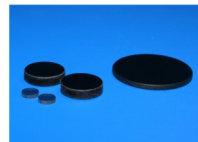




Neutral Density Filter-Absorptive

Specifications

Material	Absorptive Glass
Dimension Tolerance	+0/-0.2mm
Thickness Tolerance	±0.2mm
Surface Quality	80/50 scratch and dig
Clear Aperture	>90%
Flatness	<2λ@632.8nm
Parallelism	<5 arc minutes
Chamfer	Protective<0.5mmx45°
OD Tolerance	OD±10%@Design Wavelength



Optical Density: OD
Transmission: T
OD=Log(1/T)

Standard Product-Neutral Density Filter-Absorptive

Part No.		Optical Density (400–700nm)
Φ25.4mm	50.0x50.0mm	
NDT9125-0.1	NDT9150-S-0.1	0.1
NDT9125-0.2	NDT9150-S-0.2	0.2
NDT9125-0.3	NDT9150-S-0.3	0.3
NDT9125-0.4	NDT9150-S-0.4	0.4
NDT9125-0.5	NDT9150-S-0.5	0.5
NDT9125-0.8	NDT9150-S-0.8	0.8
NDT9125-1	NDT9150-S-1	1.0
NDT9125-2	NDT9150-S-2	2.0
NDT9125-3	NDT9150-S-3	3.0

Neutral Density Filter-Reflective

Specifications

Material	B270
Dimension Tolerance	+0/-0.2mm
Thickness	2.0±0.2mm
Surface Quality	80/50 scratch and dig
Clear Aperture	>90%
Flatness	<2λ@632.8nm
Parallelism	<5 arc minutes
Chamfer	Protective<0.5mmx45°
Coating	Metallic reflective coating
OD Tolerance	OD±10%@Design Wavelength

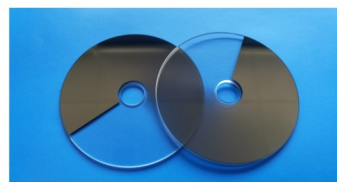
Standard Product-Neutral Density Filter-Reflective

Part No.	Diameter(mm)	Optical Density(400–700nm)
NDR9125-0.1	25.4	0.1
NDR9125-0.2	25.4	0.2
NDR9125-0.3	25.4	0.3
NDR9125-0.4	25.4	0.4
NDR9125-0.5	25.4	0.5
NDR9125-0.8	25.4	0.8
NDR9125-1	25.4	1.0
NDR9125-2	25.4	2.0
NDR9125-3	25.4	3.0

Variable Neutral Density Filter

Specifications

Material	BK7
Dimension Tolerance	+0/-0.2mm
Thickness Tolerance	±0.2mm
Surface Quality	60/40 scratch and dig
Clear Aperture	>90%
Flatness	<2λ@632.8nm
Parallelism	<3arc minutes
Coating	Metallic reflective coating
Coating Area	0-270°
OD Tolerance	±5% of OD Extremes



Standard Product-Variable Neutral Density Filter

Part No.	Material	OD(mm)	ID(mm)	Thickness(mm)	Optical Density(400–700nm)
VND9150-1	BK7	50.0	8.0	1.5	0-1.0
VND9150-2	BK7	50.0	8.0	1.5	0-2.0
VND9150-3	BK7	50.0	8.0	1.5	0-3.0
VND9100-1	BK7	100.0	8.3	2.0	0-1.0
VND9100-2	BK7	100.0	8.3	2.0	0-2.0
VND9100-3	BK7	100.0	8.3	2.0	0-3.0

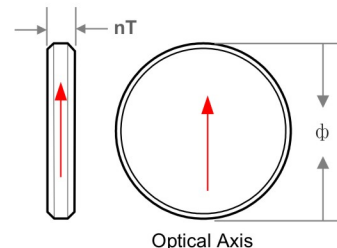
Birefringent Filter

Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Thickness Tolerance	±0.005mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<5 arc seconds
Thickness	T=0.5mm, 1.0mm, 1.5mm, 2.0mm
Coating	None

Standard Product-Birefringent Filter

Part No.	Diameter(mm)	Thickness(mm)
BIF3012-0.5	12.7	0.5
BIF3012-1	12.7	1.0
BIF3012-2	12.7	2.0
BIF3012-4	12.7	4.0
BIF3025-0.5	25.4	0.5
BIF3025-1	25.4	1.0
BIF3025-2	25.4	2.0
BIF3025-4	25.4	4.0



Waveplate

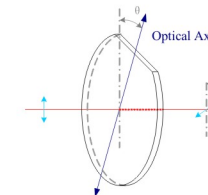
Waveplate Overview

Waveplates (retarders) are made from birefringent materials which introduce a phase difference between the fast and slow principal axis of the waveplate, it can be used to control polarization state of polarized beam. When ordering the waveplate, we need to know the wavelength, retardation, size and type of waveplate(Zero order or Multi Order). The waveplates can install into metal mount according to customer requirements. Union Optic provides most common using wavelengths waveplates for customers, special wavelengths and special retardation waveplates such as lambda/8, lambda/20 and etc can also be provided upon request.



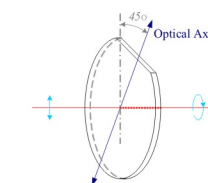
Half Waveplate

When applying a linearly polarized beam to a half waveplate, it emerges as a linearly polarized beam but its polarization plane is rotated with respect to the polarization plane of the input beam. The rotation of the polarization plane is such that the angle between the input polarization and the output polarization is twice the angle between the input polarization and the waveplate's axis. When applying a circularly polarized beam, a clockwise circular polarization will transform into a counter-clockwise circular polarization and vice versa. Half waveplates are often used as continuously adjustable polarization rotators and as a variable ratio beamsplitter when used in conjunction with a polarization beamsplitter cube.



Quarter Waveplate

When applying a linearly polarized beam with the polarization plane aligned at 45deg to the waveplate's principal plane, the output beam will be circularly polarized. Similarly when applying a circularly polarized beam to a λ/4 waveplate the output beam will be linearly polarized. When a quarter waveplate is double passed, i.e. by mirror reflection, it acts as a half waveplate and rotates the plane of polarization to a certain angle. Quarter waveplates are widely used in creating circular polarization from linear or linear polarization from circular, ellipsometry, optical pumping, suppressing unwanted reflection, optical isolation and etc.



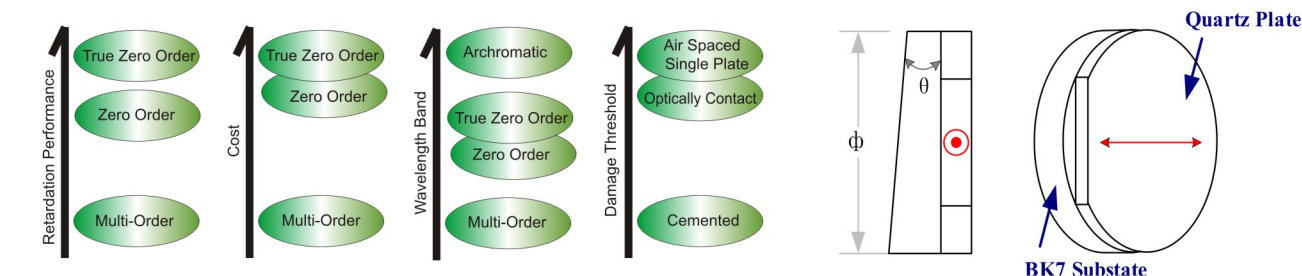
Waveplate Comparison

Waveplate Type		Structure	With Glue	Temperature Bandwidth	Wavelength Bandwidth	Retardation Tolerance	Parallelism	Damage Threshold	Other Features
Zero order Waveplate	Cemented	Two Plate	Yes	Large	Wide	High	Good	Low	
	Optically Contacted	Two Plate	No	Large	Wide	Higher	Better	High	
	Air Spaced	Two Plate	No	Large	Wide	Higher	Better	Higher	
True Zero order Waveplate	Cemented	Two Plate	Yes	Large	Wide	Higher	Better	Low	
	Single Plate	Single Plate	No	Larger	Wide	Higher	Better	Higher	Wide Acceptance Angle
Single Plate High Power Waveplate		Single Plate	No	Larger	Wide	Higher	Better	Higher	Wide Acceptance Angle
Multi Order		Single Plate	No	Low	Narrow	General	Better	Higher	
Dual Wavelength		Single Plate	No	Low	Narrow	General	Better	Higher	
Middle Infrared Zero Order Waveplate		Single/Two Plate	No	Large	Wide	General	Better	High	Using in 2.5-6.0μm Range
Achromatic Waveplate	Cemented	Two/Multi Plate	Yes	Large	Very broad	High	Good	Low	
	Air Spaced	Two/Multi Plate	No	Large	Very broad	High	Better	Higher	
Wedge Waveplate		Two Plate	Yes	Large	Wide	Higher	/	Low	Eliminate Etalon effect

Firstly, you should know the retardation, is it a half waveplate or a quarter waveplate? Or even a special retardation?

Then, you should know the size and working wavelength.

Last, you should choose a type of waveplate. If temperature bandwidth and wavelength bandwidth is important for you, you should choose zero order or true zero order. For zero order, optical contacted has better wavefront distortion and parallelism, air spaced has high damage threshold. True zero order is better than zero order waveplate at all parameters and can be used at more critical application. When temperature bandwidth and wavelength bandwidth is not a problem for you, multi order is a better choice, it is cheap. If a zero order or true zero order waveplate does not offer retardance over a wide enough wavelength band, one solution is to use an achromatic waveplate, it has over hundreds of nanometers bandwidth.



