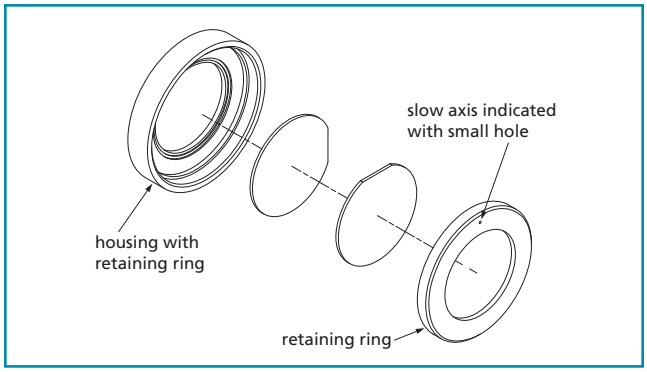
Zero-Order Quartz Waveplates

Zero-order waveplates are the preferred solution for applications with a temperature range of greater than 6° or a wavelength range greater than 2 nm. Compound zero-order waveplates provide retardations that are a single submultiple of 2π in phase, therefore providing for wide tunability about the design wavelength. They also offer excellent temperature stability as temperature effects of the two components parts tend to cancel out.

CVI Laser Optics offers QWPO zero-order waveplates in three different options: optically contacted, contacted in a ring mount, or air spaced in a ring mount.

High UV energies can separate optically contacted waveplates. Therefore, CVI Laser Optics recommends QWPO-AS air-spaced zero-order waveplates for wavelengths shorter than 248 nm and repetition rates higher than 1 KHz. Please call to discuss specifications for waveplates designed for wavelengths shorter than 248 nm.

- Single submultiple of 2π phase retardation
- Excellent temperature stability
- Wide tunability about design wavelength
- High performance specifications, λ/10 TWD
- Damage threshold > 10J/cm^2, 20-ns pulse at 1064 nm
- Ask our Applications Engineers about OEM opportunities for other wavelengths, retardations or sizes.



QWPO-series zero-order quartz waveplate air-spaced assembly

SPECIFICATIONS: Zero-Order Quartz Waveplates

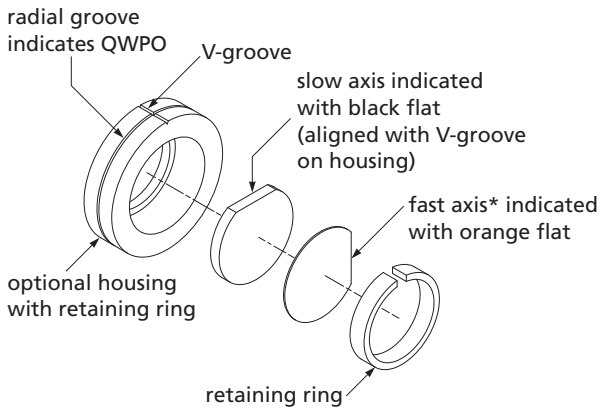
Antireflection Coating	$R \leq 0.25\%$ per surface
Transmitted Wavefront	λ/10 p-v at 633 nm
Damage Threshold	10 J/cm^2, 20 nsec, 20 Hz; 1 MW/cm^2 cw @ 1064 nm
Optical Material	Crystal Quartz
Surface Quality	10-5 scratch and dig
Diameter	$\phi + 0/-0.25$ mm (unmounted) $\phi \pm 0.127$ mm (mounted)
Parallelism	≤ 0.5 arc sec
Retardation Tolerance	λ/200 to λ/500 at 23°C
Bandwidth	16 nm at 800 nm for λ/200 - λ/500 80 nm at 800 nm for λ/50

