



Waveplates

Multiple-Order Waveplates: Multiple-Order Waveplates are the least expensive option in quartz waveplates for polarization control. Multiple-Order Waveplates are wavelength and polarization specific. This product is more susceptible to polarization shift due to thermal expansion. Standard multiple order inventory at OptiSource is modeled on thicknesses of 0.400-0.600mm for pieces 10.00-30.00mmØ.

Zero-Order Waveplates: Zero-Order Waveplates are comprised of 2 pieces of crystal quartz with the optical axes assembled at 90° to one another. OptiSource utilizes 3 assembly processes for Zero-Order Waveplates. Standard OptiSource compound Zero-Order Waveplates are optically contacted. Please specify if you wish have your compound Zero-Order Waveplates assembled via another method such as air-spaced or glued. Zero-Order Waveplates are more resistant to polarization shift due to thermal variations in the work environment.

Low-Order Waveplates: Low-Order Waveplates range in thickness from 0.100-0.250mm. This product line provides improved stability against polarization shift due to thermal expansion in a single (multiple order) element format. Because of the reduced thickness, Low-Order Waveplates can also be used in femto-second applications without significant pulse elongation, while still being thick enough for easy handling.

Ultra-Thin Waveplates: Ultra-Thin Waveplates range in thickness from 0.040mm(40µ) - 0.099mm(99µ). Ultra-thin Waveplates are “stand-alone” in configuration, and depending on wavelength and desired retardation can many times serve as single piece zero-order waveplate. Waveplates in this “stand-alone” configuration should be more effective in femto-second applications as the minimal thickness will lessen the elongation of the pulse. It must be noted that Ultra-thin Waveplates are extremely difficult to handle.

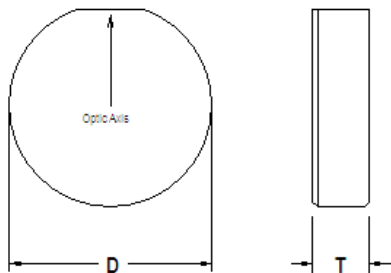
Dual-Order Waveplates: Dual-Order Waveplates are designed to function coincidentally at more than one specific wavelength and polarization. OptiSource, LLC designs Dual-Order Waveplates to meet standard retardation specifications. In the event that the design is unable to achieve standard specifications, OptiSource will ask the customer to define the wavelength and retardation for which the design should be optimized. Please be aware that many times the only coincident thickness occurs at significantly higher orders than standard OptiSource designs for standard Multiple-Order Waveplates.

Compound Dual-Order Waveplates: As previously mentioned, Dual-Order Waveplate design might entail thicknesses of such high order that retardation degradation becomes an issue due to thermal shift. OptiSource offers our “Compound Dual-Order Waveplate” to provide a thermally stable component when the application dictates the need .

Achromatic Waveplates: Achromatic Waveplates are comprised of 2 different birefringent materials, magnesium fluoride and crystal quartz. The combination of these two materials assembled in either an air-spaced or cemented configuration, allows for higher quality polarization values over a broader spectral region than a quartz Zero-Order Waveplate. OptiSource provides achromatic waveplates for 4 different bandwidths over the visible to the near IR regions. These are 450-650nm, 550-750nm, 650-1100nm, and 900-2100nm.

Multiple-Order Waveplates

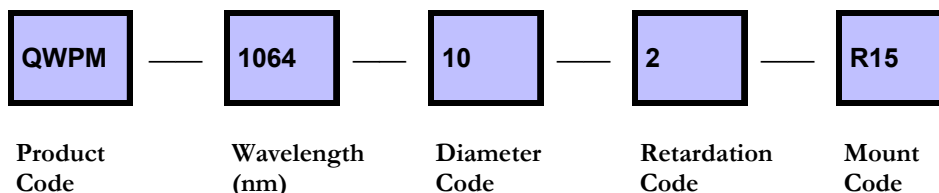
Product Code: QWPM



Substrate Material: Crystal Quartz
 Diameter Tolerance: +0.000/-0.010" [+0.00/-0.25mm]
 Standard Thickness Range: 0.250-1.50mm
 Transmitted Wavefront Distortion: $\lambda/10$ @ 632.8nm over clear aperture
 Surface Quality: 10-5
 Parallelism: ≤ 0.5 arc seconds
 Clear Aperture: \geq central 85% of diameter
 Retardation Tolerance: $\lambda/100$ - $\lambda/600$ typical (wavelength dependent)
 Damage Threshold: 1MW/cm² (CW); 10J/cm², 10ns pulse typical @ 1064nm

