	±20nm	1.55mm±0.01mm	500mm	0.7mrad	7.18mm	Φ4.0mm* L20mm	1000mm	≤0.5dB	≤1.2dB	≥55dB				
850nm	±20nm	0.37mm±0.03mm	50mm	3mrad	1.86mm	Φ3.4mm* L14mm	100mm	≤0.35dB	≤0.9dB	≥55dB	5.0±0.5 μm	Nufern 780HP		
	±20nm	0.97mm±0.09mm	150mm	1.1mrad	4.59mm	Φ3.4mm* L14mm	300mm	≤0.35dB	≤0.9dB	≥55dB				
	±20nm	1.51mm±0.01mm	500mm	0.75mrad	7.22mm	Φ4.0mm* L20mm	1000mm	≤0.35dB	≤1.2dB	≥55dB	5.9±0.3 μm	Corning Hi1060		
980nm	±20nm	0.36mm±0.03mm	50mm	3.5mrad	1.88mm	Φ3.4mm* L14mm	100mm	≤0.35dB	≤0.8dB	≥55dB				
	±20nm	0.96mm±0.09mm	150mm	1.4mrad	4.63mm	Φ3.4mm* L14mm	300mm	≤0.35dB	≤0.8dB	≥55dB				
	±20nm	1.48mm±0.1mm	500mm	0.87mrad	7.27mm	Φ4.0mm* L20mm	1000mm	≤0.35dB	≤1.0dB	≥55dB				

Wavelength	Bandwidth	WaistBeam	Beam waist distance	Divergence Angle	EFL	PackageDia.	Working Distance	Output Loss	Insert Loss	Return Loss	MFD	Fiber Type	Max. Power	Connector
1064nm	±20nm	0.37mm±0.03mm	50mm	3.3mrad	1.88mm	Φ3.4mm* L14mm	100mm	≤0.35dB	≤0.8dB	≥55dB	6.2±0.3μm	Corning Hi1060	1W	FC/APC
	±20nm	0.99mm±0.09mm	150mm	1.4mrad	4.64mm	Φ3.4mm* L14mm	300mm	≤0.35dB	≤0.8dB	≥55dB				
	±20nm	1.53mm±0.01mm	500mm	0.87mrad	7.30mm	Φ4.0mm* L20mm	1000mm	≤0.35dB	≤1.0dB	≥55dB				
1310nm	±20nm	0.38mm±0.03mm	50mm	4.4mrad	1.90mm	Φ3.4mm* L14mm	100mm	≤0.25dB	≤0.6dB	≥55dB	9.6±0.4μm			
	±20nm	0.73mm±0.07mm	150mm	2.3mrad	4.68mm	Φ3.4mm* L14mm	300mm	≤0.25dB	≤0.6dB	≥55dB				
	±20nm	0.91mm±0.09mm	500mm	1.9mrad	7.35mm	Φ4.0mm* L20mm	1000mm	≤0.25dB	≤0.8dB	≥55dB				
1550nm	±20nm	0.46mm±0.04mm	50mm	4.5mrad	1.91mm	Φ3.4mm* L14mm	100mm	≤0.25dB	≤0.6dB	≥55dB	10.4±0.5μm	Smf-28e G657A1 G657A2 ZBL	2W	
	±20nm	0.85mm±0.08mm	150mm	2.4mrad	4.71mm	Φ3.4mm* L14mm	300mm	≤0.25dB	≤0.6dB	≥55dB				
	±20nm	1.35mm±0.1mm	500mm	1.7mrad	7.40mm	Φ4.0mm* L20mm	1000mm	≤0.25dB	≤0.8dB	≥55dB				
1650nm	±5nm	0.47mm±0.04mm	50mm	4.5mrad	1.91mm	Φ3.4mm* L14mm	100mm	≤0.25dB	≤0.6dB	≥55dB	10.9±0.5 μm			
	±5nm	0.89mm±0.08mm	150mm	2.4mrad	4.72mm	Φ3.4mm* L14mm	300mm	≤0.25dB	≤0.6dB	≥55dB				
	±5nm	1.22mm±0.01mm	500mm	1.7mrad	7.42mm	Φ4.0mm* L20mm	1000mm	≤0.25dB	≤0.8dB	≥55dB				

