

Company Overview



TwinStar is a custom manufacturer of high quality laser optics and crystals specializing in high damage, Ion assisted e-beam deposition thin film coatings for the UV-VIS-NIR.

TwinStar offers a broad line of optical products including etalons, waveplates, laser mirror substrates, prisms, windows, etc. Our crystal department specializes in the fabrication and polishing of all laser crystals including Nd:YAG, YLF, and Ruby and our coating department delivers the high-damage laser line anti-reflection and reflection coatings on any of our substrates or crystals.

We welcome the opportunity to discuss and work with the Laser and Telecommunications Industries on challenging projects and OEM requirements with regard to timely deliveries and reasonable pricing.

Purchasing Information

Purchase Orders are accepted via telephone, mail, facsimile or email.

Visa & Mastercard are welcome for your convenience.

Quotations written or verbal are valid for 30 days from the date of the quotation.

Discounts are offered for volume purchases. Please contact our sales department for further information.

Terms of Payment for all invoices are net 30 days, upon credit approval and establishment of an open account.

Shipping is F.O.B. Port Richey, Florida, U.S.A. All shipping charges will be prepaid and added to the invoice unless otherwise specified.

Warranty period is for sixty days from the date of shipment. TwinStar guarantees that all products will meet agreed upon specifications. Should a discrepancy occur, a return material authorization number (RMA#) must be obtained prior to return of the product. This warranty extends to the purchase value only, and material found defective will be repaired or replaced at no charge. Customer furnished material for fabrication and/or coating is warranted for the value of the work performed only. There is no liability assumed for the value of the material furnished.

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Optical Component Codes



Optics

Birefringent Filters Plates	BP
Birefringent Filters Units	BU
Brewster Angle Windows	BA
Crystal Quartz Windows	WQ
Depolarizers.	D
Etalons (Fixed Air Space)	EA
Etalons (Solid)	E
Flat and Parallel Windows	FP
Flat Mirror Substrates (5' and 30' Wedge)	FM
Flat Mirror Substrates (1° and 2° Wedge)	FM
General Purpose Windows (Round)	WR
General Purpose Windows (Square)	WS
Interferometer Flats	F
Laser Mirror Substrates (Plano/Concave)	MC
Laser Mirror Substrates (Plano/Convex)	MX
Polarization Rotators (45° and 90°).	PF, PN
Prism (Littrow)	P
Prism (Right Angle)	RP
Unstable Resonator Output Couplers	UR
Waveplates Combination	WCQ,WCH
Waveplates Harmonic.	WHQ,WHH
Waveplates Multiple Order.	WMQ,WMH
Waveplates Zero Order.	WZQ,WZH

Laser Crystal Polishing

Nd:YAG	Y
Nd:YLF, Er:YLF, Ho:YLF, Co:MgF2	NY
Nd:Glass	N
Ruby	R

Catalog Key Codes



Optics

Diameter		Thickness		Radius of Curvature		Diameter x Thk.	
5mm	19	.05mm	002	2.5cm	02	7.5mm x 4mm	0
6mm	24	.10mm	004	5.0cm	05	0.500" x .125"	1
6.5mm	26	.15mm	006	7.5cm	07	0.500" x .250"	2
7.75mm	27	.20mm	008	10cm	10	0.500" x .375"	3
8mm	31	.25mm	010	12.5cm	12	15mm x 10mm	4
9mm	35	.30mm	012	15cm	15	0.750" x .250"	5
.375"	37	.50mm	020	20cm	20	0.750" x .375"	6
10mm	39	.75mm	030	25cm	25	1.000" x .250"	7
.500"	50	1.0mm	039	30cm	30	1.000" x .375"	8
13mm	51	1.5mm	059	40cm	40	1.500" x .375"	9
15mm	59	2.0mm	079	50cm	50		
16mm	63	2.5mm	098	60cm	60		
.750"	75	3.0mm	118	70cm	70		
20mm	78	4.0mm	157	75cm	75		
1.00"	10	5.0mm	197	80cm	80		
30mm	11	7.5mm	295	90cm	90		
1.25"	12	9.5mm	036	Meter	1M		
35mm	14	10mm	394	2 Meter	2M		
1.50"	15	15mm	591	3 Meter	3M		
50mm	19	.062"	062	4 Meter	4M		
2.00"	20	.125"	125	5 Meter	5M		
3.00"	30	.250"	250	7 Meter	7M		
4.00"	40	.375"	375	8 Meter	8M		
5.00"	50	.500"	500	10 Meter	9M		
25mm	98						