- Multiple-Order Waveplates are available coated or uncoated, with or without anodized aluminum mounts
- Customer specified antireflection coatings are available, beginning on catalog page 42
- Any standard diameter in any wavelength from 248-1064nm can be ordered at matrix pricing (other wavelengths and sizes available upon request)

Order Example



Standard Wavelengths (nm)

248.0	257.0	266.0	308.0	354.7
400.0	488.0	514.5	532.0	632.8
670.0	694.3	755.0	780.0	800.0
830.0	870.0	980.0	1047.0	1053.0
1064.0				

Standard Diameter Codes

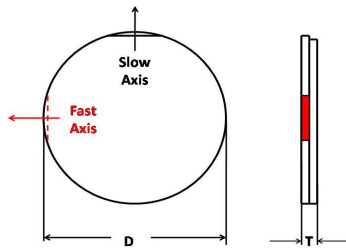
04: 10.0mm
05: 12.7mm
06: 15.0mm
08: 20.0mm
10: 25.4mm
12: 30.0mm
15: 38.1mm
20: 50.8mm

Standard Mount Codes

R10: 25.4mm OD
R15: 38.1mm OD
R20: 50.8mm OD
R30: 76.2mm OD

Zero-Order Waveplates

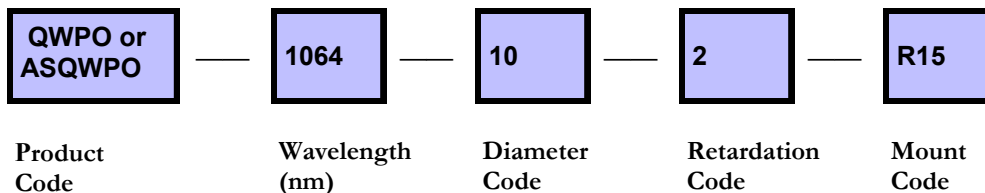
Product Code: QWPO/ASQWPO



Substrate Material: Crystal Quartz
 Diameter Tolerance: +0.000/-0.010" [+0.00/-0.25mm]
 Standard Thickness Range: 0.80-1.60mm
 Transmitted Wavefront Distortion: $\lambda/10$ @ 632.8nm over clear aperture
 Surface Quality: 10-5
 Parallelism: ≤ 0.5 arc seconds
 Clear Aperture: \geq central 85% of diameter
 Retardation Tolerance: $\lambda/100$ - $\lambda/600$ typical (wavelength dependent)
 Damage Threshold: 1MW/cm² (CW); 10J/cm², 10ns pulse typical @ 1064nm

- Zero-Order Waveplates are available coated or uncoated; with or without anodized aluminum mounts
- Customer specified antireflection coatings are available, beginning on catalog page 42
- Standard Zero-Order waveplates are optically contacted, but are also available **air-spaced (AS)**
- Any standard diameter in any wavelength from 248-1064nm can be ordered at matrix pricing (other wavelengths and sizes available upon request)

Order Example



Standard Wavelengths (nm)

248.0	257.0	266.0	308.0	354.7
400.0	488.0	514.5	532.0	632.8
670.0	694.3	755.0	780.0	800.0
830.0	870.0	980.0	1047.0	1053.0
1064.0				

Standard Diameter Codes

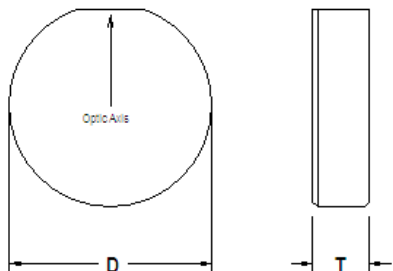
04: 10.0mm
05: 12.7mm
06: 15.0mm
08: 20.0mm
10: 25.4mm
12: 30.0mm
15: 38.1mm
20: 50.8mm