Variable Working Distance Range

Wavelength	Bandwidth	WaistBeam	Divergence Angle	EFL	Package Dia.	Working Distance	Output Loss	Insert Loss	Return Loss	MFD	Fiber Type	Max. Power	Connector	
780nm	±20nm	0.9mm±0.09mm	0.95mrad	4.60mm	Φ3.4mm* L14mm	0-350mm	≤0.5dB	≤1.2dB	≥55dB	4.5±0.5μm	Nufern 780HP	1W	FC/APC	
850nm	±20nm	1.0mm±0.1mm	1.05mrad	7.22mm	Φ3.4mm* L14mm	0-350mm	≤0.5dB	≤1.0dB	≥55dB	5.0±0.5μm				
980nm	±20nm	0.99mm±0.09mm	1.26mrad	4.63mm	Φ3.4mm* L14mm	0-350mm	≤0.35dB	≤1.0dB	≥55dB	5.9±0.3μm	Corning Hi1060			
	±20nm	1.54mm±0.15mm	0.81mrad	7.27mm	Φ4.0mm* L20mm	50-1000mm	≤0.35dB	≤1.2dB	≥55dB					
1064nm	±20nm	1.0mm±0.1mm	1.35mrad	4.64mm	Φ3.4mm* L14mm	0-350mm	≤0.35dB	≤1.0dB	≥55dB	6.2±0.3μm				
	±20nm	1.6mm±0.16mm	0.85mrad	7.29mm	Φ4.0mm* L20mm	50-1000mm	≤0.35dB	≤1.2dB	≥55dB					
1310nm	±20nm	0.81mm±0.08mm	2.06mrad	4.68mm	Φ3.4mm* L14mm	0-350mm	≤0.25dB	≤0.8dB	≥55dB	9.6±0.4μm				
	±20nm	1.3mm±0.13mm	1.31mrad	7.35mm	Φ4.0mm* L20mm	50-1000mm	≤0.25dB	≤1.0dB	≥55dB					
1550nm	±20nm	0.9mm±0.09mm	2.15mrad	4.71mm	Φ3.4mm* L14mm	0-350mm	≤0.25dB	≤0.8dB	≥55dB	10.4±0.5μm	Smf-28e/ G657A1/ G657A2Z BL	2W		
	±20nm	1.45mm±0.14mm	1.36mrad	7.40mm	Φ4.0mm* L20mm	50-1000mm	≤0.25dB	≤1.0dB	≥55dB					
1650nm	±20nm	0.96mm±0.09mm	2.19mrad	4.72mm	Φ3.4mm* L14mm	0-350mm	≤0.25dB	≤0.8dB	≥55dB	10.9±0.5μm				
	±20nm	1.50mm±0.15mm	1.40mrad	7.42mm	Φ4.0mm* L20mm	50-1000mm	≤0.25dB	≤1.0dB	≥55dB					



5. Polarization-Maintainin Fiber Collimators

It is assembled precisely by PM fiber pigtail and a Grin lens or C-Lens.which can convert the divergent light into a parallel beam (Gaussian beam)from fiber export , or couple space parallel light into the fiber. It can be used singly to achieve a specified beam size at the required position, or paired with other optical components such as filters and isolators in between two collimators to meet specific customer needs.