Crystals

Diameter		Length	
1.00mm	01	00.5mm	005
1.50mm	06	05.0mm	050
2.00mm	02	10.0mm	100
2.50mm	09	20.0mm	200
3.00mm	03	30.0mm	300
4.00mm	04	50.0mm	500
5.00mm	05	63.0mm	630
6.35mm	25	79.0mm	790
7.00mm	26	101.6mm	102
8.50mm	33	127.0mm	127
9.00mm	35	152.4mm	152
9.52mm	37		
10.00mm	39		
12.70mm	50		
19.00mm	75		

Building Part Numbers (Coated Components)



Example:

Optics

To order a 1" dia. X 1/4" thick, 1 meter concave spherical laser mirror with an 80% reflection at 1064nm.

Refer to the spherical laser mirror section Pages 31-32. This part number is MC7-1M

Coatings

Refer to Nd:YAG (1064nm), page 47, for 80% reflection at 1064nm the part number is 12004. Therefore the complete part number would be MC7-1M-12004

If you have any questions about building a part number or have a custom part that you would like us to quote on, please contact one of our sales engineers for assistance.

To identify a part number please refer to the codes on pages iii & iv.

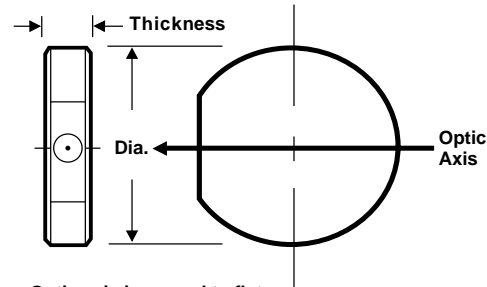
Multiple Order Waveplates (1/4, 1/2)



Diameter (mm)

Specifications:

Material..... Crystal quartz
 Parallelism..... Less than 0.5 arc seconds
 Surface Quality..... 10/5
 Retardation Tolerance..... 1/600
 Transmitted Wavefront..... 1/10
 Diameter Tolerance..... +.000", -.005"
 Clear Aperture..... Central 90% of diameter



Optic axis is normal to flat
 on plate (plate approximately 1 mm thick)

Wavelength (nm)	Diameter (mm)			
	10 mm	15 mm	20 mm	30 mm
248.0 1/4	WMQ248-39	WMQ248-59	WMQ248-78	WMQ248-11
248.0 1/2	WMH248-39	WMH248-59	WMH248-78	WMH248-11
266.0 1/4	WMQ266-39	WMQ266-59	WMQ266-78	WMQ266-11
266.0 1/2	WMH266-39	WMH266-59	WMH266-78	WMH266-11
308.0 1/4	WMQ308-39	WMQ308-59	WMQ308-78	WMQ308-11
308.0 1/2	WMH308-39	WMH308-59	WMH308-78	WMH308-11
354.7 1/4	WMQ354-39	WMQ354-59	WMQ354-78	WMQ354-11
354.7 1/2	WMH354-39	WMH354-59	WMH354-78	WMH354-11
441.6 1/4	WMQ441-39	WMQ441-59	WMQ441-78	WMQ441-11
441.6 1/2	WMH441-39	WMH441-59	WMH441-78	WMH441-11
488.0 1/4	WMQ488-39	WMQ488-59	WMQ488-78	WMQ488-11
488.0 1/2	WMH488-39	WMH488-59	WMH488-78	WMH488-11
514.5 1/4	WMQ514-39	WMQ514-59	WMQ514-78	WMQ514-11
514.5 1/2	WMH514-39	WMH514-59	WMH514-78	WMH514-11
532.0 1/4	WMQ532-39	WMQ532-59	WMQ532-78	WMQ532-11
532.0 1/2	WMH532-39	WMH532-59	WMH532-78	WMH532-11
632.8 1/4	WMQ632-39	WMQ632-59	WMQ632-78	WMQ632-11
632.8 1/2	WMH632-39	WMH632-59	WMH632-78	WMH632-11
694.3 1/4	WMQ694-39	WMQ694-59	WMQ694-78	WMQ694-11
694.3 1/2	WMH694-39	WMH694-59	WMH694-78	WMH694-11

*For anti-reflection coatings, add AR to the end of the part number.