From our Shelves to Your Lab –
Standard Products for *Fast* Delivery

Standard QWPO Waveplates

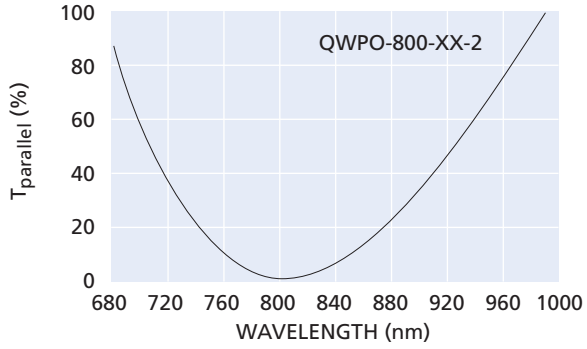
Wavelength (nm)	ϕ (mm)	Retardation	PART NUMBER
355	12.7	λ/2	QWPO-355-05-2
355	25.4	λ/2	QWPO-355-10-2
532	12.7	λ/2	QWPO-532-05-2
532	25.4	λ/2	QWPO-532-10-2
532	25.4	λ/4	QWPO-532-10-4
780	25.4	λ/2	QWPO-780-10-2
780	25.4	λ/4	QWPO-780-10-4
800	12.5	λ/2	QWPO-800-05-2
800	12.5	λ/4	QWPO-800-05-4
800	25.4	λ/2	QWPO-800-10-2
800	25.4	λ/4	QWPO-800-10-4
1030	12.7	λ/2	QWPO-1030-05-2
1030	25.4	λ/2	QWPO-1030-10-2
1030	25.4	λ/4	QWPO-1030-10-4
1053	25.4	λ/2	QWPO-1053-10-2
1064	12.5	λ/2	QWPO-1064-05-2
1064	12.5	λ/4	QWPO-1064-05-4
1064	25.4	λ/2	QWPO-1064-10-2
1064	25.4	λ/4	QWPO-1064-10-4
1550	25.4	λ/2	QWPO-1550-10-2
1550	25.4	λ/4	QWPO-1550-10-4

(continued)



* fast axis of the compound QWPO waveplate.
The orange flat marks the slow axis of the thinner element.

QWPO-series zero-order quartz waveplate with ring mount



Zero-order crystal quartz half-wave waveplate for 800 nm: the transmission between parallel polarizers is shown using a 0-10% scale. Its extinction ratio is better than 100:1 over a bandwidth of about 95nm centered at 800nm.

Optional QWPO Zero-Order Waveplates

Can't find exactly what you are looking for in our Standard Products? Use the unique selection menu below to build your own part!

Build Your Own — **QWPO — 532 — 10 — 4 — R15**

Product Code
QWPO

Wavelength (nm)
Select from table

Waveplate Diameter Code
Select from table

Retardation Code	Retardation in Waves
2	0.500
4	0.250

Ring-Mount Code (optional)*
Select from table

** An "AS" option code specifies an air-spaced waveplate with ring mount. An "R" option code specifies a contacted waveplate with ring mount. Leaving the option code blank specifies a contacted waveplate without a ring mount.*

QWPO Wavelengths & Sizes Offering

	Waveplate Diameter Code					
Wavelength	05	08	10	12	15	20
193**			X			
248		X				
266	X		X			
325		X				
355	X	X	X	X		
400	X		X			
488			X			
515		X				
532	X	X	X	X	X	
633	X	X	X			
670			X			
780	X		X			X
800	X	X	X		X	X
830		X				
850	X		X			
940			X			
1030	X	X	X			X
1047***	X					
1053	X		X		X	X
1064	X	X	X		X	X
1550	X		X			X

*** 193 nm products are provided in air-spaced configuration as standard, in order to maximize laser damage threshold performance. Call an applications engineer to special order contacted configurations for this wavelength.*
**** 1047 nm products are provided with λ/2 retardation only*

Waveplate Diameters and Protective Ring Mounts

Waveplate Diameter Code	Waveplate Diameter [mm (in.)]	**Contacted Waveplates Optional Ring-Mount Code**	**Air-spaced Waveplates Ring-Mount Code**	Ring-Mount CA (in.)	Ring-Mount OD (±0.005 in.)	Ring-Mount Thickness (in.)
05	(0.500)	**R10**	**AS10**	0.425	1.000	0.250
08	20.0	**R10**	**AS10**	0.590	1.000	0.250
10	(1.000)	**R15**	**AS15**	0.850	1.500	0.250
12	30.0	**R15**	**AS15**	1.000	1.500	0.250
15	(1.500)	**R20**	**AS20**	1.275	2.000	0.250
20	(2.000)	**R30**	**AS30**	1.700	3.000	0.250