Standard Mount Codes

R10: 25.4mm OD
R15: 38.1mm OD
R20: 50.8mm OD
R30: 76.2mm OD

Low-Order Waveplates

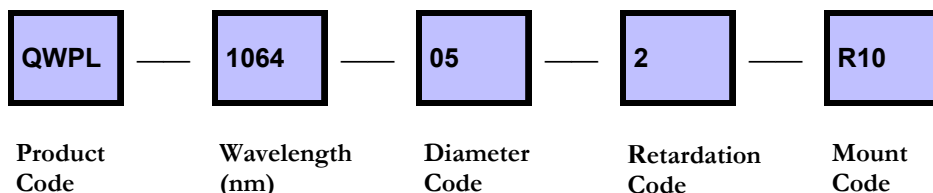
Product Code: QWPL



Substrate Material: Crystal Quartz
 Diameter Tolerance: +0.000/-0.010" [+0.00/-0.25mm]
 Standard Thickness Range: 0.100-0.250mm
 Transmitted Wavefront Distortion: $\lambda/10$ @ 632.8nm over clear aperture
 Surface Quality: 10-5
 Parallelism: ≤ 0.5 arc seconds
 Clear Aperture: \geq central 85% of diameter
 Retardation Tolerance: $\lambda/100$ - $\lambda/600$ typical (wavelength dependent)
 Damage Threshold: 1MW/cm² (CW); 10J/cm², 10ns pulse typical @ 1064nm

- Low-Order Waveplates are available coated or uncoated; with or without anodized aluminum mounts
- Customer specified antireflection coatings are available, beginning on catalog page 42
- Any standard diameter in any wavelength from 248-1064nm can be ordered at matrix pricing (other wavelengths and sizes are available upon request)

Order Example



Standard Wavelengths (nm)

248.0	257.0	266.0	308.0	354.7
400.0	488.0	514.5	532.0	632.8
670.0	694.3	755.0	780.0	800.0
830.0	870.0	980.0	1047.0	1053.0
1064.0				

Standard Diameter Codes

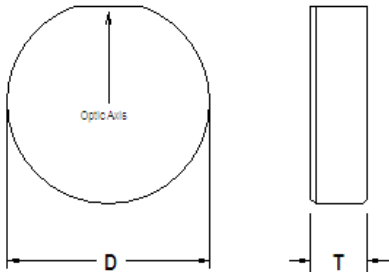
04: 10.0mm
05: 12.7mm
06: 15.0mm
08: 20.0mm
10: 25.4mm
12: 30.0mm
15: 38.1mm
20: 50.8mm

Standard Mount Codes

R10: 25.4mm OD
R15: 38.1mm OD
R20: 50.8mm OD
R30: 76.2mm OD

Ultra-Thin Waveplates

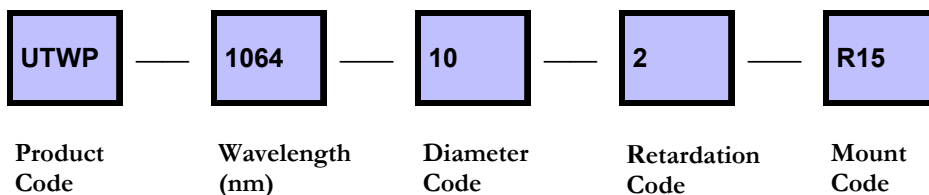
Product Code: UTWP



Substrate Material: Crystal Quartz
 Diameter Tolerance: +0.000/-0.010" [+0.00/-0.25mm]
 Standard Thickness Range: 50-100 microns
 Transmitted Wavefront Distortion: $\lambda/10$ @ 632.8nm over clear aperture
 Surface Quality: 10-5
 Parallelism: ≤ 0.5 arc seconds
 Clear Aperture: \geq central 85% of diameter
 Retardation Tolerance: $\lambda/100$ - $\lambda/600$ typical (wavelength dependent)
 Damage Threshold: 1MW/cm² (CW); 10J/cm², 10ns pulse typical @ 1064nm

- Ultra-Thin Waveplates are available coated or uncoated; with or without anodized aluminum mounts
- Customer specified antireflection coatings are available, beginning on catalog page 42
- Any standard diameter in any wavelength from 248-1064nm can be ordered at matrix pricing (other wavelengths and sizes are available upon request)

Order Example



Standard Wavelengths (nm)

248.0	257.0	266.0	308.0	354.7
400.0	488.0	514.5	532.0	632.8
670.0	694.3	755.0	780.0	800.0
830.0	870.0	980.0	1047.0	1053.0
1064.0				