Fixed Working Distance

Wavelength	Bandwidth	WaistBeam	Beam waist distance	Divergence Angle	EFL	Package	ExtinctionRatio	Working Distance	Output Loss	Return Loss	MFD	Fiber Type	Connector		
633nm	±20nm	0.39mm±10%	50mm	2.6mrad	1.82mm	Φ3.4mm*L14mm	≥20dB	100mm	≤0.5dB	≥55dB	4.5±0.5 μm	Nufern PM630	FC/APC		
	±20nm	0.85mm±10%	150mm	1.0mrad	4.50mm	Φ3.4mm*L14mm	≥20dB	300mm	≤0.5dB	≥55dB					
	±20nm	1.32mm±10%	500mm	0.7mrad	7.06mm	Φ4.0mm*L20mm	≥20dB	1000nm	≤0.5dB	≥55dB					
780nm	±20nm	0.41mm±10%	50mm	2.4mrad	1.85mm	Φ3.4mm*L14mm	≥20dB	100mm	≤0.5dB	≥55dB	5.2±1.0 μm	Nufern PM780			
	±20nm	0.75mm±10%	150mm	1.3mrad	4.57mm	Φ3.4mm*L14mm	≥20dB	300mm	≤0.5dB	≥55dB					
	±20nm	1.55mm±10%	500mm	0.7mrad	7.18mm	Φ4.0mm*L20mm	≥20dB	1000mm	≤0.5dB	≥55dB					
850nm	±20nm	0.37mm±10%	50mm	3.0mrad	1.86mm	Φ3.4mm*L14mm	≥20dB	100mm	≤0.5dB	≥55dB					
	±20nm	0.97mm±10%	150mm	1.1mrad	4.59mm	Φ3.4mm*L14mm	≥20dB	300mm	≤0.5dB	≥55dB					
	±20nm	1.51mm±10%	500mm	0.75mrad	7.22mm	Φ4.0mm*L20mm	≥20dB	1000mm	≤0.5dB	≥55dB					
980nm	±20nm	0.50mm±10%	50mm	2.5mrad	1.88mm	Φ3.4mm*L14mm	≥20dB	100mm	≤0.35dB	≥55dB	6.6±0.5 μm	Nufern PM980			
	±20nm	0.96mm±10%	150mm	1.3mrad	4.63mm	Φ3.4mm*L14mm	≥20dB	300mm	≤0.35dB	≥55dB					
	±20nm	1.48mm±10%	500mm	0.87mrad	7.27mm	Φ4.0mm*L20mm	≥20dB	1000mm	≤0.35dB	≥55dB					
1064nm	±20nm	0.51mm±10%	50mm	2.7mrad	1.88mm	Φ3.4mm*L14mm	≥20dB	100mm	≤0.35dB	≥55dB					
	±20nm	0.9mm±10%	150mm	1.5mrad	4.64mm	Φ3.4mm*L14mm	≥20dB	300mm	≤0.35dB	≥55dB					
	±20nm	1.43mm±10%	500mm	0.95mrad	7.3mm	Φ4.0mm*L20mm	≥20dB	500mm	≤0.35dB	≥55dB					
1310nm	±20nm	0.4mm±10%	50mm	4.2mrad	1.90mm	Φ3.4mm*L14mm	≥20dB	100mm	≤0.35dB	≥55dB	9.3±0.5 μm	Corning PM1300			
	±20nm	0.8mm±10%	150mm	2.1mrad	4.68mm	Φ3.4mm*L14mm	≥20dB	300mm	≤0.35dB	≥55dB					
	±20nm	1.2mm±10%	500mm	1.4mrad	7.35mm	Φ4.0mm*L20mm	≥20dB	1000mm	≤0.35dB	≥55dB					

1550nm	±20nm	0.45mm±10%	50mm	4.4mrad	1.91mm	Φ3.4mm*L14mm	≥20dB	100mm	≤0.35dB	≥55dB	10.1±0.5 μm	Corning PM1550	FC/APC
	±20nm	0.86mm±10%	150mm	2.3mrad	4.71mm	Φ3.4mm*L14mm	≥20dB	300mm	≤0.35dB	≥55dB			
	±20nm	1.3mm±10%	500mm	1.5mrad	7.40mm	Φ4.0mm*L20mm	≥20dB	1000mm	≤0.35dB	≥55dB			

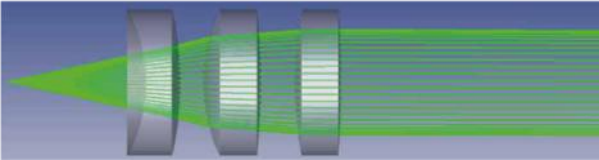
Variable Working Distance Range

Wavelength	Bandwidth	WaistBeam	Divergence Angle	EFL	Package	Extinction Ratio	Working Distance	Output Loss	Return Loss	MFD	Fiber Type	Connector
633nm	≥18dB	0.39mm±10%	2.6mrad	1.82mm	Φ3.4mm*L14mm	±20nm	0-100mm	≤0.5dB	≥55dB	4.5±0.5μm	PM630-HP	FC/APC
780nm	≥18dB	0.39mm±10%	2.6mrad	1.85mm	Φ3.4mm*L14mm	±20nm	0-100mm	≤0.5dB	≥55dB	5.2±1.0μm	PM780-HP	
	≥18dB	1.05mm±10%	0.95mrad	4.57mm	Φ3.4mm*L14mm	±20nm	0-350mm	≤0.5dB	≥55dB			
850nm	≥18dB	0.37mm±10%	3.0mrad	1.86mm	Φ3.4mm*L14mm	±20nm	0-100mm	≤0.5dB	≥55dB			
	≥18dB	1.02mm±10%	1.05mrad	4.59mm	Φ3.4mm*L14mm	±20nm	0-350mm	≤0.5dB	≥55dB			
980nm	≥20dB	0.99mm±10%	1.26mrad	4.63mm	Φ3.4mm*L14mm	±20nm	0-350mm	≤0.35dB	≥55dB	6.6±0.5μm	PM980-XP	
	≥20dB	1.54mm±10%	0.81mrad	7.27mm	Φ4.0mm*L20mm	±20nm	50-850mm	≤0.35dB	≥55dB			
1064nm	≥20dB	1.0mm±10%	1.35mrad	4.64mm	Φ3.4mm*L14mm	±20nm	0-350mm	≤0.35dB	≥55dB			
	≥20dB	1.6mm±10%	0.85mrad	7.30mm	Φ4.0mm*L20mm	±20nm	50-850mm	≤0.35dB	≥55dB			
1310nm	≥20dB	0.81mm±10%	2.06mrad	4.68mm	Φ3.4mm*L14mm	±20nm	0-350mm	≤0.35dB	≥55dB	9.3±0.5μm	PM1300-XP	
	≥20dB	1.27mm±10%	1.31mrad	7.35mm	Φ4.0mm*L20mm	±20nm	50-850mm	≤0.35dB	≥55dB			
1550nm	≥20dB	0.92mm±10%	2.15mrad	4.71mm	Φ3.4mm*L14mm	±20nm	0-350mm	≤0.35dB	≥55dB	10.1±0.5μm	PM1550-XP	
	≥20dB	1.45mm±10%	1.36mrad	7.40mm	Φ4.0mm*L20mm	±20nm	50-850mm	≤0.35dB	≥55dB			