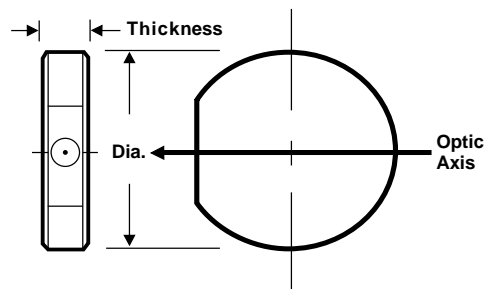
Multiple Order Waveplates (1/4, 1/2)



Diameter (Inches)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/600
 Transmitted Wavefront 1/10
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Optic axis is normal to flat
 on plate (plate approximately 1 mm thick)

Wavelength (nm)	Diameter (Inches)			
	.500"	.750"	1.00"	1.50"
248.0 1/4	WMQ248-50	WMQ248-75	WMQ248-10	WMQ248-15
248.0 1/2	WMH248-50	WMH248-75	WMH248-10	WMH248-15
266.0 1/4	WMQ266-50	WMQ266-75	WMQ266-10	WMQ266-15
266.0 1/2	WMH266-50	WMH266-75	WMH266-10	WMH266-15
308.0 1/4	WMQ308-50	WMQ308-75	WMQ308-10	WMQ308-15
308.0 1/2	WMH308-50	WMH308-75	WMH308-10	WMH308-15
354.7 1/4	WMQ354-50	WMQ354-75	WMQ354-10	WMQ354-15
354.7 1/2	WMH354-50	WMH354-75	WMH354-10	WMH354-15
441.6 1/4	WMQ441-50	WMQ441-75	WMQ441-10	WMQ441-15
441.6 1/2	WMH441-50	WMH441-75	WMH441-10	WMH441-15
488.0 1/4	WMQ488-50	WMQ488-75	WMQ488-10	WMQ488-15
488.0 1/2	WMH488-50	WMH488-75	WMH488-10	WMH488-15
514.5 1/4	WMQ514-50	WMQ514-75	WMQ514-10	WMQ514-15
514.5 1/2	WMH514-50	WMH514-75	WMH514-10	WMH514-15
532.0 1/4	WMQ532-50	WMQ532-75	WMQ532-10	WMQ532-15
532.0 1/2	WMH532-50	WMH532-75	WMH532-10	WMH532-15
632.8 1/4	WMQ632-50	WMQ632-75	WMQ632-10	WMQ632-15
632.8 1/2	WMH632-50	WMH632-75	WMH632-10	WMH632-15
694.3 1/4	WMQ694-50	WMQ694-75	WMQ694-10	WMQ694-15
694.3 1/2	WMH694-50	WMH694-75	WMH694-10	WMH694-15

*For anti-reflection coatings, add AR to the end of the part number.

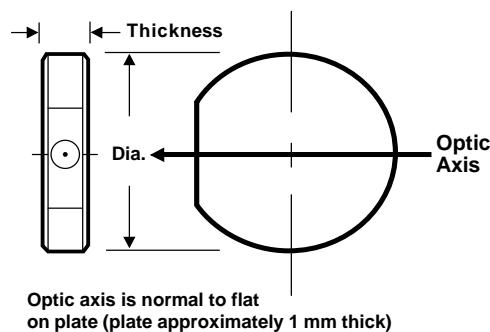
Multiple Order Waveplates (1/4, 1/2)



Diameter (mm)

Specifications:

Material..... Crystal quartz
 Parallelism..... Less than 0.5 arc seconds
 Surface Quality..... 10/5
 Retardation Tolerance..... 1/600
 Transmitted Wavefront..... 1/10
 Diameter Tolerance..... +.000", -.005"
 Clear Aperture..... Central 90% of diameter