Frequently Used Wavelength(nm)

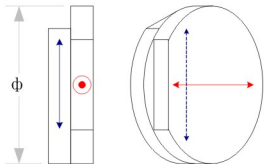
213	248	257	266	308	355	405	488	515	532	546	632.8
780	800	852	894	980	1030	1047	1053	1064	1310	1550	2020



Achromatic Waveplate

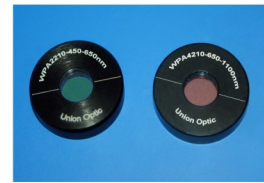
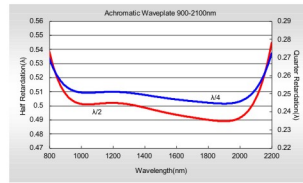
Achromatic waveplate is similar to zero order waveplate except that the two plates are made from different birefringent crystals. Since the dispersion of the birefringence of two materials is different, it is possible to specify the retardation values at a broad wavelength range. So, the retardation will be less sensitive to wavelength change. In other words, it can be used at a broadband wavelength range.

- Epoxy Cemented or Air Spaced available
- Very Broad Bandwidth
- Custom size available
- RoHS Compliant

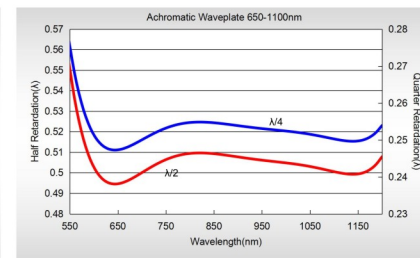
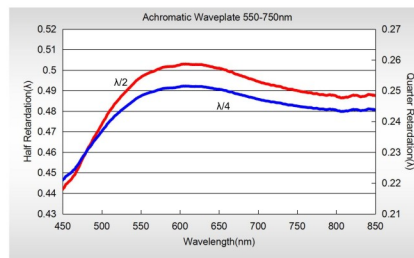
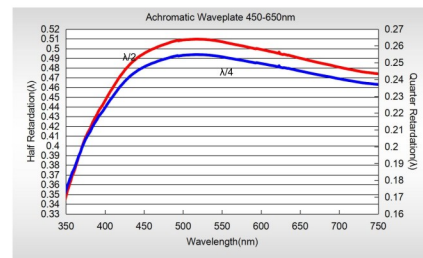


Specifications

Material	Crystal Quartz+MgF ₂
Dimension Tolerance	+0/-0.2mm
Surface Quality	40/20 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/4@632.8nm (for air spaced type)
Parallelism	<10 arc seconds (for single plate)
Retardation Tolerance	<λ/100
Standard Wavelength	450-650nm 550-750nm 650-1100nm 900-2100nm
Coating	Both sides AR coated, R<1% per face
Damage Threshold	Cemented: >500mJ/cm ² , 20ns, 20Hz @1064nm Air spaced: >5J/cm ² , 20ns, 20Hz @1064nm



Retardation Curve



Standard Product-Achromatic Waveplate-Cemented

λ/2 Part No.	λ/4 Part No.	Diameter(mm)	Type	Wavelength(nm)
WPA2210-450-650	WPA4210-450-650	10.0	Cemented	450-650
WPA2215-450-650	WPA4215-450-650	15.0	Cemented	450-650
WPA2210-550-750	WPA4210-550-750	10.0	Cemented	550-750
WPA2215-550-750	WPA4215-550-750	15.0	Cemented	550-750
WPA2210-650-1100	WPA4210-650-1100	10.0	Cemented	650-1100
WPA2215-650-1100	WPA4215-650-1100	15.0	Cemented	650-1100
WPA2210-900-2100	WPA4210-900-2100	10.0	Cemented	900-2100
WPA2215-900-2100	WPA4215-900-2100	15.0	Cemented	900-2100

Standard Product-Achromatic Waveplate-Air Spaced

λ/2 Part No.	λ/4 Part No.	Mount Diameter(mm)	Mount Thickness(mm)	CA (mm)	Type	Wavelength(nm)
WPA2420-450-650	WPA4420-450-650	25.4	6.0	18.0	Air Spaced	450-650
WPA2420-550-750	WPA4420-550-750	25.4	6.0	18.0	Air Spaced	550-750
WPA2420-650-1100	WPA4420-650-1100	25.4	6.0	18.0	Air Spaced	650-1100
WPA2420-900-2100	WPA4420-900-2100	25.4	6.0	18.0	Air Spaced	900-2100

Order Information

WPA2210-650-1100 — M25.4 — Part No.-Mount Diameter



Super Achromatic Waveplate

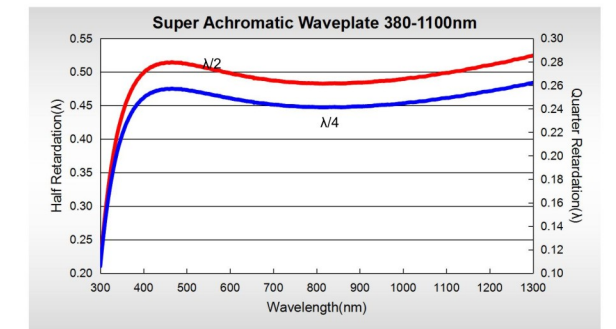
Super Achromatic Waveplate is similar to achromatic waveplate but providing a flat retardance over a super broadband wavelength range. Normal achromatic waveplate consists of one quartz plate and one MgF₂ plate, which has only few hundreds of nanometer wavelength range. Union Optic's super achromatic waveplate is made from three material, quartz, MgF₂ and sapphire, which can provide flat retardance on a broader wavelength range.

- Flat Retardance Over a Super Broadband Range
- Optically Contacted, Epoxy Free
- Custom Size & Wavelength Available
- RoHS Compliant



Specifications

Material	Crystal Quartz+MgF ₂ +Sapphire
Dimension Tolerance	+0/-0.2mm
Surface Quality	60/40 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/4@632.8nm
Parallelism	<10 arc seconds (for single plate)
Retardation Tolerance	<λ/100
Standard Wave	λ/2, λ/4
Standard Wavelength	380-1100nm, 600-2000nm
Coating	Upon request
Damage Threshold	>2J/cm ² , 20ns, 20Hz @1064nm



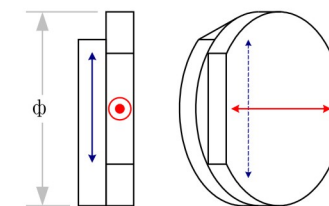
Standard Product-Super Achromatic Waveplate

Part No.	Retardation	Mount(mm)	Waveplate Diameter(mm)	CA(mm)	Type	Wavelength(nm)
WSA4320-380-1100-M25.4	λ/4	φ 25.4x6.0	20.0	18.0	Optically Contacted	380-1100
WSA4320-600-2000-M25.4	λ/4	φ 25.4x6.0	20.0	18.0	Optically Contacted	600-2000

Cemented & Optically Contacted Zero Order

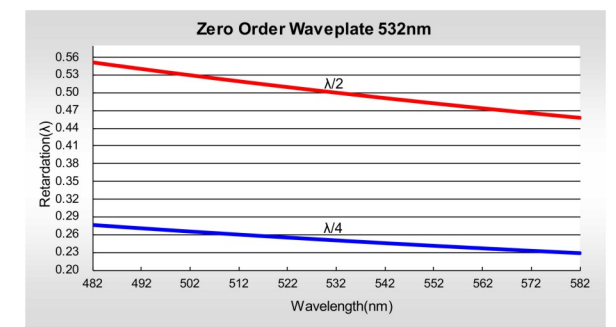
Zero order waveplate is constructed by two quartz plates with their fast axis crossed. The difference in thickness between the two plates determines the retardance. Zero order waveplates offer a substantially lower dependence on temperature and wavelength change than multi-order waveplates.

- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Both Sides AR Coated
- RoHS Compliant



Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm(not for cemented type)
Parallelism	<1 arc second(Single Quartz Plate)
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	Cemented: >500mJ/cm ² , 20ns, 20Hz @1064nm Optically Contacted: >5J/cm ² , 20ns, 20Hz @1064nm

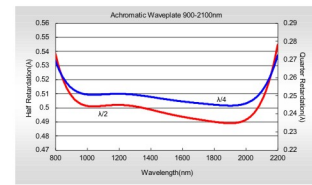
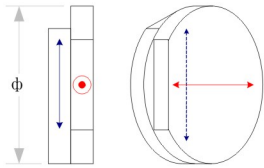




Achromatic Waveplate

Achromatic waveplate is similar to zero order waveplate except that the two plates are made from different birefringent crystals. Since the dispersion of the birefringence of two materials is different, it is possible to specify the retardation values at a broad wavelength range. So, the retardation will be less sensitive to wavelength change. In other words, it can be used at a broadband wavelength range.

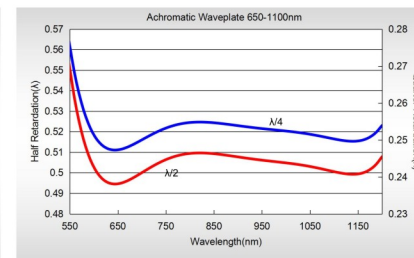
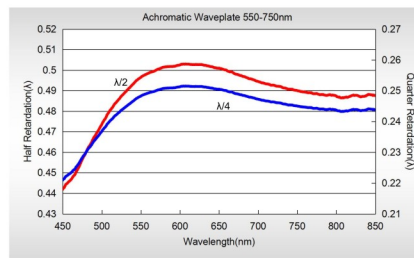
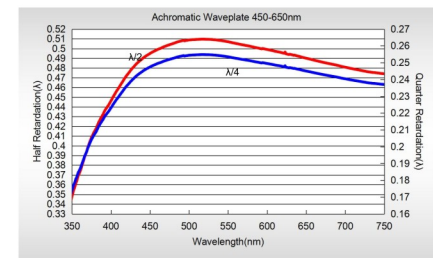
- Epoxy Cemented or Air Spaced available
- Very Broad Bandwidth
- Custom size available
- RoHS Compliant



Specifications

Material	Crystal Quartz+MgF ₂
Dimension Tolerance	+0/-0.2mm
Surface Quality	40/20 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/4@632.8nm (for air spaced type)
Parallelism	<10 arc seconds (for single plate)
Retardation Tolerance	<λ/100
Standard Wavelength	450-650nm 550-750nm 650-1100nm 900-2100nm
Coating	Both sides AR coated, R<1% per face
Damage Threshold	Cemented: >500mJ/cm ² , 20ns, 20Hz @1064nm Air spaced: >5J/cm ² , 20ns, 20Hz @1064nm

