

PhotonEdge

Precision Optical Components

Multiple Order Wave Plate

Product Datasheet | Quartz Crystalline | $\lambda/4$ & $\lambda/2$ Retardation

July 2026 | V1.0

1. Product Overview

PhotonEdge Multiple Order Wave Plates are precision optical components manufactured from high-quality crystalline quartz. These wave plates introduce an integer multiple of wavelength retardation at the design wavelength, suitable for monochromatic laser systems, offering cost-effectiveness and reliable performance.

Our multiple order 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 durable multi-layer anti-reflection (AR) coatings.

Multiple order wave plates offer excellent retardation accuracy at the design wavelength at competitive prices, making them the preferred choice for monochromatic laser systems and research applications.

2. Technical Specifications

Parameter	Specification
Material	Crystalline Quartz (SiO ₂)
Type	1/4 λ (90 deg) or 1/2 λ (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	> 90% of central diameter
Wavefront Distortion	$\lambda/4$ @ 632.8nm
Coating	AR Coating, R < 0.5%
Mount	Unmounted (standard) or Metal Mount (optional)
Damage Threshold	> 10 J/cm ² @ 1064nm, 10ns
Operating Temperature	-20 degC to +60 degC

3. Standard Models

4. Material Properties

Our multiple order wave plates are manufactured from synthetic crystalline quartz (α -SiO₂), a birefringent material with excellent optical properties:

- High birefringence: $\Delta n \sim 0.009$ in the visible range, enabling compact retarder designs
- Wide transmission range: 180nm - 4.5 μ m (UV to mid-IR)
- Low absorption and high laser damage threshold
- Excellent thermal stability and chemical resistance
- High hardness and durable surfaces for demanding optical environments

For broader spectral bandwidth or better temperature stability, please select our Zero Order Wave Plates or Air Spaced Wave Plates.

5. Coating Specifications

Coating Type	Wavelength	Reflectance	Applications
Single-wavelength AR	Design λ +/- 20nm	R < 0.5%	Laser systems, tunable lasers
Broadband AR (Opti)	400-700nm or 650-1000nm	R < 1.5%	Tunable lasers, spectroscopy
Dual-wavelength AR	266nm or 355nm	R < 1.0%	UV lasers

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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Manufacturing: 15+ years experience | 67+ product types | 500+ global clients

Quality Assurance: 100% inspection | $\lambda/10$ surface flatness | Zero-defect shipping