Diameter (mm)				
Wavelength (nm)	10mm	15mm	20mm	30mm
790.0 1/4	WMQ790-39	WMQ790-59	WMQ790-78	WMQ790-11
790.0 1/2	WMH790-39	WMH790-59	WMH790-78	WMH790-11
800.0 1/4	WMQ800-39	WMQ800-59	WMQ800-78	WMQ800-11
800.0 1/2	WMH800-39	WMH800-59	WMH800-78	WMH800-11
810.0 1/4	WMQ810-39	WMQ810-59	WMQ810-78	WMQ810-11
810.0 1/2	WMH810-39	WMH810-59	WMH810-78	WMH810-11
830.0 1/4	WMQ830-39	WMQ830-59	WMQ830-78	WMQ830-11
830.0 1/2	WMH830-39	WMH830-59	WMH830-78	WMH830-11
1053.0 1/4	WMQ104-39	WMQ104-59	WMQ104-78	WMQ104-11
1053.0 1/2	WMH104-39	WMH104-59	WMH104-78	WMH104-11
1054.0 1/4	WMQ105-39	WMQ105-59	WMQ105-78	WMQ105-11
1054.0 1/2	WMH105-39	WMH105-59	WMH105-78	WMH105-11
1064.1 1/4	WMQ106-39	WMQ106-59	WMQ106-78	WMQ106-11
1064.1 1/2	WMH106-39	WMH106-59	WMH106-78	WMH106-11
1319.0 1/4	WMQ132-39	WMQ132-59	WMQ132-78	WMQ132-11
1319.0 1/2	WMH132-39	WMH132-59	WMH132-78	WMH132-11
1550.0 1/4	WMQ155-39	WMQ155-59	WMQ155-78	WMQ155-11
1550.0 1/2	WMH155-39	WMH155-59	WMH155-78	WMH155-11
2100.0 1/4	WMQ210-39	WMQ210-59	WMQ210-78	WMQ210-11
2100.0 1/2	WMH210-39	WMH210-59	WMH210-78	WMH210-11

*For anti-reflection coatings, add AR to the end of the part number.

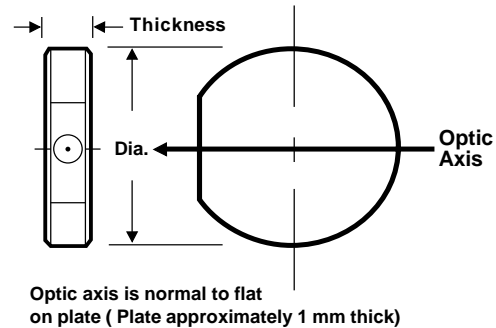
Multiple Order Waveplates (1/4, 1/2)



Diameter (Inches)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/600
 Transmitted Wavefront 1/10
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Diameter (Inches)				
Wavelength (nm)	.500"	.750"	1.00"	1.50"
790.0 1/4	WMQ790-50	WMQ790-75	WMQ790-10	WMQ790-15
790.0 1/2	WMH790-50	WMH790-75	WMH790-10	WMH790-15
800.0 1/4	WMQ800-50	WMQ800-75	WMQ800-10	WMQ800-15
800.0 1/2	WMH800-50	WMH800-75	WMH800-10	WMH800-15
810.0 1/4	WMQ810-50	WMQ810-75	WMQ810-10	WMQ810-15
810.0 1/2	WMH810-50	WMH810-75	WMH810-10	WMH810-15
830.0 1/4	WMQ830-50	WMQ830-75	WMQ830-10	WMQ830-15
830.0 1/2	WMH830-50	WMH830-75	WMH830-10	WMH830-15
1053.0 1/4	WMQ104-50	WMQ104-75	WMQ104-10	WMQ104-15
1053.0 1/2	WMH104-50	WMH104-75	WMH104-10	WMH104-15
1054.0 1/4	WMQ105-50	WMQ105-75	WMQ105-10	WMQ105-15
1054.0 1/2	WMH105-50	WMH105-75	WMH105-10	WMH105-15
1064.1 1/4	WMQ106-50	WMQ106-75	WMQ106-10	WMQ106-15
1064.1 1/2	WMH106-50	WMH106-75	WMH106-10	WMH106-15
1319.0 1/4	WMQ132-50	WMQ132-75	WMQ132-10	WMQ132-15
1319.0 1/2	WMH132-50	WMH132-75	WMH132-10	WMH132-15
1550.0 1/4	WMQ155-50	WMQ155-75	WMQ155-10	WMQ155-15
1550.0 1/2	WMH155-50	WMH155-75	WMH155-10	WMH155-15
2100.0 1/4	WMQ210-50	WMQ210-75	WMQ210-10	WMQ210-15
2100.0 1/2	WMH210-50	WMH210-75	WMH210-10	WMH210-15

*For anti-reflection coatings, add AR to the end of the part number.