Standard Diameter Codes

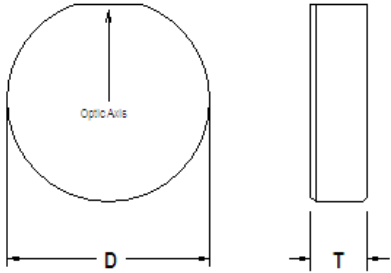
04: 10.0mm
05: 12.7mm
06: 15.0mm
08: 20.0mm
10: 25.4mm
12: 30.0mm
15: 38.1mm
20: 50.8mm

Standard Mount Codes

R10: 25.4mm OD
R15: 38.1mm OD
R20: 50.8mm OD
R30: 76.2mm OD

Dual-Order Waveplates

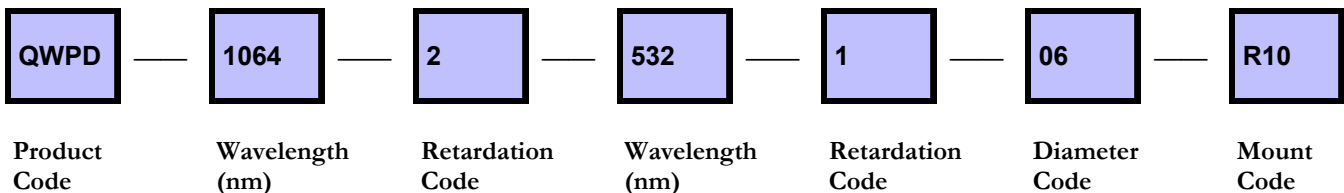
Product Code: QWPD



Substrate Material: Crystal Quartz
 Diameter Tolerance: +0.000/-0.010" [+0.00/-0.25mm]
 Standard Thickness Range: 0.100-3.00mm
 Transmitted Wavefront Distortion: $\lambda/10$ @ 632.8nm over clear aperture
 Surface Quality: 10-5
 Parallelism: ≤ 0.5 arc seconds
 Clear Aperture: \geq central 85% of diameter
 Retardation Tolerance: $\lambda/100$ - $\lambda/500$ typical (wavelength dependent)
 Damage Threshold: 1MW/cm² (CW); 10J/cm², 10ns pulse typical @ 1064nm

- Dual-Order Waveplates are available coated or uncoated; with or without anodized aluminum mounts
- Customer specified antireflection coatings are available, beginning on catalog page 42
- In the event that two requested wavelengths and retardations do not allow for the design to meet standard Opti-Source retardation tolerances, the customer will be requested to optimize for one wavelength and retardation
- Any standard diameter in any wavelength from 248-1064nm can be ordered at matrix pricing (other wavelengths and sizes available upon request)

Order Example



Standard Wavelengths (nm)

248.0	257.0	266.0	308.0	354.7
400.0	488.0	514.5	532.0	632.8
670.0	694.3	755.0	780.0	800.0
830.0	870.0	980.0	1047.0	1053.0
1064.0				

Standard Diameter Codes

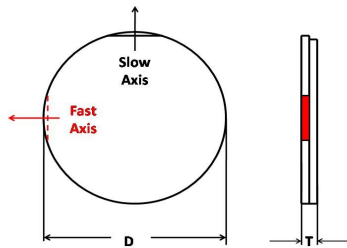
04: 10.0mm
05: 12.7mm
06: 15.0mm
08: 20.0mm
10: 25.4mm
12: 30.0mm
15: 38.1mm
20: 50.8mm

