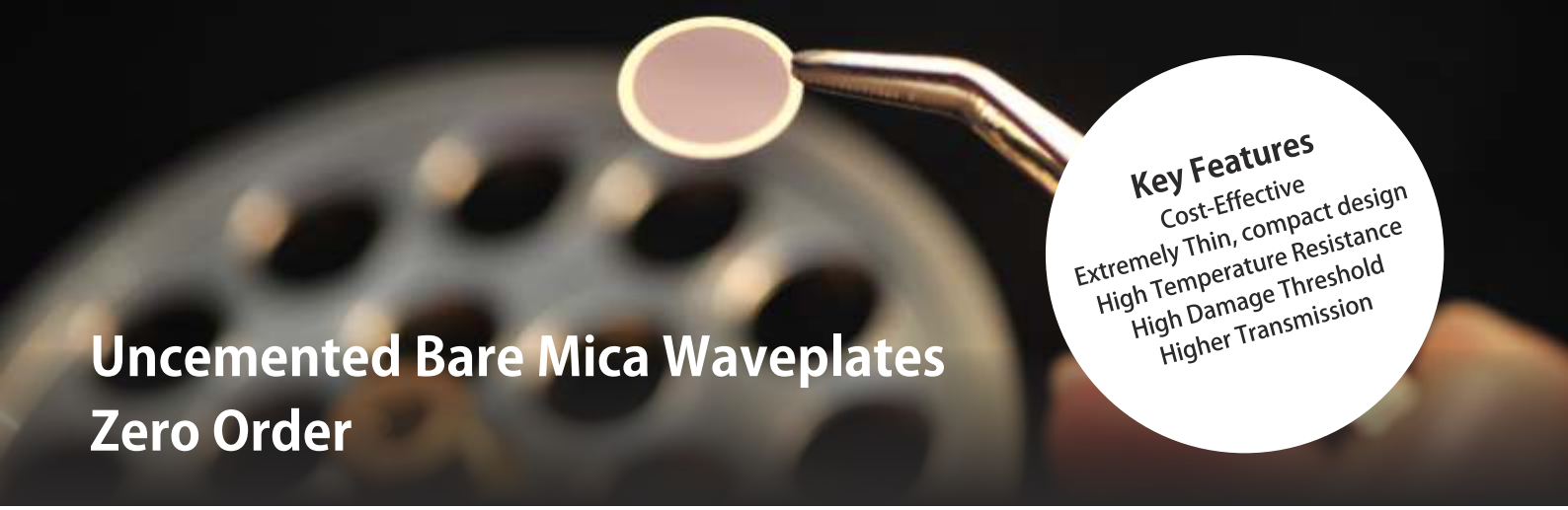


Uncemented Bare Mica Waveplates Zero Order

Key Features
Cost-Effective
Extremely Thin, compact design
High Temperature Resistance
High Damage Threshold
Higher Transmission

Uncemented bare mica waveplates are recommended for higher power applications. Application areas are imaging systems, metrology, material processing, medical technology, lasers, detection schemes, research & development and special lighting technologies.

Mica waveplates are available at any specified wavelength from 350 to 3.000 nm.
Indicator dots are marked on the front surface to identify crystal optical axis.

SPECIFICATIONS:

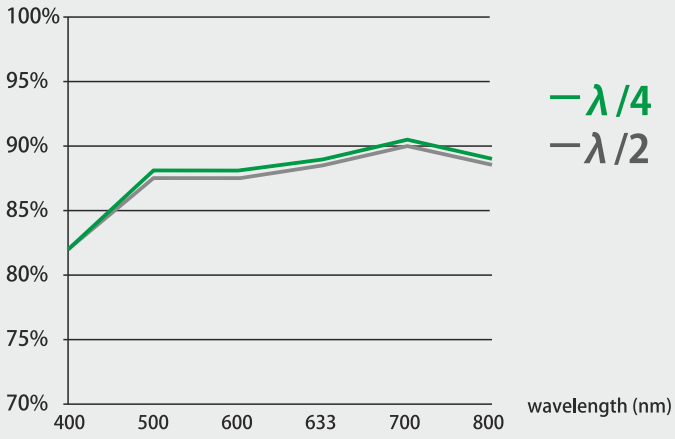
Beam Deviation:	10 Arc Seconds
Wavefront:	λ/10 @ 633 nm
Clear Aperture:	≥ 85 % of central diameter
Substrate Material:	Muscovite Mica
Surface Quality:	≤ 40-20 scratch dig
Diameter:	Ø + 0/ -0,10mm
Retardation Tolerance:	λ/20 - λ/300 (wavelength-dependent)
Damage Threshold:	58J/cm², 11ns, 100Hz @ 1064nm (test result)

- Standard sizes are similar to Broadband Listing
- λ/8 and other retardation values available
- Custom sizes and shapes from 5 to 50 mm (200 mm)
- AR coatings for enhanced transmission available upon request
- Ring mounting options available upon request

Laser Lines (wavelength-nm)