- The extinction ratio is not calculated with the connector included. After adding the connector, the extinction ratio decreases by 2dB.
- The output loss is not calculated for the connector. After adding the connector, the output loss increases by 0.15dB (Not considering Flange Insertion Loss).

6. Achromatic Lenses Collimators

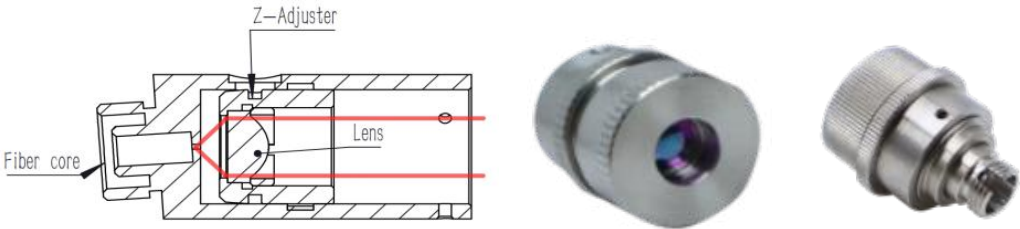
Achromatic Lenses Collimators are composed kits of high numerical aperture lenses, suitable for NA.22 multimode fibers. It can shape and collimate the light beam emitted from multimode fibers, as well as efficiently couple spatial light into multimode fibers. The optical design includes chromatic aberration and image aberration correction, making the collimator focal length insensitive to wavelength bandwidth. Each optical surface of the lens system is coated with anti-reflection film to minimize surface reflection.



- All testing data for beam size and divergence angle are obtained by connecting the standard jumpers from Rays optics.
- Also applicable for polarization maintaining fiber with corresponding wavelength.
- Non-magnetic material housing (NJSSPEEK-1000) can be customized.

7 . Adjustable Focus Collimators

An adjustable focus collimator is an optical component that dynamically adjusts the focusing/collimation state of the output beam. Its core function is to convert divergent light (such as the output light of a laser diode) into a collimated beam with adjustable "spot size - working distance" as needed, or to realize the forward and backward movement of the focal point within a specific range.



EFL	Typical Beam Size	Lens - Fiber Adjustment ap	Far - Field Divergence Angle	EFL@ λ	AR Coating	Package (Max. Length)	Lens NA	Input Fiber MFD	Transmittance	Max. Power	Connector
4.5mm	0.86mm±10%	2.4 - 4.9 mm	0.78mrad	4.40mm	400~700nm R<0.5%	Φ15.5mm*L20	0.54	3.5μm	≥95%	1W/mm2	FC/APC FC/PC
	0.98mm±10%	2.4 - 4.9 mm	1.10mrad	4.53mm	600~1050nm R<0.5%	Φ15.5mm*L20	0.54	5μm			
	0.87mm±10%	2.4 - 4.9 mm	2.30mrad	4.61mm	1050~1700nm R<0.5%	Φ15.5mm*L20	0.54	10.4μm			
7.5mm	1.35mm±10%	4.2- 6.8 mm	0.49mrad	7.32mm	400~700nm R<0.5%	Φ15.5mm*L20	0.3	3.5μm			
	1.6mm±10%	4.2- 6.8 mm	0.66mrad	7.53mm	600~1050nm R<0.5%	Φ15.5mm*L20	0.3	5μm			
	1.44mm±10%	4.2- 6.8 mm	1.40mrad	7.67mm	1050~1700nm R<0.5%	Φ15.5mm*L20	0.3	10.4μm			
11 mm	1.96mm±10%	8.6 - 10.9 mm	0.32mrad	10.89mm	400~700nm R<0.5%	Φ15.5mm*L20	0.3	3.5μm			
	2.35mm±10%	8.6 - 10.9 mm	0.46mrad	11.11mm	600~1050nm R<0.5%	Φ15.5mm*L20	0.3	5μm			
	2.1mm±10%	8.6 - 10.9 mm	1.00mrad	11.31mm	1050~1700nm R<0.5%	Φ15.5mm*L20	0.3	10.4μm			