Retardation Curve



Standard Product-Achromatic Waveplate-Cemented

λ/2 Part No.	λ/4 Part No.	Diameter(mm)	Type	Wavelength(nm)
WPA2210-450-650	WPA4210-450-650	10.0	Cemented	450-650
WPA2215-450-650	WPA4215-450-650	15.0	Cemented	450-650
WPA2210-550-750	WPA4210-550-750	10.0	Cemented	550-750
WPA2215-550-750	WPA4215-550-750	15.0	Cemented	550-750
WPA2210-650-1100	WPA4210-650-1100	10.0	Cemented	650-1100
WPA2215-650-1100	WPA4215-650-1100	15.0	Cemented	650-1100
WPA2210-900-2100	WPA4210-900-2100	10.0	Cemented	900-2100
WPA2215-900-2100	WPA4215-900-2100	15.0	Cemented	900-2100

Standard Product-Achromatic Waveplate-Air Spaced

λ/2 Part No.	λ/4 Part No.	Mount Diameter(mm)	Mount Thickness(mm)	CA(mm)	Type	Wavelength(nm)
WPA2420-450-650	WPA4420-450-650	25.4	6.0	18.0	Air Spaced	450-650
WPA2420-550-750	WPA4420-550-750	25.4	6.0	18.0	Air Spaced	550-750
WPA2420-650-1100	WPA4420-650-1100	25.4	6.0	18.0	Air Spaced	650-1100
WPA2420-900-2100	WPA4420-900-2100	25.4	6.0	18.0	Air Spaced	900-2100

Order Information

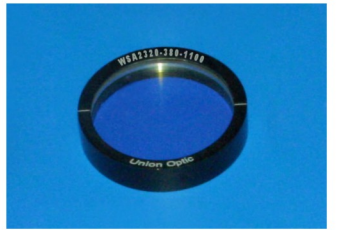
WPA2210-650-1100 — M25.4 — Part No.-Mount Diameter



Super Achromatic Waveplate

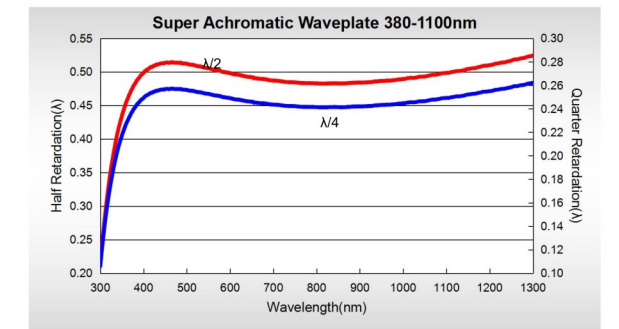
Super Achromatic Waveplate is similar to achromatic waveplate but providing a flat retardance over a super broadband wavelength range. Normal achromatic waveplate consists of one quartz plate and one MgF₂ plate, which has only few hundreds of nanometer wavelength range. Union Optic's super achromatic waveplate is made from three material, quartz, MgF₂ and sapphire, which can provide flat retardance on a broader wavelength range.

- Flat Retardance Over a Super Broadband Range
- Optically Contacted, Epoxy Free
- Custom Size & Wavelength Available
- RoHS Compliant



Specifications

Material	Crystal Quartz+MgF ₂ +Sapphire
Dimension Tolerance	+0/-0.2mm
Surface Quality	60/40 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/4@632.8nm
Parallelism	<10 arc seconds (for single plate)
Retardation Tolerance	<λ/100
Standard Wave	λ/2, λ/4
Standard Wavelength	380-1100nm, 600-2000nm
Coating	Upon request
Damage Threshold	>2J/cm ² , 20ns, 20Hz@1064nm



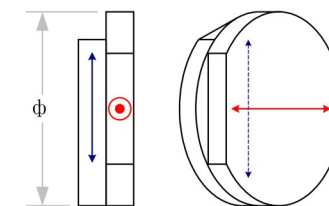
Standard Product-Super Achromatic Waveplate

Part No.	Retardation	Mount(mm)	Waveplate Diameter(mm)	CA(mm)	Type	Wavelength(nm)
WSA4320-380-1100-M25.4	λ/4	φ 25.4x6.0	20.0	18.0	Optically Contacted	380-1100
WSA4320-600-2000-M25.4	λ/4	φ 25.4x6.0	20.0	18.0	Optically Contacted	600-2000

Cemented & Optically Contacted Zero Order

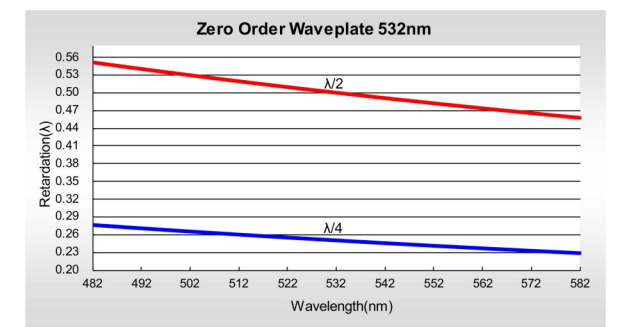
Zero order waveplate is constructed by two quartz plates with their fast axis crossed. The difference in thickness between the two plates determines the retardance. Zero order waveplates offer a substantially lower dependence on temperature and wavelength change than multi-order waveplates.

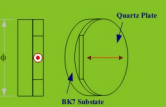
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Both Sides AR Coated
- RoHS Compliant



Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm(not for cemented type)
Parallelism	<1 arc second(Single Quartz Plate)
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	Cemented: >500mJ/cm ² , 20ns, 20Hz @1064nm Optically Contacted: >5J/cm ² , 20ns, 20Hz @1064nm





Cemented & Optically Contacted Zero Order Waveplate

Standard Product-Optically Contacted Zero Order Waveplate

Φ 10.0mm		Φ 12.7mm		Φ 20.0mm		Φ 25.4mm		Wavelength (nm)
λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	
WPZ2310-248	WPZ4310-248	WPZ2312-248	WPZ4312-248	WPZ2320-248	WPZ4320-248	WPZ2325-248	WPZ4325-248	248
WPZ2310-266	WPZ4310-266	WPZ2312-266	WPZ4312-266	WPZ2320-266	WPZ4320-266	WPZ2325-266	WPZ4325-266	266
WPZ2310-355	WPZ4310-355	WPZ2312-355	WPZ4312-355	WPZ2320-355	WPZ4320-355	WPZ2325-355	WPZ4325-355	355
WPZ2310-405	WPZ4310-405	WPZ2312-405	WPZ4312-405	WPZ2320-405	WPZ4320-405	WPZ2325-405	WPZ4325-405	405
WPZ2310-488	WPZ4310-488	WPZ2312-488	WPZ4312-488	WPZ2320-488	WPZ4320-488	WPZ2325-488	WPZ4325-488	488
WPZ2310-532	WPZ4310-532	WPZ2312-532	WPZ4312-532	WPZ2320-532	WPZ4320-532	WPZ2325-532	WPZ4325-532	532
WPZ2310-633	WPZ4310-633	WPZ2312-633	WPZ4312-633	WPZ2320-633	WPZ4320-633	WPZ2325-633	WPZ4325-633	633
WPZ2310-780	WPZ4310-780	WPZ2312-780	WPZ4312-780	WPZ2320-780	WPZ4320-780	WPZ2325-780	WPZ4325-780	780
WPZ2310-795	WPZ4310-795	WPZ2312-795	WPZ4312-795	WPZ2320-795	WPZ4320-795	WPZ2325-795	WPZ4325-795	795
WPZ2310-852	WPZ4310-852	WPZ2312-852	WPZ4312-852	WPZ2320-852	WPZ4320-852	WPZ2325-852	WPZ4325-852	852
WPZ2310-894	WPZ4310-894	WPZ2312-894	WPZ4312-894	WPZ2320-894	WPZ4320-894	WPZ2325-894	WPZ4325-894	894
WPZ2310-980	WPZ4310-980	WPZ2312-980	WPZ4312-980	WPZ2320-980	WPZ4320-980	WPZ2325-980	WPZ4325-980	980
WPZ2310-1030	WPZ4310-1030	WPZ2312-1030	WPZ4312-1030	WPZ2320-1030	WPZ4320-1030	WPZ2325-1030	WPZ4325-1030	1030
WPZ2310-1064	WPZ4310-1064	WPZ2312-1064	WPZ4312-1064	WPZ2320-1064	WPZ4320-1064	WPZ2325-1064	WPZ4325-1064	1064
WPZ2310-1550	WPZ4310-1550	WPZ2312-1550	WPZ4312-1550	WPZ2320-1550	WPZ4320-1550	WPZ2325-1550	WPZ4325-1550	1550
WPZ2310-2020	WPZ4310-2020	WPZ2312-2020	WPZ4312-2020	WPZ2320-2020	WPZ4320-2020	WPZ2325-2020	WPZ4325-2020	2020

Standard Product-Cemented Zero Order Waveplate

Φ 25.4mm		Φ 38.1mm		Φ 50.8mm		Wavelength (nm)
λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	
WPZ2225-405	WPZ4225-405	WPZ2238-405	WPZ4238-405	WPZ2250-405	WPZ4250-405	405
WPZ2225-633	WPZ4225-633	WPZ2238-633	WPZ4238-633	WPZ2250-633	WPZ4250-633	633
WPZ2225-780	WPZ4225-780	WPZ2238-780	WPZ4238-780	WPZ2250-780	WPZ4250-780	780
WPZ2225-795	WPZ4225-795	WPZ2238-795	WPZ4238-795	WPZ2250-795	WPZ4250-795	795
WPZ2225-852	WPZ4225-852	WPZ2238-852	WPZ4238-852	WPZ2250-852	WPZ4250-852	852
WPZ2225-894	WPZ4225-894	WPZ2238-894	WPZ4238-894	WPZ2250-894	WPZ4250-894	894
WPZ2225-1310	WPZ4225-1310	WPZ2238-1310	WPZ4238-1310	WPZ2250-1310	WPZ4250-1310	1310
WPZ2225-1550	WPZ4225-1550	WPZ2238-1550	WPZ4238-1550	WPZ2250-1550	WPZ4250-1550	1550

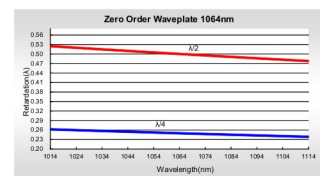
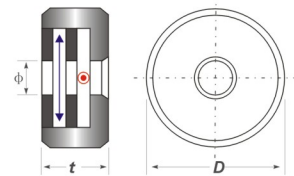
Order Information

WPZ2312-780 — M25.4 — Part No.-Mount Diameter

Air Spaced Zero Order Waveplate

Air spaced zero order waveplate is constructed by two quartz plates installed in a mount, to form a air gap between the two quartz plates. The difference in thickness between the two plates determines the retardance. Zero order waveplates offer a substantially lower dependence on temperature and wavelength change than multi-order waveplates.

- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- AR coated and Mounted
- RoHS Compliant



Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second(Single Quartz Plate)
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	>10J/cm ² , 20ns, 20Hz @1064nm

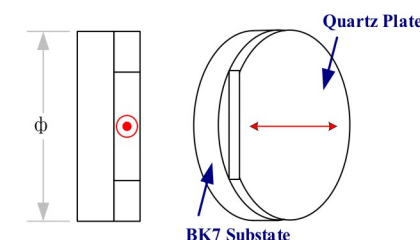
Standard Product-Air Spaced Zero Order Waveplate

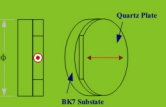
λ /2 Part No.	λ /4 Part No.	Mount Diameter(mm)	Mount Thickness(mm)	CA(mm)	Type	Wavelength(nm)
WPZ2410-266	WPZ4410-266	25.4	6.0	8.0	Air Spaced	266
WPZ2412-266	WPZ4412-266	25.4	6.0	11.5	Air Spaced	266
WPZ2420-266	WPZ4420-266	25.4	6.0	18.0	Air Spaced	266
WPZ2425-266	WPZ4425-266	30.0	6.0	22.9	Air Spaced	266
WPZ2410-355	WPZ4410-355	25.4	6.0	8.0	Air Spaced	355
WPZ2412-355	WPZ4412-355	25.4	6.0	11.5	Air Spaced	355
WPZ2420-355	WPZ4420-355	25.4	6.0	18.0	Air Spaced	355
WPZ2425-355	WPZ4425-355	30.0	6.0	22.9	Air Spaced	355
WPZ2410-405	WPZ4410-405	25.4	6.0	8.0	Air Spaced	405
WPZ2412-405	WPZ4412-405	25.4	6.0	11.5	Air Spaced	405
WPZ2420-405	WPZ4420-405	25.4	6.0	18.0	Air Spaced	405
WPZ2425-405	WPZ4425-405	30.0	6.0	22.9	Air Spaced	405
WPZ2410-488	WPZ4410-488	25.4	6.0	8.0	Air Spaced	488
WPZ2412-488	WPZ4412-488	25.4	6.0	11.5	Air Spaced	488
WPZ2420-488	WPZ4420-488	25.4	6.0	18.0	Air Spaced	488
WPZ2425-488	WPZ4425-488	30.0	6.0	22.9	Air Spaced	488
WPZ2410-532	WPZ4410-532	25.4	6.0	8.0	Air Spaced	532
WPZ2412-532	WPZ4412-532	25.4	6.0	11.5	Air Spaced	532
WPZ2420-532	WPZ4420-532	25.4	6.0	18.0	Air Spaced	532
WPZ2425-532	WPZ4425-532	30.0	6.0	22.9	Air Spaced	532
WPZ2410-980	WPZ4410-980	25.4	6.0	8.0	Air Spaced	980
WPZ2412-980	WPZ4412-980	25.4	6.0	11.5	Air Spaced	980
WPZ2420-980	WPZ4420-980	25.4	6.0	18.0	Air Spaced	980
WPZ2425-980	WPZ4425-980	30.0	6.0	22.9	Air Spaced	980
WPZ2410-1030	WPZ4410-1030	25.4	6.0	8.0	Air Spaced	1030
WPZ2412-1030	WPZ4412-1030	25.4	6.0	11.5	Air Spaced	1030
WPZ2420-1030	WPZ4420-1030	25.4	6.0	18.0	Air Spaced	1030
WPZ2425-1030	WPZ4425-1030	30.0	6.0	22.9	Air Spaced	1030
WPZ2410-1053	WPZ4410-1053	25.4	6.0	8.0	Air Spaced	1053
WPZ2412-1053	WPZ4412-1053	25.4	6.0	11.5	Air Spaced	1053
WPZ2420-1053	WPZ4420-1053	25.4	6.0	18.0	Air Spaced	1053
WPZ2425-1053	WPZ4425-1053	30.0	6.0	22.9	Air Spaced	1053
WPZ2410-1064	WPZ4410-1064	25.4	6.0	8.0	Air Spaced	1064
WPZ2412-1064	WPZ4412-1064	25.4	6.0	11.5	Air Spaced	1064
WPZ2420-1064	WPZ4420-1064	25.4	6.0	18.0	Air Spaced	1064
WPZ2425-1064	WPZ4425-1064	30.0	6.0	22.9	Air Spaced	1064

True Zero Order Waveplate

The thickness of a true zero order quartz plate is very thin, it is very easily damaged. In order to solve this problem, we can cement the thin quartz plate on a BK7 substrate to increase the strength.

- Standard Thickness: 1.1±0.2mm
- Epoxy Cemented
- Moderate Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Good wavefront and parallelism
- RoHS Compliant





Cemented & Optically Contacted Zero Order Waveplate

Standard Product-Optically Contacted Zero Order Waveplate

Φ 10.0mm		Φ 12.7mm		Φ 20.0mm		Φ 25.4mm		Wavelength (nm)
λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	
WPZ2310-248	WPZ4310-248	WPZ2312-248	WPZ4312-248	WPZ2320-248	WPZ4320-248	WPZ2325-248	WPZ4325-248	248
WPZ2310-266	WPZ4310-266	WPZ2312-266	WPZ4312-266	WPZ2320-266	WPZ4320-266	WPZ2325-266	WPZ4325-266	266
WPZ2310-355	WPZ4310-355	WPZ2312-355	WPZ4312-355	WPZ2320-355	WPZ4320-355	WPZ2325-355	WPZ4325-355	355
WPZ2310-405	WPZ4310-405	WPZ2312-405	WPZ4312-405	WPZ2320-405	WPZ4320-405	WPZ2325-405	WPZ4325-405	405
WPZ2310-488	WPZ4310-488	WPZ2312-488	WPZ4312-488	WPZ2320-488	WPZ4320-488	WPZ2325-488	WPZ4325-488	488
WPZ2310-532	WPZ4310-532	WPZ2312-532	WPZ4312-532	WPZ2320-532	WPZ4320-532	WPZ2325-532	WPZ4325-532	532
WPZ2310-633	WPZ4310-633	WPZ2312-633	WPZ4312-633	WPZ2320-633	WPZ4320-633	WPZ2325-633	WPZ4325-633	633
WPZ2310-780	WPZ4310-780	WPZ2312-780	WPZ4312-780	WPZ2320-780	WPZ4320-780	WPZ2325-780	WPZ4325-780	780
WPZ2310-795	WPZ4310-795	WPZ2312-795	WPZ4312-795	WPZ2320-795	WPZ4320-795	WPZ2325-795	WPZ4325-795	795
WPZ2310-852	WPZ4310-852	WPZ2312-852	WPZ4312-852	WPZ2320-852	WPZ4320-852	WPZ2325-852	WPZ4325-852	852
WPZ2310-894	WPZ4310-894	WPZ2312-894	WPZ4312-894	WPZ2320-894	WPZ4320-894	WPZ2325-894	WPZ4325-894	894
WPZ2310-980	WPZ4310-980	WPZ2312-980	WPZ4312-980	WPZ2320-980	WPZ4320-980	WPZ2325-980	WPZ4325-980	980
WPZ2310-1030	WPZ4310-1030	WPZ2312-1030	WPZ4312-1030	WPZ2320-1030	WPZ4320-1030	WPZ2325-1030	WPZ4325-1030	1030
WPZ2310-1064	WPZ4310-1064	WPZ2312-1064	WPZ4312-1064	WPZ2320-1064	WPZ4320-1064	WPZ2325-1064	WPZ4325-1064	1064
WPZ2310-1550	WPZ4310-1550	WPZ2312-1550	WPZ4312-1550	WPZ2320-1550	WPZ4320-1550	WPZ2325-1550	WPZ4325-1550	1550
WPZ2310-2020	WPZ4310-2020	WPZ2312-2020	WPZ4312-2020	WPZ2320-2020	WPZ4320-2020	WPZ2325-2020	WPZ4325-2020	2020

Standard Product-Cemented Zero Order Waveplate

Φ 25.4mm		Φ 38.1mm		Φ 50.8mm		Wavelength (nm)
λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	λ/2 Part No.	λ/4 Part No.	
WPZ2225-405	WPZ4225-405	WPZ2238-405	WPZ4238-405	WPZ2250-405	WPZ4250-405	405
WPZ2225-633	WPZ4225-633	WPZ2238-633	WPZ4238-633	WPZ2250-633	WPZ4250-633	633
WPZ2225-780	WPZ4225-780	WPZ2238-780	WPZ4238-780	WPZ2250-780	WPZ4250-780	780
WPZ2225-795	WPZ4225-795	WPZ2238-795	WPZ4238-795	WPZ2250-795	WPZ4250-795	795
WPZ2225-852	WPZ4225-852	WPZ2238-852	WPZ4238-852	WPZ2250-852	WPZ4250-852	852
WPZ2225-894	WPZ4225-894	WPZ2238-894	WPZ4238-894	WPZ2250-894	WPZ4250-894	894
WPZ2225-1310	WPZ4225-1310	WPZ2238-1310	WPZ4238-1310	WPZ2250-1310	WPZ4250-1310	1310
WPZ2225-1550	WPZ4225-1550	WPZ2238-1550	WPZ4238-1550	WPZ2250-1550	WPZ4250-1550	1550

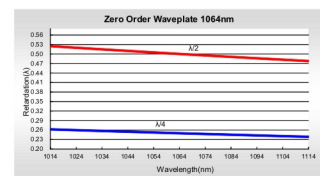
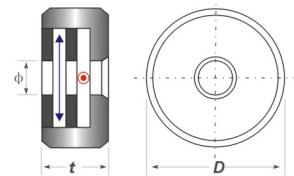
Order Information

WPZ2312-780 — M25.4 — Part No.-Mount Diameter

Air Spaced Zero Order Waveplate

Air spaced zero order waveplate is constructed by two quartz plates installed in a mount, to form a air gap between the two quartz plates. The difference in thickness between the two plates determines the retardance. Zero order waveplates offer a substantially lower dependence on temperature and wavelength change than multi-order waveplates.

- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- AR coated and Mounted
- RoHS Compliant



Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second(Single Quartz Plate)
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	>10J/cm ² , 20ns, 20Hz @1064nm

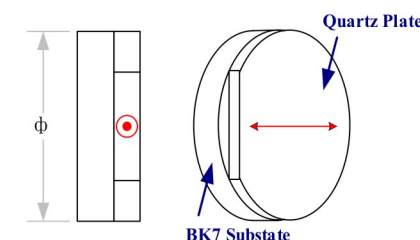
Standard Product-Air Spaced Zero Order Waveplate

λ /2 Part No.	λ /4 Part No.	Mount Diameter(mm)	Mount Thickness(mm)	CA(mm)	Type	Wavelength(nm)
WPZ2410-266	WPZ4410-266	25.4	6.0	8.0	Air Spaced	266
WPZ2412-266	WPZ4412-266	25.4	6.0	11.5	Air Spaced	266
WPZ2420-266	WPZ4420-266	25.4	6.0	18.0	Air Spaced	266
WPZ2425-266	WPZ4425-266	30.0	6.0	22.9	Air Spaced	266
WPZ2410-355	WPZ4410-355	25.4	6.0	8.0	Air Spaced	355
WPZ2412-355	WPZ4412-355	25.4	6.0	11.5	Air Spaced	355
WPZ2420-355	WPZ4420-355	25.4	6.0	18.0	Air Spaced	355
WPZ2425-355	WPZ4425-355	30.0	6.0	22.9	Air Spaced	355
WPZ2410-405	WPZ4410-405	25.4	6.0	8.0	Air Spaced	405
WPZ2412-405	WPZ4412-405	25.4	6.0	11.5	Air Spaced	405
WPZ2420-405	WPZ4420-405	25.4	6.0	18.0	Air Spaced	405
WPZ2425-405	WPZ4425-405	30.0	6.0	22.9	Air Spaced	405
WPZ2410-488	WPZ4410-488	25.4	6.0	8.0	Air Spaced	488
WPZ2412-488	WPZ4412-488	25.4	6.0	11.5	Air Spaced	488
WPZ2420-488	WPZ4420-488	25.4	6.0	18.0	Air Spaced	488
WPZ2425-488	WPZ4425-488	30.0	6.0	22.9	Air Spaced	488
WPZ2410-532	WPZ4410-532	25.4	6.0	8.0	Air Spaced	532
WPZ2412-532	WPZ4412-532	25.4	6.0	11.5	Air Spaced	532
WPZ2420-532	WPZ4420-532	25.4	6.0	18.0	Air Spaced	532
WPZ2425-532	WPZ4425-532	30.0	6.0	22.9	Air Spaced	532
WPZ2410-980	WPZ4410-980	25.4	6.0	8.0	Air Spaced	980
WPZ2412-980	WPZ4412-980	25.4	6.0	11.5	Air Spaced	980
WPZ2420-980	WPZ4420-980	25.4	6.0	18.0	Air Spaced	980
WPZ2425-980	WPZ4425-980	30.0	6.0	22.9	Air Spaced	980
WPZ2410-1030	WPZ4410-1030	25.4	6.0	8.0	Air Spaced	1030
WPZ2412-1030	WPZ4412-1030	25.4	6.0	11.5	Air Spaced	1030
WPZ2420-1030	WPZ4420-1030	25.4	6.0	18.0	Air Spaced	1030
WPZ2425-1030	WPZ4425-1030	30.0	6.0	22.9	Air Spaced	1030
WPZ2410-1053	WPZ4410-1053	25.4	6.0	8.0	Air Spaced	1053
WPZ2412-1053	WPZ4412-1053	25.4	6.0	11.5	Air Spaced	1053
WPZ2420-1053	WPZ4420-1053	25.4	6.0	18.0	Air Spaced	1053
WPZ2425-1053	WPZ4425-1053	30.0	6.0	22.9	Air Spaced	1053
WPZ2410-1064	WPZ4410-1064	25.4	6.0	8.0	Air Spaced	1064
WPZ2412-1064	WPZ4412-1064	25.4	6.0	11.5	Air Spaced	1064
WPZ2420-1064	WPZ4420-1064	25.4	6.0	18.0	Air Spaced	1064
WPZ2425-1064	WPZ4425-1064	30.0	6.0	22.9	Air Spaced	1064

True Zero Order Waveplate

The thickness of a true zero order quartz plate is very thin, it is very easily damaged. In order to solve this problem, we can cement the thin quartz plate on a BK7 substrate to increase the strength.

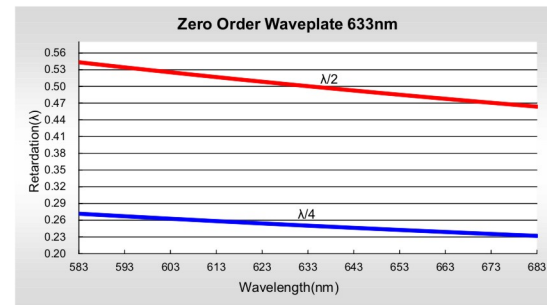
- Standard Thickness: 1.1±0.2mm
- Epoxy Cemented
- Moderate Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Good wavefront and parallelism
- RoHS Compliant





Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	>500mJ/cm², 20ns, 20Hz @1064nm



Standard Product-True Zero Order Waveplate

λ/2 Part No.	λ/4 Part No.	Diameter(mm)	Type	Wavelength(nm)
WPF2210-633	WPF4210-633	10.0	Cemented	633
WPF2212-633	WPF4212-633	12.7	Cemented	633
WPF2220-633	WPF4220-633	20.0	Cemented	633
WPF2225-633	WPF4225-633	25.4	Cemented	633
WPF2238-633	WPF4238-633	38.1	Cemented	633
WPF2250-633	WPF4250-633	50.8	Cemented	633
WPF2210-780	WPF4210-780	10.0	Cemented	780
WPF2212-780	WPF4212-780	12.7	Cemented	780
WPF2220-780	WPF4220-780	20.0	Cemented	780
WPF2225-780	WPF4225-780	25.4	Cemented	780
WPF2238-780	WPF4238-780	38.1	Cemented	780
WPF2250-780	WPF4250-780	50.8	Cemented	780
WPF2210-795	WPF4210-795	10.0	Cemented	795
WPF2212-795	WPF4212-795	12.7	Cemented	795
WPF2220-795	WPF4220-795	20.0	Cemented	795
WPF2225-795	WPF4225-795	25.4	Cemented	795
WPF2238-795	WPF4238-795	38.1	Cemented	795
WPF2250-795	WPF4250-795	50.8	Cemented	795
WPF2210-852	WPF4210-852	10.0	Cemented	852
WPF2212-852	WPF4212-852	12.7	Cemented	852
WPF2220-852	WPF4220-852	20.0	Cemented	852
WPF2225-852	WPF4225-852	25.4	Cemented	852
WPF2238-852	WPF4238-852	38.1	Cemented	852
WPF2250-852	WPF4250-852	50.8	Cemented	852
WPF2210-894	WPF4210-894	10.0	Cemented	894
WPF2212-894	WPF4212-894	12.7	Cemented	894
WPF2220-894	WPF4220-894	20.0	Cemented	894
WPF2225-894	WPF4225-894	25.4	Cemented	894
WPF2238-894	WPF4238-894	38.1	Cemented	894
WPF2250-894	WPF4250-894	50.8	Cemented	894
WPF2210-1310	WPF4210-1310	10.0	Cemented	1310
WPF2212-1310	WPF4212-1310	12.7	Cemented	1310
WPF2220-1310	WPF4220-1310	20.0	Cemented	1310
WPF2225-1310	WPF4225-1310	25.4	Cemented	1310
WPF2238-1310	WPF4238-1310	38.1	Cemented	1310
WPF2250-1310	WPF4250-1310	50.8	Cemented	1310
WPF2210-1550	WPF4210-1550	10.0	Cemented	1550
WPF2212-1550	WPF4212-1550	12.7	Cemented	1550
WPF2220-1550	WPF4220-1550	20.0	Cemented	1550
WPF2225-1550	WPF4225-1550	25.4	Cemented	1550
WPF2238-1550	WPF4238-1550	38.1	Cemented	1550
WPF2250-1550	WPF4250-1550	50.8	Cemented	1550

Order Information

WPF4220-780 — M25.4

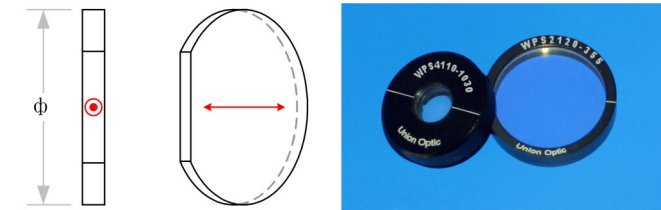
➡ Part No.-Mount Diameter



Single Plate High Power Waveplate

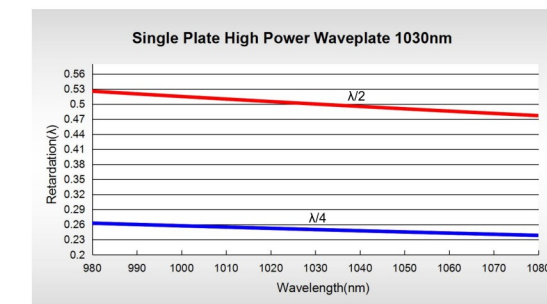
Union Optic can offer single plate high power waveplate now, due to our unique technology, we can make thickness down to 20 microns. Thanks to her high damage threshold, single plate high power waveplate is normally used in high power application.