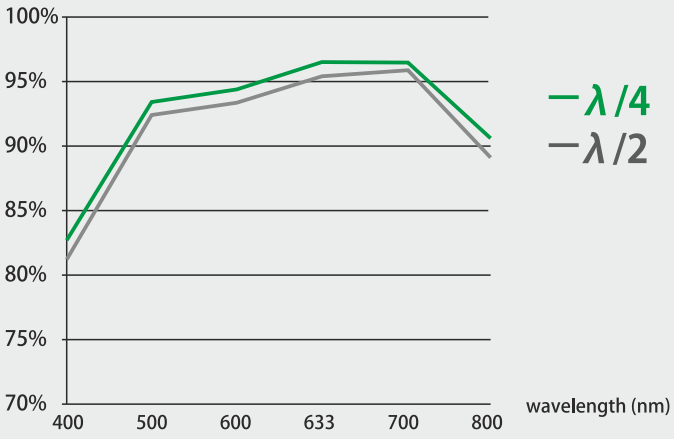
442 - 515 - 543 - 633 - 780 - 850 - 1064 - 1510
448 - 532 - 589 - 670 - 830 - 904 - 1300 - 1.550

Typical transmission of uncoated , uncemented bare mica waveplates (test result)



Remark: Base raw-material and thickness has a significant impact on transmission.

Typical transmission of BBAR coated, uncemented bare mica waveplates (test result)



Remark: Base raw-material and thickness has a significant impact on transmission.

Product Code

Wavelength Range (nm)	Retardation	Outside Diameter (mm)	Part Number
350-3.000	λ / 4	5 - 200	MCXXXX4XX
350-3.000	λ / 2	5 - 200	MCXXXX2XX

Please specify dimension, wavelength and retardation tolerance

Technical Notes - Mica Retarders

General Information

Mica is a naturally occurring birefringent biaxial crystal. It's cleaved into precisely controlled wafer thicknesses to produce optical retarders at user-specified wavelengths.
Due to its natural cleavage, mica is suitable to produce accurate zero-order retarders at a much lower cost than any other base material. Mica waveplates can be used over a fairly broad wavelength range. For example a 5% change of wavelength results in only 0,6% transmittance of light with incorrect polarisation.
The mica sheet is extremely thin so in most cases it's laminated between protective glass discs for easy handling. Antireflection coatings for laminated and bare mica plates enhance transmission. Requested ring mount options enable system integration.

Absorption/Dispersion/Path difference/Birefringence

Mica is transparent in the region of about 350 nm to 6 µm, but not free of absorption.
Mica retarders are zero-order devices and show low dispersion and angular sensitivity and can be uniform retardance across the aperture.
The path difference of mica (Retardance expressed in nm) is nearly constant with wavelength. Consequently a quarter-waveplate for 1064 nm has 266 nm path-difference and is also a half- waveplate at 532 nm.
The birefringence of Mica is about 0,0054. Tilt of plane can be used to tune Retardance either upwards or downwards, depending as rotation is about the fast or slow axis. The effect is nearly quadrant with angle. Consequently a 10° tilt causing about 9% change in Retardance.

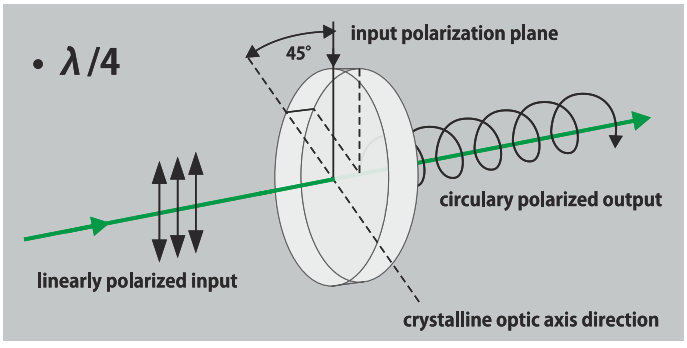
Principle / Application - λ/4 Waveplate

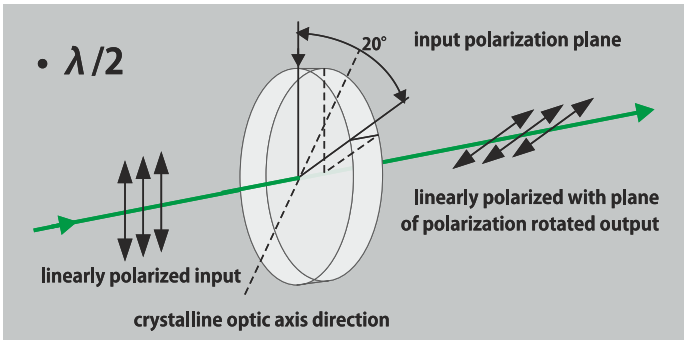
Mica quarter-waveplates creates a quarter-wavelength phase shift ($\pi/2$, 90°) and convert linear polarization to circular polarization and vice versa. They are often used with a linear polarizer to form an isolator, blocking light reflected from other surfaces (ellipsometry, optical pumping, isolation).

Principle / Application - λ/2 Waveplate

Mica half-waveplates retards one polarization by half a wavelength, or 180 degrees (π, 180°).
These types convert the direction of linear polarization in 90°. Consequently, they can be used as continuously adjustable polarization rotators. They are used in rotating the plane of polarization, electro optical modulation and as a vario-ratio beamsplitter when used combined with a polarization cube.

Schematic





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