8. Fiber Port Collimators

When the connector and the fiber remain stationary, the interal lens has five alignment degrees of freedom: linealignment in the X and Y directions, pitch and yaw alignment angles, and adjustment of the Z-axis using both pitch and yaw. The travel range in the X and Y directions is +0.7 mm, the travel range in the Z direction is greater than 2 mm, andthe pitch and yaw adjustment range is +4°. It has good structural stability and high coupling efficiency. If the wavelengthof the light source is changed, the collimator needs to be re-adjusted to achieve higher coupling efficiency.



Achromatic Lenses

Specifications	Typical Beam Size	Far - Field Divergence Angle	EFL	AR Coating	Lens NA	Package	Input Fiber Type	Transmittance	Max. Power	Connector
RWX-VIS-F7.5	1.23 mm±10%	0.47mrad	7.50 mm	R<0.5%@350 - 700 nm	0.3	L38mm*W28.5mm	3.5μm	≥95%	2W/mm2	FC/APC FC/PC
RWX-NIR-F7.5	1.62 mm±10%	0.67mrad	7.50 mm	R<0.5%@600 - 1050 nm	0.3	L38mm*W28.5mm	5μm			
RWX-SWIR-F7.5	1.42 mm±10%	1.39mrad	7.50 mm	R<0.5%@1050 - 1650 nm	0.3	L38mm*W28.5mm	10.4μm			
RWX-VIS-F10	1.64 mm±10%	0.35mrad	10.0 mm	R<0.5%@350 - 700 nm	0.23	L38mm*W28.5mm	3.5μm			
RWX-NIR-F10	2.16 mm±10%	0.50mrad	10.0 mm	R<0.5%@600 - 1050 nm	0.23	L38mm*W28.5mm	5μm			
RWX-SWIR-F10	1.99 mm±10%	0.99mrad	10.0 mm	R<0.5%@1050 - 1650 nm	0.23	L38mm*W28.5mm	10.4μm			

Aspheric Lenses

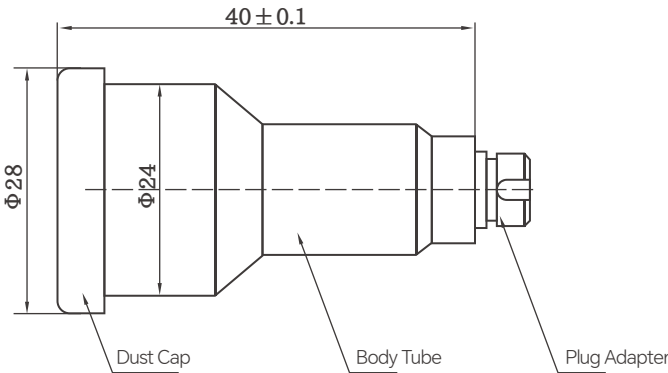
Specifications	Typical Beam Size	Far - Field Divergence Angle	EFL	AR Coating	Lens NA	Package	Input Fiber Type	Transmittance	Max. Power	Connector
RWF-VIS-F4.6	0.75 mm±10%	0.76mrad	4.60mm	R<0.5%@350 - 700 nm	0.52	L38mm*W28.5mm	3.5μm	≥95%	2W/mm2	FC/APC FC/PC
RWF-NIR-F4.6	1.0 mm±10%	1.09mrad	4.60mm	R<0.5%@600 - 1050 nm	0.52	L38mm*W28.5mm	5μm			
RWF-SWIR-F4.6	0.87 mm±10%	2.26mrad	4.60mm	R<0.5%@1050 - 1650 nm	0.52	L38mm*W28.5mm	10.4μm			
RWF-VIS-F7.5	1.23 mm±10%	0.47mrad	7.50 mm	R<0.5%@350 - 700 nm	0.3	L38mm*W28.5mm	3.5μm			
RWF-NIR-F7.5	1.62 mm±10%	0.67mrad	7.50 mm	R<0.5%@600 - 1050 nm	0.3	L38mm*W28.5mm	5μm			
RWF-SWIR-F7.5	1.42 mm±10%	1.39mrad	7.50 mm	R<0.5%@1050 - 1650 nm	0.3	L38mm*W28.5mm	10.4μm			
RWF-VIS-F11	1.80 mm±10%	0.32mrad	11.0 mm	R<0.5%@350 - 700 nm	0.2	L38mm*W28.5mm	3.5μm			
RWF-NIR-F11	2.38 mm±10%	0.46mrad	11.0 mm	R<0.5%@600 - 1050 nm	0.2	L38mm*W28.5mm	5μm			
RWF-SWIR-F11	2.09 mm±10%	0.95mrad	11.0 mm	R<0.5%@1050 - 1650 nm	0.2	L38mm*W28.5mm	10.4μm			