- Mounted in Ø25.4x6mm Black Anodized Ring Mount
- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Wide Acceptance Angle
- Thickness >=0.02mm
- RoHS Compliant



Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Acceptance Angle	10deg
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	>10J/cm², 20ns, 20Hz @1064nm



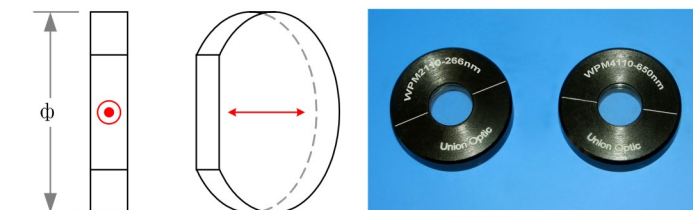
Standard Product-Single Plate High Power Waveplate

Part No.	Retardation	Mount(mm)	CA(mm)	Order	Waveplate Thickness(mm)	Wavelength(nm)
WPS2120-355-M25.4	λ/2	φ 25.4x6.0	18.0	1	0.054	355
WPS2120-532-M25.4	λ/2	φ 25.4x6.0	18.0	0	0.029	532
WPS2120-1030-M25.4	λ/2	φ 25.4x6.0	18.0	0	0.059	1030
WPS2120-1064-M25.4	λ/2	φ 25.4x6.0	18.0	0	0.061	1064
WPS4120-355-M25.4	λ/4	φ 25.4x6.0	18.0	1	0.027	355
WPS4120-532-M25.4	λ/4	φ 25.4x6.0	18.0	1	0.043	532
WPS4120-1030-M25.4	λ/4	φ 25.4x6.0	18.0	0	0.029	1030
WPS4120-1064-M25.4	λ/4	φ 25.4x6.0	18.0	0	0.03	1064

Multi Order Waveplate

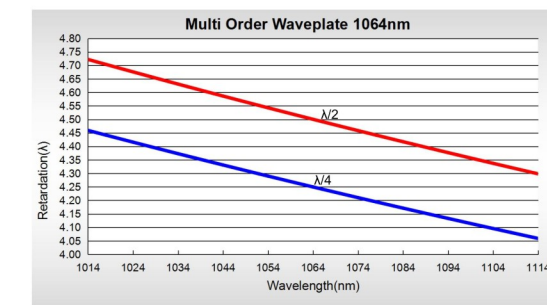
Multiple order waveplate means the retardance of a light path will undergo a certain number of full wavelength shifts in addition to the fractional design retardance. The thickness of multi order waveplate is always around 0.5mm. Compared with zero order waveplate, multi order waveplate is more sensitive to wavelength and temperature changes. However, they are less expensive and widely used in many applications where the increased sensitivities are not critical.

- Thickness: 0.3-0.5 mm
- High Damage Threshold
- Better wavefront and parallelism
- Low Cost
- RoHS Compliant



Specifications

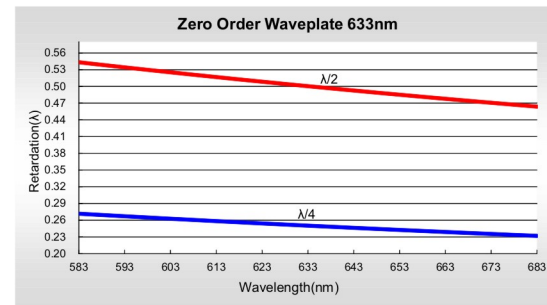
Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Retardation Tolerance	<λ/100
AR Coating	R<0.25%@central wavelength
Damage Threshold	>10J/cm², 20ns, 20Hz @1064nm





Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	>500mJ/cm ² , 20ns, 20Hz @1064nm



Standard Product-True Zero Order Waveplate

λ/2 Part No.	λ/4 Part No.	Diameter(mm)	Type	Wavelength(nm)
WPF2210-633	WPF4210-633	10.0	Cemented	633
WPF2212-633	WPF4212-633	12.7	Cemented	633
WPF2220-633	WPF4220-633	20.0	Cemented	633
WPF2225-633	WPF4225-633	25.4	Cemented	633
WPF2238-633	WPF4238-633	38.1	Cemented	633
WPF2250-633	WPF4250-633	50.8	Cemented	633
WPF2210-780	WPF4210-780	10.0	Cemented	780
WPF2212-780	WPF4212-780	12.7	Cemented	780
WPF2220-780	WPF4220-780	20.0	Cemented	780
WPF2225-780	WPF4225-780	25.4	Cemented	780
WPF2238-780	WPF4238-780	38.1	Cemented	780
WPF2250-780	WPF4250-780	50.8	Cemented	780
WPF2210-795	WPF4210-795	10.0	Cemented	795
WPF2212-795	WPF4212-795	12.7	Cemented	795
WPF2220-795	WPF4220-795	20.0	Cemented	795
WPF2225-795	WPF4225-795	25.4	Cemented	795
WPF2238-795	WPF4238-795	38.1	Cemented	795
WPF2250-795	WPF4250-795	50.8	Cemented	795
WPF2210-852	WPF4210-852	10.0	Cemented	852
WPF2212-852	WPF4212-852	12.7	Cemented	852
WPF2220-852	WPF4220-852	20.0	Cemented	852
WPF2225-852	WPF4225-852	25.4	Cemented	852
WPF2238-852	WPF4238-852	38.1	Cemented	852
WPF2250-852	WPF4250-852	50.8	Cemented	852
WPF2210-894	WPF4210-894	10.0	Cemented	894
WPF2212-894	WPF4212-894	12.7	Cemented	894
WPF2220-894	WPF4220-894	20.0	Cemented	894
WPF2225-894	WPF4225-894	25.4	Cemented	894
WPF2238-894	WPF4238-894	38.1	Cemented	894
WPF2250-894	WPF4250-894	50.8	Cemented	894
WPF2210-1310	WPF4210-1310	10.0	Cemented	1310
WPF2212-1310	WPF4212-1310	12.7	Cemented	1310
WPF2220-1310	WPF4220-1310	20.0	Cemented	1310
WPF2225-1310	WPF4225-1310	25.4	Cemented	1310
WPF2238-1310	WPF4238-1310	38.1	Cemented	1310
WPF2250-1310	WPF4250-1310	50.8	Cemented	1310
WPF2210-1550	WPF4210-1550	10.0	Cemented	1550
WPF2212-1550	WPF4212-1550	12.7	Cemented	1550
WPF2220-1550	WPF4220-1550	20.0	Cemented	1550
WPF2225-1550	WPF4225-1550	25.4	Cemented	1550
WPF2238-1550	WPF4238-1550	38.1	Cemented	1550
WPF2250-1550	WPF4250-1550	50.8	Cemented	1550

Order Information

WPF4220-780 M25.4

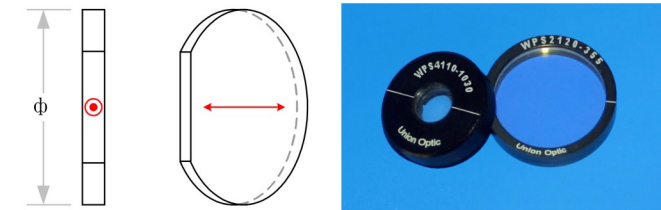
Part No.-Mount Diameter



Single Plate High Power Waveplate

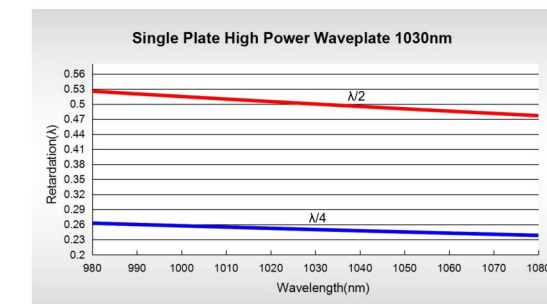
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- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Wide Acceptance Angle
- Thickness >=0.02mm
- RoHS Compliant



Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Acceptance Angle	10deg
Retardation Tolerance	<λ/300
AR Coating	R<0.25%@central wavelength
Damage Threshold	>10J/cm ² , 20ns, 20Hz @1064nm



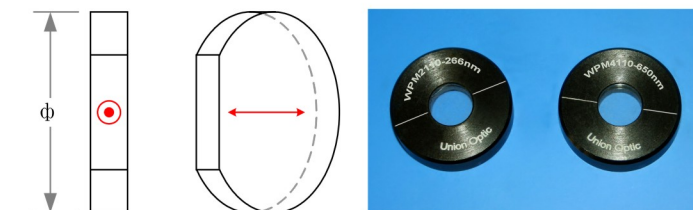
Standard Product-Single Plate High Power Waveplate

Part No.	Retardation	Mount(mm)	CA(mm)	Order	Waveplate Thickness(mm)	Wavelength(nm)
WPS2120-355-M25.4	λ/2	φ 25.4x6.0	18.0	1	0.054	355
WPS2120-532-M25.4	λ/2	φ 25.4x6.0	18.0	0	0.029	532
WPS2120-1030-M25.4	λ/2	φ 25.4x6.0	18.0	0	0.059	1030
WPS2120-1064-M25.4	λ/2	φ 25.4x6.0	18.0	0	0.061	1064
WPS4120-355-M25.4	λ/4	φ 25.4x6.0	18.0	1	0.027	355
WPS4120-532-M25.4	λ/4	φ 25.4x6.0	18.0	1	0.043	532
WPS4120-1030-M25.4	λ/4	φ 25.4x6.0	18.0	0	0.029	1030
WPS4120-1064-M25.4	λ/4	φ 25.4x6.0	18.0	0	0.03	1064

Multi Order Waveplate

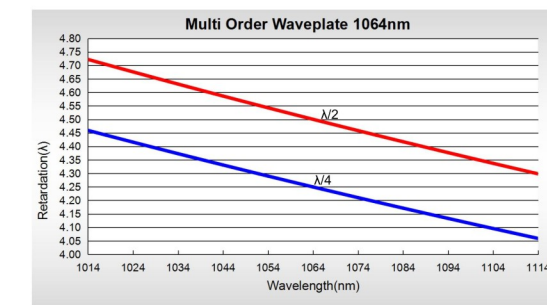
Multiple order waveplate means the retardance of a light path will undergo a certain number of full wavelength shifts in addition to the fractional design retardance. The thickness of multi order waveplate is always around 0.5mm. Compared with zero order waveplate, multi order waveplate is more sensitive to wavelength and temperature changes. However, they are less expensive and widely used in many applications where the increased sensitivities are not critical.

