

Precision Retarders

PROBLEM

“My laser center wavelength varies by a few nanometers, but I need my retarder to be a nearly perfect quarter-wave of retardance for each wavelength in order to give maximum isolation. I’ll go broke if I have to purchase 10 retarders spaced at 0.5 nm intervals. Is there another way?”

SOLUTION

0.5 nanometers exceeds even our tight tolerance on retardance! Try angle tuning your retarder. A 10° tilt can change the retardance by about 1.25 nm or 0.002 waves of retardance at 632.8 nm. Remember to tilt about the fast or slow axis of your retarder, likely at ±45° to your optical bench. See our Application Note about retarders at www.meadowlark.com.

Another solution is to use a liquid crystal variable retarder, page 48.

PROBLEM

“I purchased a compound zero-order retarder for use in an imaging system where I need a good field of view. Do these really have the field of view of a true zero-order retarder?”

SOLUTION

This is a common misconception. In fact, compound zero-order retarders are twice as bad as the multi-order retarders they are made from! If you need a good field of view, you must use a true zero-order retarder. See our Application Note at www.meadowlark.com.

SPECIFICATIONS	
Retarder Material	Birefringent Polymer
Substrate Material	BK 7 Grade A, fine annealed
Standard Wavelengths	532, 632.8, 670, 780, 850, 1064 and 1550 nm
Custom Wavelengths	400-1800 nm (specify)
Standard Retardances	$\lambda/4$ and $\lambda/2$
Retardance Accuracy	$\leq \lambda/350$
Transmitted Wavefront Distortion (at 632.8 nm)	$\leq \lambda/5$
Surface Quality	40-20 scratch and dig
Beam Deviation	≤ 1 arc min
Reflectance (per surface)	$\leq 0.5\%$ at normal incidence
Diameter Tolerance	
Mounted	± 0.005 in.
Unmounted	$+0/-0.010$ in.
Thickness Tolerance	± 0.020 in.
Temperature Range	20° C to 50° C
Recommended Safe Operating Limit	500 W/cm ² , CW 600 mJ/cm ² , 20 ns, visible 4 J/cm ² , 20 ns, 1064 nm
Custom retardance values and sizes are available. Please call for a quote.	

ORDERING INFORMATION				
Mounted				
Diameter (in.)	Clear Aperture (in.)	Thickness (in.)	$\lambda/4$ Wave Part No.	$\lambda/2$ Wave Part No.
1.00	0.40	0.25	NQM-050- λ	NHM-050- λ
1.00	0.70	0.35	NQM-100- λ	NHM-100- λ
2.00	1.20	0.50	NQM-200- λ	NHM-200- λ
Unmounted				
Diameter (in.)	Clear Aperture (in.)	Thickness (in.)	$\lambda/4$ Wave Part No.	$\lambda/2$ Wave Part No.
0.50	0.40	0.13	NQ-050- λ	NH-050- λ
1.00	0.80	0.26	NQ-100- λ	NH-100- λ
2.00	1.60	0.51	NQ-200- λ	NH-200- λ
Please specify your center wavelength λ in nanometers when ordering.				

Custom size retarders with improved transmitted wavefront distortion and/or beam deviation are available. Your requirements for custom shapes and sizes are also welcome. Please call for a quote.

Meadowlark Optics one and two inch diameter retarders conveniently fit our Rotary Mounts. Please refer to page 43 for more information.