- All testing data for beam size and divergence angle are obtained by connecting the standard jumpers from Rays optics.
- Waist beam size: calculated using the theory of single-mode optical fiber for each wavelength, taken at the 1/e²i intensity point of the Gaussian beam.

9. Large Beam Collimators

By using an air gap bonded lens, it can provide better beam quality than aspherical lenses and achromatic lenses in terms of collimation performance.

The design of a low-aberration lens group can achieve a beam closer to a Gaussian beam, with a smaller divergence angles and smaller wavefront errors.



SM LARGE BEAM COLLIMATORS

Wavelength	Bandwidth	Waist Beam	Divergence Angle	EFL	NA (Lens)	Package Dia.	Fiber Type	Connector	Transmittance
405nm	±30nm	5.3mm	0.16mrad	33.2 mm	0.27	Φ24mm	405HP	FC/PC FC/APC Sma905	>92%
450nm	±30nm	5.8mm	0.12mrad	33.5 mm	0.26	Φ24mm	460HP		
525nm	±30nm	6.3mm	0.10mrad	34.3 mm	0.26	Φ24mm			
635nm	±30nm	7.0mm	0.12mrad	35.3 mm	0.25	Φ24mm	630HP		
780nm	±30nm	7.4mm	0.14mrad	36.0 mm	0.25	Φ24mm	780HP		
850nm	±30nm	7.8mm	0.14mrad	36.2 mm	0.25	Φ24mm			
905nm	±30nm	7.5mm	0.15mrad	36.3mm	0.25	Φ24mm			
980nm	±30nm	8.5mm	0.16mrad	36.4 mm	0.25	Φ24mm	980HP		
1064nm	±30nm	7.9mm	0.17mrad	36.6 mm	0.25	Φ24mm			
1310nm	±30nm	6.6mm	0.24mrad	36.7 mm	0.24	Φ24mm	Smf-28e		
1550nm	±30nm	6.9mm	0.28mrad	37.1 mm	0.24	Φ24mm			
1654nm	±10nm	6.9mm	0.30mrad	37.2mm	0.24	Φ24mm			