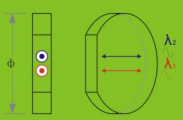
- Thickness: 0.3-0.5 mm
- High Damage Threshold
- Better wavefront and parallelism
- Low Cost
- RoHS Compliant



Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Retardation Tolerance	<λ/100
AR Coating	R<0.25%@central wavelength
Damage Threshold	>10J/cm ² , 20ns, 20Hz @1064nm





Standard Product-Multi Order Waveplate

λ /2 Part No.	λ /4 Part No.	Diameter(mm)	Wavelength(nm)
WPM2110-266	WPM4110-266	10.0	266
WPM2112-266	WPM4112-266	12.7	266
WPM2120-266	WPM4120-266	20.0	266
WPM2125-266	WPM4125-266	25.4	266
WPM2138-266	WPM4138-266	38.1	266
WPM2150-266	WPM4150-266	50.8	266
WPM2110-355	WPM4110-355	10.0	355
WPM2112-355	WPM4112-355	12.7	355
WPM2120-355	WPM4120-355	20.0	355
WPM2125-355	WPM4125-355	25.4	355
WPM2138-355	WPM4138-355	38.1	355
WPM2150-355	WPM4150-355	50.8	355
WPM2110-405	WPM4110-405	10.0	405
WPM2112-405	WPM4112-405	12.7	405
WPM2120-405	WPM4120-405	20.0	405
WPM2125-405	WPM4125-405	25.4	405
WPM2138-405	WPM4138-405	38.1	405
WPM2150-405	WPM4150-405	50.8	405
WPM2110-488	WPM4110-488	10.0	488
WPM2112-488	WPM4112-488	12.7	488
WPM2120-488	WPM4120-488	20.0	488
WPM2125-488	WPM4125-488	25.4	488
WPM2138-488	WPM4138-488	38.1	488
WPM2150-488	WPM4150-488	50.8	488
WPM2110-532	WPM4110-532	10.0	532
WPM2112-532	WPM4112-532	12.7	532
WPM2120-532	WPM4120-532	20.0	532
WPM2125-532	WPM4125-532	25.4	532
WPM2138-532	WPM4138-532	38.1	532
WPM2150-532	WPM4150-532	50.8	532
WPM2110-633	WPM4110-633	10.0	633
WPM2112-633	WPM4112-633	12.7	633
WPM2120-633	WPM4120-633	20.0	633
WPM2125-633	WPM4125-633	25.4	633
WPM2138-633	WPM4138-633	38.1	633
WPM2150-633	WPM4150-633	50.8	633

λ /2 Part No.	λ /4 Part No.	Diameter(mm)	Wavelength(nm)
WPM2110-780	WPM4110-780	10.0	780
WPM2112-780	WPM4112-780	12.7	780
WPM2120-780	WPM4120-780	20.0	780
WPM2125-780	WPM4125-780	25.4	780
WPM2138-780	WPM4138-780	38.1	780
WPM2150-780	WPM4150-780	50.8	780
WPM2110-800	WPM4110-800	10.0	800
WPM2112-800	WPM4112-800	12.7	800
WPM2120-800	WPM4120-800	20.0	800
WPM2125-800	WPM4125-800	25.4	800
WPM2138-800	WPM4138-800	38.1	800
WPM2150-800	WPM4150-800	50.8	800
WPM2110-980	WPM4110-980	10.0	980
WPM2112-980	WPM4112-980	12.7	980
WPM2120-980	WPM4120-980	20.0	980
WPM2125-980	WPM4125-980	25.4	980
WPM2138-980	WPM4138-980	38.1	980
WPM2150-980	WPM4150-980	50.8	980
WPM2110-1030	WPM4110-1030	10.0	1030
WPM2112-1030	WPM4112-1030	12.7	1030
WPM2120-1030	WPM4120-1030	20.0	1030
WPM2125-1030	WPM4125-1030	25.4	1030
WPM2138-1030	WPM4138-1030	38.1	1030
WPM2150-1030	WPM4150-1030	50.8	1030
WPM2110-1064	WPM4110-1064	10.0	1064
WPM2112-1064	WPM4112-1064	12.7	1064
WPM2120-1064	WPM4120-1064	20.0	1064
WPM2125-1064	WPM4125-1064	25.4	1064
WPM2138-1064	WPM4138-1064	38.1	1064
WPM2150-1064	WPM4150-1064	50.8	1064
WPM2110-1550	WPM4110-1550	10.0	1550
WPM2112-1550	WPM4112-1550	12.7	1550
WPM2120-1550	WPM4120-1550	20.0	1550
WPM2125-1550	WPM4125-1550	25.4	1550
WPM2138-1550	WPM4138-1550	38.1	1550
WPM2150-1550	WPM4150-1550	50.8	1550

Order Information

WPM2112-355 — M25.4 — Part No.-Mount Diameter

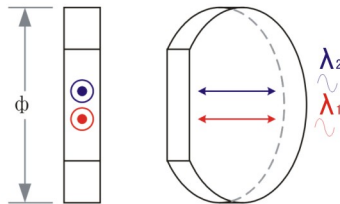
Dual Wavelength Waveplate

This waveplate is a special kind of multi order waveplate. Dual wavelength waveplate is designed to be used in dual wavelength setups, for example, it can be operated as a quarter waveplate @1064nm and as a half waveplate @532nm at the same time. It's always used to manage the states of polarization of laser beams to obtain maximum conversion efficiency.

- High damage threshold
- Thickness: <2.0mm
- RoHS Compliant

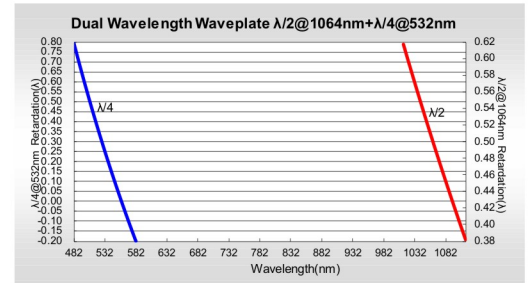
Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Retardation Tolerance	<λ/100
AR Coating	R<0.5%@two wavelengths
Damage Threshold	>5J/cm², 20ns, 20Hz @1064nm



Standard Product-Dual Wavelength Waveplate

Part No.	Retardation	Diameter(mm)
WPD0112-1521	λ/2@1064nm+λ@532nm	12.7
WPD0120-1521	λ/2@1064nm+λ@532nm	20.0
WPD0125-1521	λ/2@1064nm+λ@532nm	25.4
WPD0112-1512	λ@1064nm+λ/2@532nm	12.7
WPD0120-1512	λ@1064nm+λ/2@532nm	20.0
WPD0125-1512	λ@1064nm+λ/2@532nm	25.4
WPD0112-1524	λ/2@1064nm+λ/4@532nm	12.7
WPD0120-1524	λ/2@1064nm+λ/4@532nm	20.0
WPD0125-1524	λ/2@1064nm+λ/4@532nm	25.4
WPD0112-1542	λ/4@1064nm+λ/2@532nm	12.7
WPD0120-1542	λ/4@1064nm+λ/2@532nm	20.0
WPD0125-1542	λ/4@1064nm+λ/2@532nm	25.4
WPD0112-1541	λ/4@1064nm+λ@532nm	12.7
WPD0120-1541	λ/4@1064nm+λ@532nm	20.0
WPD0125-1541	λ/4@1064nm+λ@532nm	25.4



Order Information

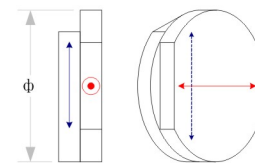
WPD0112-1521 — M25.4

Part No.-Mount Diameter

Middle Infrared Zero Order Waveplate

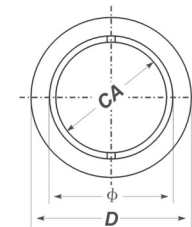
Middle Infrared zero order waveplate is constructed by two Magnesium Fluoride (MgF₂) plates with their fast axis crossed, the two plates are constructed by optically contacted method, the optical path is epoxy free. The difference in thickness between the two plates determines the retardance. Middle Infrared zero order waveplates is widely used in infrared applications, ideally for 2.5-6.0 micron range.

