# Quartz Waveplates | WPQ

**Quartz waveplates are zero-order retardation plates (phase plates) which are assembled from pairs of optically contacted crystalline quartz plates and are mounted on aluminum frames.**
**Unlike multiple-order (higher-order) waveplates that are made from a single quartz plate, the net retardations of zero-order waveplates are only slightly affected by temperature change.**

- These products utilize birefringence of quartz and give phase difference of $\lambda/4$ ($\pi/2$, 90°) or $\lambda/2$ ($\pi$, 180°) to the input beams. $\lambda/4$ retarders convert linearly polarization to circularly and circularly polarization to linearly. $\lambda/2$ retarders convert the direction of polarization in 90 degrees.
- Usually linearly polarized beams are input to the waveplates in a leaning of 45 degrees against its optic axis.
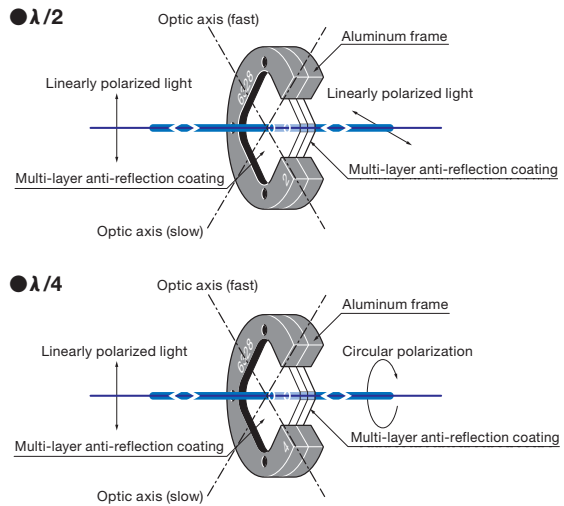
## Specifications

| Material | Optical grade crystalline quarts |
|---|---|
| Material of frame | Aluminum    Finishing: Black anodized |
| Clear aperture | 17×17mm |
| Surface flatness of substrate | $\lambda/10$ |
| Angular deviation of beam | <5″ |
| Coating | Both surfaces: Narrowband multi-layer anti-reflection coating |
| Transmittance | >98.5% |
| Laser Damage Threshold | 1J/cm$^2$ (Laser pulse width 10ns, repetition frequency 20Hz) |
| Surface Quality (Scratch–Dig) | 20–10 |

### Guide

▶ Please contact our Sales Division for customized products. (Customized on size etc.)

### Attention

▶ These products can be used for the beams which wavelengths are in +/−1% of rated wavelength.
▶ The surface flatness is the reflected wavefront distortion of the surface before coating.
▶ Be sure to wear laser safety goggles when checking optical path and adjusting optical axis.

## Schematic

● $\lambda/2$



● $\lambda/4$



## Outline Drawing     (in mm)
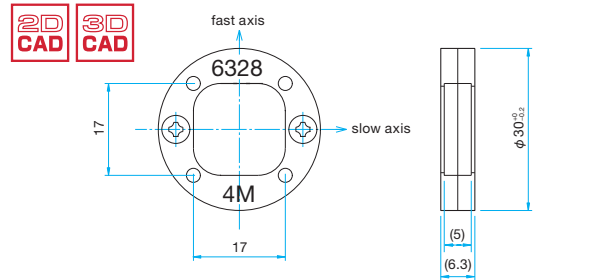
**Compatible Optic Mounts** ▶

PH-30-ARS / SPH-30-ARS

# Quartz Waveplates | WPQ

### λ/2

| Part Number | Wavelength Range [nm] | Theoretical retardation [nm] | Retardation tolerance |
|---|---|---|---|
| WPQ-2660-2M | 266 | 133.0 | $<\lambda/50$ |
| WPQ-3250-2M | 325 | 162.5 | $<\lambda/50$ |
| WPQ-3550-2M | 355 | 177.5 | $<\lambda/50$ |
| WPQ-4050-2M | 405 | 202.5 | $\lambda/100 - \lambda/200$ |
| WPQ-4100-2M | 410 | 205.0 | $\lambda/100 - \lambda/200$ |
| WPQ-4416-2M | 441.6 | 220.8 | $\lambda/100 - \lambda/200$ |
| WPQ-4579-2M | 457.9 | 229.0 | $\lambda/100 - \lambda/200$ |
| WPQ-4880-2M | 488 | 244.0 | $\lambda/100 - \lambda/200$ |
| WPQ-5145-2M | 514.5 | 257.3 | $\lambda/100 - \lambda/200$ |
| WPQ-5320-2M | 532 | 266.0 | $\lambda/100 - \lambda/200$ |
| WPQ-6328-2M | 632.8 | 316.4 | $\lambda/100 - \lambda/200$ |
| WPQ-6700-2M | 670 | 335.0 | $\lambda/100 - \lambda/200$ |
| WPQ-7800-2M | 780 | 390.0 | $\lambda/200 - \lambda/500$ |
| WPQ-8300-2M | 830 | 415.0 | $\lambda/200 - \lambda/500$ |
| WPQ-10640-2M | 1064 | 532.0 | $\lambda/200 - \lambda/500$ |
| WPQ-13000-2M | 1300 | 650.0 | $\lambda/200 - \lambda/500$ |
| WPQ-15500-2M | 1550 | 775.0 | $\lambda/200 - \lambda/500$ |

### λ/4

| Part Number | Wavelength Range [nm] | Theoretical retardation [nm] | Retardation tolerance |
|---|---|---|---|
| WPQ-2660-4M | 266 | 66.5 | $<\lambda/50$ |
| WPQ-3250-4M | 325 | 81.3 | $<\lambda/50$ |
| WPQ-3550-4M | 355 | 88.8 | $<\lambda/50$ |
| WPQ-4050-4M | 405 | 101.3 | $\lambda/100 - \lambda/200$ |
| WPQ-4100-4M | 410 | 102.5 | $\lambda/100 - \lambda/200$ |
| WPQ-4416-4M | 441.6 | 110.4 | $\lambda/100 - \lambda/200$ |
| WPQ-4579-4M | 457.9 | 114.5 | $\lambda/100 - \lambda/200$ |
| WPQ-4880-4M | 488 | 122.0 | $\lambda/100 - \lambda/200$ |
| WPQ-5145-4M | 514.5 | 128.6 | $\lambda/100 - \lambda/200$ |
| WPQ-5320-4M | 532 | 133.0 | $\lambda/100 - \lambda/200$ |
| WPQ-6328-4M | 632.8 | 158.2 | $\lambda/100 - \lambda/200$ |
| WPQ-6700-4M | 670 | 167.5 | $\lambda/100 - \lambda/200$ |
| WPQ-7800-4M | 780 | 195.0 | $\lambda/200 - \lambda/500$ |
| WPQ-8300-4M | 830 | 207.5 | $\lambda/200 - \lambda/500$ |
| WPQ-10640-4M | 1064 | 266.0 | $\lambda/200 - \lambda/500$ |
| WPQ-13000-4M | 1300 | 325.0 | $\lambda/200 - \lambda/500$ |
| WPQ-15500-4M | 1550 | 387.5 | $\lambda/200 - \lambda/500$ |