MM LARGE BEAM COLLIMATORS

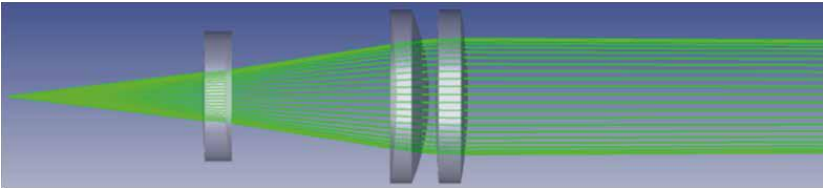
Wavelength	Bandwidth	Waist Beam	Divergence Angle	EFL	NA(Lens)	Pakage Dia.	Fiber Type	Connector	Transmittance
450nm	±30nm	18.0mm	2.3mrad	33.5 mm	0.27	Φ24mm	62.5/125	FC/PC Sma905	>92%
	±30nm	14.6mm	6.5mrad	33.5 mm	0.27	Φ24mm	200/220		
	±30nm	14.6mm	12.5mrad	33.5 mm	0.27	Φ24mm	400/440		
485nm	±30nm	15.0mm	4.0mrad	34.1mm	0.27	Φ24mm	105/125		
	±30nm	15.0mm	7.0mrad	34.1mm	0.27	Φ24mm	200/220		
	±30nm	15.4mm	12.8mrad	34.1mm	0.27	Φ24mm	400/440		
525nm	±30nm	18.2mm	2.2mrad	34.3 mm	0.27	Φ24mm	62.5/125		
	±30nm	14.9mm	3.5mrad	34.3 mm	0.27	Φ24mm	105/125		
	±30nm	14.9mm	6.2mrad	34.3 mm	0.27	Φ24mm	200/220		
	±30nm	15.2mm	12.6mrad	34.3 mm	0.27	Φ24mm	400/440		
635nm	±30nm	18.8mm	2.8mrad	35.3 mm	0.26	Φ24mm	62.5/125		
	±30nm	15.2mm	4.0mrad	35.3 mm	0.26	Φ24mm	105/125		
	±30nm	15.3mm	6.1mrad	35.3 mm	0.26	Φ24mm	200/220		
	±30nm	15.4mm	11.8mrad	35.3 mm	0.26	Φ24mm	400/440		
780nm	±30nm	19.0mm	2.7mrad	36.0 mm	0.26	Φ24mm	62.5/125		
	±30nm	15.6mm	3.1mrad	36.0 mm	0.26	Φ24mm	105/220		
	±30nm	15.5mm	5.9mrad	36.0 mm	0.26	Φ24mm	200/220		
	±30nm	15.5mm	11.6mrad	36.0 mm	0.26	Φ24mm	400/440		
850nm	±30nm	19.1mm	2.7mrad	36.2 mm	0.26	Φ24mm	62.5/125		
	±30nm	15.6mm	3.2mrad	36.2 mm	0.26	Φ24mm	105/220		
	±30nm	15.6mm	5.8mrad	36.2 mm	0.26	Φ24mm	200/220		
	±30nm	15.6mm	11.4mrad	36.2 mm	0.26	Φ24mm	400/440		
905nm	±30nm	15.7mm	3.3mrad	36.3 mm	0.26	Φ24mm	105/220		
	±30nm	15.7mm	5.9mrad	36.3 mm	0.26	Φ24mm	200/220		
	±30nm	19.4mm	2.4mrad	36.6 mm	0.26	Φ24mm	62.5/125		
1064nm	±30nm	15.8mm	3.4mrad	36.6 mm	0.26	Φ24mm	105/125		
	±30nm	16.0mm	6.4mrad	36.6 mm	0.26	Φ24mm	200/220		
	±30nm	16.0mm	12.2mrad	36.6 mm	0.26	Φ24mm	400/440		
1310nm	±30nm	19.4mm	2.3mrad	36.7 mm	0.25	Φ24mm	62.5/125		
	±30nm	15.8mm	3.5mrad	36.7 mm	0.25	Φ24mm	105/125		
	±30nm	15.8mm	6.1mrad	36.7 mm	0.25	Φ24mm	200/220		
	±30nm	15.9mm	11.6mrad	36.7 mm	0.25	Φ24mm	400/440		

1550nm	±30nm	19.4mm	2.1mrad	37.1 mm	0.25	Φ24mm	62.5/125	FC/PC Sma905	>92%
	±30nm	15.9mm	3.4mrad	37.1 mm	0.25	Φ24mm	105/125		
	±30nm	15.9mm	6.1mrad	37.1 mm	0.25	Φ24mm	200/220		
	±30nm	16.0mm	11.6mrad	37.1 mm	0.25	Φ24mm	400/440		

- All testing data for beam size and divergence angle are obtained by connecting the standard jumpers from Rays optics.
- Also applicable for polarization maintaining fiber with corresponding wavelength.
Waist beam diameter: Take the Gaussian beam at 1/e2 and use the theoretical calculated values for each wavelength using single-mode fibers.
- Beam far-field divergence angle: The input uses single-mode optical fibers with various wavelengths, calculated according to the Gaussian beam 1/e2 theory. Tolerance is +0.003°/0.0°.

10. Long Distance Collimators

The fiber optic beam can be collimated and shaped for different lasers output through fiber optic connections, providing diffraction-limited performance at the design wavelength, with a collimation distance of up to 200 meters. The structure of this series of collimators is compact. Aberration correction is performed during design by selecting an air-spaced doublet lens series, which has an excellent collimation effect and the ability to couple the space lights. The effective focal length of the doublet lens depends on the wavelength. Therefore, this series of collimators should be used at the design wavelength for optimal performance.