- Ideal for Applications in the 2.5-6.0μm Range
- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Both Sides AR Coated
- RoHS Compliant



Ring Mount for Waveplate

- Material: Black Anodized Aluminum
- Outer Diameter(D) Tolerance: ± 0.2mm
- Thickness Tolerance: ± 0.2mm
- Clear Aperture Tolerance(Φ): ± 0.2mm
- Custom size available

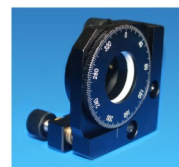


Standard Product-Ring Mount for Waveplate

Part No.	Mount Diameter D(mm)	Waveplate Diameter Φ(mm)	CA(mm)	Thickness(mm)
MSW9001	12.7	10.0	8.0	6.0
MSW9010	25.4	10.0	8.0	6.0
MSW9012	25.4	12.7	11.5	6.0
MSW9015	25.4	15.0	13.5	6.0
MSW9020	25.4	20.0	18.0	6.0
MSW9025	30.0	25.4	22.9	6.0

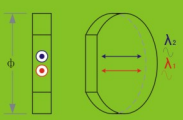
Rotator Mount for Waveplate

- Material: Black Anodized Aluminum
- Adjustment range: θ_x: ±360° θ_y: ±5° θ_z: ±5°
- Minimum reading: 2°



Standard Product-Rotator Mount for Waveplate

Part No.	Dimension(mm)	Optical Height (mm)	Optic Size (mm)	CA(mm)
OMPO12.7-1	58.0*58.0*41.0	35.0	Φ25.4*6.0	11.0
OMPO25.4-1	58.0*58.0*41.0	35.0	Φ25.4*6.0	23.0
OMPO30-1	66.0*66.0*41.0	39.0	Φ30.0*6.0	27.0



Standard Product-Multi Order Waveplate

λ /2 Part No.	λ /4 Part No.	Diameter(mm)	Wavelength(nm)
WPM2110-266	WPM4110-266	10.0	266
WPM2112-266	WPM4112-266	12.7	266
WPM2120-266	WPM4120-266	20.0	266
WPM2125-266	WPM4125-266	25.4	266
WPM2138-266	WPM4138-266	38.1	266
WPM2150-266	WPM4150-266	50.8	266
WPM2110-355	WPM4110-355	10.0	355
WPM2112-355	WPM4112-355	12.7	355
WPM2120-355	WPM4120-355	20.0	355
WPM2125-355	WPM4125-355	25.4	355
WPM2138-355	WPM4138-355	38.1	355
WPM2150-355	WPM4150-355	50.8	355
WPM2110-405	WPM4110-405	10.0	405
WPM2112-405	WPM4112-405	12.7	405
WPM2120-405	WPM4120-405	20.0	405
WPM2125-405	WPM4125-405	25.4	405
WPM2138-405	WPM4138-405	38.1	405
WPM2150-405	WPM4150-405	50.8	405
WPM2110-488	WPM4110-488	10.0	488
WPM2112-488	WPM4112-488	12.7	488
WPM2120-488	WPM4120-488	20.0	488
WPM2125-488	WPM4125-488	25.4	488
WPM2138-488	WPM4138-488	38.1	488
WPM2150-488	WPM4150-488	50.8	488
WPM2110-532	WPM4110-532	10.0	532
WPM2112-532	WPM4112-532	12.7	532
WPM2120-532	WPM4120-532	20.0	532
WPM2125-532	WPM4125-532	25.4	532
WPM2138-532	WPM4138-532	38.1	532
WPM2150-532	WPM4150-532	50.8	532
WPM2110-633	WPM4110-633	10.0	633
WPM2112-633	WPM4112-633	12.7	633
WPM2120-633	WPM4120-633	20.0	633
WPM2125-633	WPM4125-633	25.4	633
WPM2138-633	WPM4138-633	38.1	633
WPM2150-633	WPM4150-633	50.8	633

λ /2 Part No.	λ /4 Part No.	Diameter(mm)	Wavelength(nm)
WPM2110-780	WPM4110-780	10.0	780
WPM2112-780	WPM4112-780	12.7	780
WPM2120-780	WPM4120-780	20.0	780
WPM2125-780	WPM4125-780	25.4	780
WPM2138-780	WPM4138-780	38.1	780
WPM2150-780	WPM4150-780	50.8	780
WPM2110-800	WPM4110-800	10.0	800
WPM2112-800	WPM4112-800	12.7	800
WPM2120-800	WPM4120-800	20.0	800
WPM2125-800	WPM4125-800	25.4	800
WPM2138-800	WPM4138-800	38.1	800
WPM2150-800	WPM4150-800	50.8	800
WPM2110-980	WPM4110-980	10.0	980
WPM2112-980	WPM4112-980	12.7	980
WPM2120-980	WPM4120-980	20.0	980
WPM2125-980	WPM4125-980	25.4	980
WPM2138-980	WPM4138-980	38.1	980
WPM2150-980	WPM4150-980	50.8	980
WPM2110-1030	WPM4110-1030	10.0	1030
WPM2112-1030	WPM4112-1030	12.7	1030
WPM2120-1030	WPM4120-1030	20.0	1030
WPM2125-1030	WPM4125-1030	25.4	1030
WPM2138-1030	WPM4138-1030	38.1	1030
WPM2150-1030	WPM4150-1030	50.8	1030
WPM2110-1064	WPM4110-1064	10.0	1064
WPM2112-1064	WPM4112-1064	12.7	1064
WPM2120-1064	WPM4120-1064	20.0	1064
WPM2125-1064	WPM4125-1064	25.4	1064
WPM2138-1064	WPM4138-1064	38.1	1064
WPM2150-1064	WPM4150-1064	50.8	1064
WPM2110-1550	WPM4110-1550	10.0	1550
WPM2112-1550	WPM4112-1550	12.7	1550
WPM2120-1550	WPM4120-1550	20.0	1550
WPM2125-1550	WPM4125-1550	25.4	1550
WPM2138-1550	WPM4138-1550	38.1	1550
WPM2150-1550	WPM4150-1550	50.8	1550

Order Information

WPM2112-355 — M25.4 — Part No.-Mount Diameter

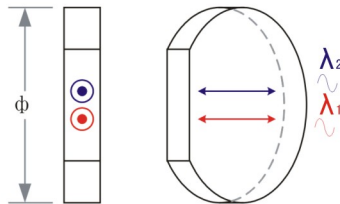
Dual Wavelength Waveplate

This waveplate is a special kind of multi order waveplate. Dual wavelength waveplate is designed to be used in dual wavelength setups, for example, it can be operated as a quarter waveplate @1064nm and as a half waveplate @532nm at the same time. It's always used to manage the states of polarization of laser beams to obtain maximum conversion efficiency.

- High damage threshold
- Thickness: <2.0mm
- RoHS Compliant

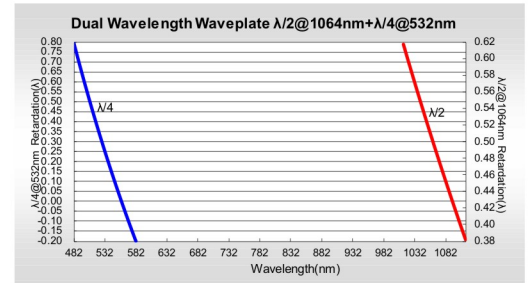
Specifications

Material	Crystal Quartz
Dimension Tolerance	+0/-0.2mm
Surface Quality	20/10 scratch and dig
Clear Aperture	>90%
Wavefront Distortion	<λ/8@632.8nm
Parallelism	<1 arc second
Retardation Tolerance	<λ/100
AR Coating	R<0.5%@two wavelengths
Damage Threshold	>5J/cm², 20ns, 20Hz @1064nm



Standard Product-Dual Wavelength Waveplate

Part No.	Retardation	Diameter(mm)
WPD0112-1521	λ/2@1064nm+λ@532nm	12.7
WPD0120-1521	λ/2@1064nm+λ@532nm	20.0
WPD0125-1521	λ/2@1064nm+λ@532nm	25.4
WPD0112-1512	λ@1064nm+λ/2@532nm	12.7
WPD0120-1512	λ@1064nm+λ/2@532nm	20.0
WPD0125-1512	λ@1064nm+λ/2@532nm	25.4
WPD0112-1524	λ/2@1064nm+λ/4@532nm	12.7
WPD0120-1524	λ/2@1064nm+λ/4@532nm	20.0
WPD0125-1524	λ/2@1064nm+λ/4@532nm	25.4
WPD0112-1542	λ/4@1064nm+λ/2@532nm	12.7
WPD0120-1542	λ/4@1064nm+λ/2@532nm	20.0
WPD0125-1542	λ/4@1064nm+λ/2@532nm	25.4
WPD0112-1541	λ/4@1064nm+λ@532nm	12.7
WPD0120-1541	λ/4@1064nm+λ@532nm	20.0
WPD0125-1541	λ/4@1064nm+λ@532nm	25.4



Order Information

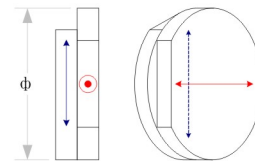
WPD0112-1521 — M25.4

Part No.-Mount Diameter

Middle Infrared Zero Order Waveplate

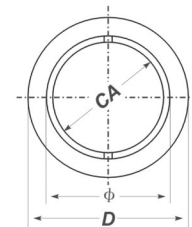
Middle Infrared zero order waveplate is constructed by two Magnesium Fluoride (MgF₂) plates with their fast axis crossed, the two plates are constructed by optically contacted method, the optical path is epoxy free. The difference in thickness between the two plates determines the retardance. Middle Infrared zero order waveplates is widely used in infrared applications, ideally for 2.5-6.0 micron range.

- Ideal for Applications in the 2.5-6.0μm Range
- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- Both Sides AR Coated
- RoHS Compliant



Ring Mount for Waveplate

- Material: Black Anodized Aluminum
- Outer Diameter(D) Tolerance: ± 0.2mm
- Thickness Tolerance: ± 0.2mm
- Clear Aperture Tolerance(Φ): ± 0.2mm
- Custom size available

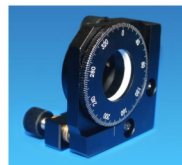


Standard Product-Ring Mount for Waveplate

Part No.	Mount Diameter D(mm)	Waveplate Diameter Φ(mm)	CA(mm)	Thickness(mm)
MSW9001	12.7	10.0	8.0	6.0
MSW9010	25.4	10.0	8.0	6.0
MSW9012	25.4	12.7	11.5	6.0
MSW9015	25.4	15.0	13.5	6.0
MSW9020	25.4	20.0	18.0	6.0
MSW9025	30.0	25.4	22.9	6.0

Rotator Mount for Waveplate

- Material: Black Anodized Aluminum
- Adjustment range: θ_x: ±360° θ_y: ±5° θ_z: ±5°
- Minimum reading: 2°



Standard Product-Rotator Mount for Waveplate

Part No.	Dimension(mm)	Optical Height (mm)	Optic Size (mm)	CA(mm)
OMPO12.7-1	58.0*58.0*41.0	35.0	Φ25.4*6.0	11.0
OMPO25.4-1	58.0*58.0*41.0	35.0	Φ25.4*6.0	23.0
OMPO30-1	66.0*66.0*41.0	39.0	Φ30.0*6.0	27.0