Standard Mount Codes

R10: 25.4mm OD
R15: 38.1mm OD
R20: 50.8mm OD
R30: 76.2mm OD

Compound Dual-Order Waveplates

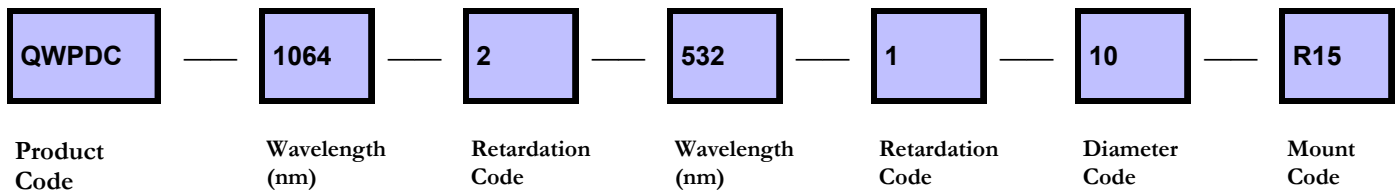
Product Code: QWPDC



Substrate Material: Crystal Quartz
 Diameter Tolerance: +0.000/-0.010" [+0.00/-0.25mm]
 Standard Thickness Range: 0.100-3.00mm
 Transmitted Wavefront Distortion: $\lambda/10$ @ 632.8nm over clear aperture
 Surface Quality: 10-5
 Parallelism: ≤ 0.5 arc seconds
 Clear Aperture: \geq central 85% of diameter
 Retardation Tolerance: $\lambda/100$ - $\lambda/500$ typical (wavelength dependent)
 Damage Threshold: 1MW/cm² (CW); 10J/cm², 10ns pulse typical @ 1064nm

- Compound Dual-Order Waveplates are available coated or uncoated; with or without anodized aluminum mounts
- Customer specified antireflection coatings are available, beginning on catalog page 42
- In the event that two requested wavelengths and retardations do not allow for the design to meet standard Opti-Source retardation tolerances, the customer will be requested to optimize for one wavelength and retardation
- The two plate design offers more thermal stability than the single plate design

Order Example



Standard Wavelengths (nm)

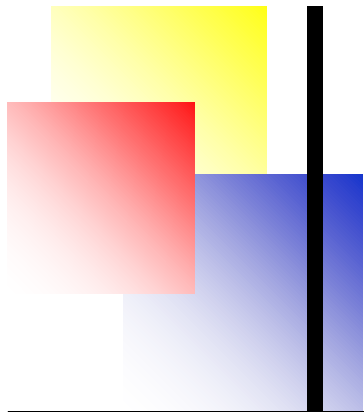
248.0	257.0	266.0	308.0	354.7
400.0	488.0	514.5	532.0	632.8
670.0	694.3	755.0	780.0	800.0
830.0	870.0	980.0	1047.0	1053.0
1064.0				

Standard Diameter Codes

04: 10.0mm
05: 12.7mm
06: 15.0mm
08: 20.0mm
10: 25.4mm
12: 30.0mm
15: 38.1mm
20: 50.8mm

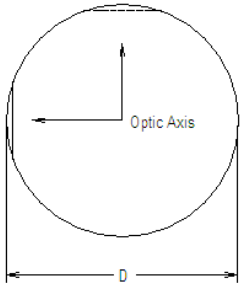
Standard Mount Codes

R10: 25.4mm OD
R15: 38.1mm OD
R20: 50.8mm OD
R30: 76.2mm OD



Achromatic Waveplates

Product Code: ACWP

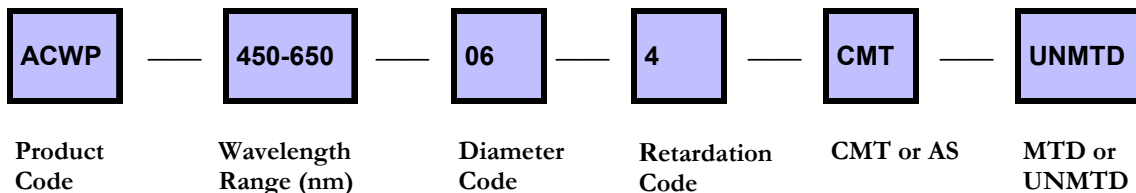


Substrate Material: Synthetic Crystal Quartz/Magnesium Fluoride
 Transmitted Wavefront Distortion: $\lambda/4$ @ 632.8nm over clear aperture
 Surface Quality: 40-20
 Retardation Tolerance: $\lambda/100$ typical

WAVELENGTH REGIONS: 450-650nm; 550-750nm, 650-1100nm, 900-2100nm

- Achromatic Waveplates are available coated or uncoated
- Cemented Achromats are available mounted or unmounted; Air Spaced Achromats are available mounted only
- **Quarter-Wave Air Spaced Achromats are not available for wavelength regions 450-650nm or 550-750nm**

Order Example



Standard Diameter Codes

04: 10.0mm
06: 15.0mm
10: 25.4mm

Standard Mount Sizes and CA

Optic Diameter (mm)	Mount diameter and length (mm)	CA (mm)
10.0	25.4 x 6.0	9.5
15.0	25.4 x 6.0	13.5
25.4	30.0 x 6.0	22.9