Long Distance Collimator For 100M

Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Fiber Type	Transmittance	Connector
405nm	±30nm	10.2mm±10%	0.09mrad	66.5mm	Φ31.5mm*L45±1mm	0.19	Nufen 405HP	≥92%	FC/APC FC/PC
450nm	±30nm	13.7mm±10%	0.07mrad	68.4mm	Φ31.5mm*L45±1mm	0.18	Nufen 460HP		
520nm	±30nm	14.2mm±10%	0.06mrad	70.3mm	Φ31.5mm*L45±1mm	0.18			
635nm	±30nm	14.5mm±10%	0.07mrad	72.1mm	Φ31.5mm*L45±1mm	0.17	Nufen 630HP		
780nm	±30nm	14.2mm±10%	0.07mrad	73.3mm	Φ31.5mm*L50±1mm	0.17	Nufen 780HP		
850nm	±30nm	14.9mm±10%	0.07mrad	73.7mm	Φ31.5mm*L50±1mm	0.17			
905nm	±30nm	14.9mm±10%	0.07mrad	73.9mm	Φ31.5mm*L50±1mm	0.17			
980nm	±30nm	15.0mm±10%	0.09mrad	74.2mm	Φ31.5mm*L50±1mm	0.17	Corning Hi1060		
1064nm	±30nm	15.2mm±10%	0.09mrad	74.5mm	Φ31.5mm*L50±1mm	0.17			
1310nm	±30nm	12.9mm±10%	0.12mrad	75.1mm	Φ31.5mm*L50±1mm	0.17	Corning Smf-28e		
1550nm	±30nm	14.2mm±10%	0.14mrad	75.6mm	Φ31.5mm*L50±1mm	0.17			
1650nm	±30nm	14.5mm±10%	0.14mrad	76.0mm	Φ31.5mm*L50±1mm	0.17			

Ultra-Long-Range Collimator

Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Fiber Type	Transmittance	Connector
450nm	±30nm	58.1mm±10%	0.015(+0.03/-0) mrad	300 mm	Φ90mm*L411±2mm	0.16	Nufern 460HP	≥90%	FC/APC FC/PC
520nm	±30nm	58 mm±10%	0.015(+0.03/-0) mrad	306.8 mm	Φ90mm*L411±2mm	0.16			
635nm	±30nm	62.6 mm±10%	0.016(+0.03/-0) mrad	309.6 mm	Φ90mm*L418±2mm	0.16	Nufern 630HP		
780nm	±30nm	67.3 mm±10%	0.018(+0.03/-0) mrad	310.6 mm	Φ90mm*L418±2mm	0.16	Nufern 780HP		
850nm	±30nm	67.6 mm±10%	0.019(+0.03/-0) mrad	312.4 mm	Φ90mm*L418±2mm	0.16			
980nm	±30nm	65.2 mm±10%	0.02(+0.03/-0) mrad	315.2 mm	Φ90mm*L422±2mm	0.15	Corning Hi1060		
1064nm	±30nm	68.6 mm±10%	0.023(+0.03/-0) mrad	314.2 mm	Φ90mm*L422±2mm	0.15			
1310nm	±30nm	57.5 mm±10%	0.03(+0.03/-0) mrad	315.89 mm	Φ90mm*L422±2mm	0.15	Corning Smf-28e		
1550nm	±30nm	60.5 mm±10%	0.034(+0.03/-0) mrad	317.54 mm	Φ90mm*L422±2mm	0.15			

Long Distance Collimator For 300M

Wavelength	Bandwidth	Output Beam Size	Divergence Angle	EFL	Package	NA	Fiber Type	Transmittance	Connector
405nm	±30nm	23.36mm±10%	0.057+0.03 mrad	136.0 mm	Φ58mm*L145mm	0.18	405HP	≥90%	FC/APC FC/PC
450nm	±30nm	22.89mm±10%	0.048+0.03 mrad	139.9 mm	Φ58mm*L145mm	0.17	460HP		
520nm	±30nm	27.2mm±10%	0.045+0.03 mrad	143.8 mm	Φ58mm*L150mm	0.17			
635nm	±30nm	29.8mm±10%	0.043+0.03 mrad	147.5 mm	Φ58mm*L150mm	0.17	630HP		
780nm	±30nm	29.79mm±10%	0.045+0.03 mrad	150.0mm	Φ58mm*L157mm	0.16	780HP		
850nm	±30nm	32.62mm±10%	0.046+0.03 mrad	150.8 mm	Φ58mm*L157mm	0.16			
905nm	±30nm	34.8mm±10%	0.048+0.03 mrad	151.2 mm	Φ58mm*L157mm	0.16			
980nm	±30nm	31.56mm±10%	0.049+0.03 mrad	151.8 mm	Φ58mm*L157mm	0.16	Hi1060		
1064nm	±30nm	34.38mm±10%	0.050+0.03 mrad	152.3 mm	Φ58mm*L160mm	0.16			
1310nm	±30nm	27.8mm±10%	0.065+0.03 mrad	153.3 mm	Φ58mm*L160mm	0.16	Smf-28e		
1550nm	±30nm	29.2mm±10%	0.072+0.03 mrad	154.0 mm	Φ58mm*L160mm	0.16			
1654nm	±30nm	30.02mm±10%	0.075+0.03 mrad	154.2mm	Φ58mm*L160mm	0.16			

