PhotonEdge

Precision Optical Components

Air Spaced Wave Plate

Product Datasheet | Quartz Crystalline | lambda/4 & lambda/2 Retardation | High Power Handling

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1. Product Overview

PhotonEdge Air Spaced Wave Plates are precision optical components designed for high-power laser applications. These wave plates feature an air gap between two crystalline quartz plates, eliminating cement-related thermal effects and offering significantly higher damage threshold than cemented wave plates.

Our air spaced wave plates are available in both 1/4 wave (90 deg phase retardation) and 1/2 wave (180 deg phase retardation) configurations, covering wavelengths from 266nm to 1550nm. Each unit is precision-polished to lambda/10 surface flatness and features multi-layer anti-reflection (AR) coatings on all 4 surfaces.

Air-spaced construction provides the highest damage threshold (> 50 J/cm^2), eliminating cement thermal effects, making it ideal for high-power pulsed lasers, industrial cutting, and scientific amplification systems.

2. Technical Specifications

Parameter	Specification
Material	Crystalline Quartz (SiO2)
Construction	Air-spaced (two quartz plates)
Type	1/4lambda (90 deg) or 1/2lambda (180 deg)
Wavelength Range	266nm - 1550nm (see standard models)
Diameter Tolerance	+0.0 / -0.1mm
Thickness Tolerance	+/-0.2mm
Surface Flatness	lambda/10 @ 632.8nm
Surface Quality	40-20 Scratch-Dig
Optical Axis	< 10 arcsec
Clear Aperture	> 85% of central diameter
Retardation Tolerance	lambda/300
Wavefront Distortion	lambda/4 @ 632.8nm
Coating	4-surface AR Coating, R < 0.5%
Mount	Black anodized mount (standard)
Damage Threshold	> 50 J/cm^2 @ 1064nm, 10ns
Operating Temperature	-20 degC to +60 degC
Temperature Sensitivity	< 0.01lambda/ degC

3. Standard Models

4. Material Properties

Our air spaced wave plates use a precision air-gap construction with synthetic crystalline quartz (alpha-SiO2):

- Air-spaced construction: eliminates cement thermal effects, critical for high-power applications
- Highest damage threshold: > 50 J/cm^2 (5x that of cemented wave plates)
- Zero thermal drift: no cement-related retardation changes
- Full-surface coating: 4-surface coating for maximum transmission
- Black anodized mount: minimizes stray light and thermal absorption

For lower power or space-constrained applications, please select our Zero Order Wave Plates.

5. Coating Specifications

Coating Type	Wavelength	Reflectance	Applications
Single-wavelength A	Design lambda +/- 20nm	R < 0.5%	Laser systems
Broadband AR (Opti	400-700nm or 650-1000nm	R < 1.5%	Tunable lasers, spectroscopy
Dual-wavelength AR	Two design wavelengths	R < 1.0%	Frequency doubling, OPO systems

6. Ordering Information

Sample Policy: First-time customers can order single-piece samples at regular price. 50% sample credit applies to subsequent bulk orders of 50+ pieces.

When ordering or requesting a quote, please provide:
1. Model number or wavelength and retardation type
2. Diameter requirement
3. Coating specification
4. Quantity and delivery requirements
5. Special requirements (mounting, labeling, packaging, etc.)

Minimum Order Quantity (MOQ): 1 piece for standard models. Volume discounts for 10+ pieces.
Lead Time: 1-2 weeks for standard models in stock. 3 weeks for custom wavelengths or sizes. Rush orders available upon request.

7. Contact Information

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