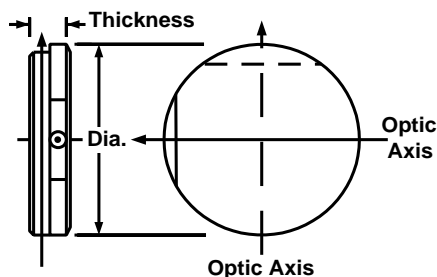
Zero Order Waveplates (1/4, 1/2)



Diameter (mm)

Specifications:

Material..... Crystal quartz
 Parallelism..... Less than 0.5 arc seconds
 Surface Quality..... 10/5
 Retardation Tolerance..... 1/600
 Transmitted Wavefront..... 1/4
 Diameter Tolerance..... +.000", -.005"
 Clear Aperture..... Central 90% of diameter



Optic axis is normal to polished flat on plates
 (two plates optically contacted, app. 2 mm thick)

Wavelength (nm)	Diameter (mm)			
	10 mm	15 mm	20 mm	30 mm
248.0 1/4	WZQ248-39	WZQ248-59	WZQ248-78	WZQ248-11
248.0 1/2	WZH248-39	WZH248-59	WZH248-78	WZH248-11
266.0 1/4	WZQ266-39	WZQ266-59	WZQ266-78	WZQ266-11
266.0 1/2	WZH266-39	WZH266-59	WZH266-78	WZH266-11
308.0 1/4	WZQ308-39	WZQ308-59	WZQ308-78	WZQ308-11
308.0 1/2	WZH308-39	WZH308-59	WZH308-78	WZH308-11
354.7 1/4	WZQ354-39	WZQ354-59	WZQ354-78	WZQ354-11
354.7 1/2	WZH354-39	WZH354-59	WZH354-78	WZH354-11
441.6 1/4	WZQ441-39	WZQ441-59	WZQ441-78	WZQ441-11
441.6 1/2	WZH441-39	WZH441-59	WZH441-78	WZH441-11
488.0 1/4	WZQ488-39	WZQ488-59	WZQ488-78	WZQ488-11
488.0 1/2	WZH488-39	WZH488-59	WZH488-78	WZH488-11
514.5 1/4	WZQ514-39	WZQ514-59	WZQ514-78	WZQ514-11
514.5 1/2	WZH514-39	WZH514-59	WZH514-78	WZH514-11
532.0 1/4	WZQ532-39	WZQ532-59	WZQ532-78	WZQ532-11
532.0 1/2	WZH532-39	WZH532-59	WZH532-78	WZH532-11
632.8 1/4	WZQ632-39	WZQ632-59	WZQ632-78	WZQ632-11
632.8 1/2	WZH632-39	WZH632-59	WZH632-78	WZH632-11
694.3 1/4	WZQ694-39	WZQ694-59	WZQ694-78	WZQ694-11
694.3 1/2	WZH694-39	WZH694-59	WZH694-78	WZH694-11

*For anti-reflection coatings, add AR to the end of the part number.

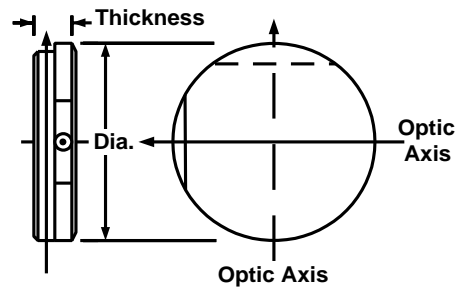
Zero Order Waveplates (1/4, 1/2)



Diameter (Inches)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/600
 Transmitted Wavefront 1/4
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Optic axis is normal to polished flat on plates
 (two plates optically contacted, app. 2 mm thick)

Wavelength (nm)	Diameter (Inches)			
	.500"	.750"	1.00"	1.50"
248.0 1/4	WZQ248-50	WZQ248-75	WZQ248-10	WZQ248-15
248.0 1/2	WZH248-50	WZH248-75	WZH248-10	WZH248-15
266.0 1/4	WZQ266-50	WZQ266-75	WZQ266-10	WZQ266-15
266.0 1/2	WZH266-50	WZH266-75	WZH266-10	WZH266-15
308.0 1/4	WZQ308-50	WZQ308-75	WZQ308-10	WZQ308-15
308.0 1/2	WZH308-50	WZH308-75	WZH308-10	WZH308-15
354.7 1/4	WZQ354-50	WZQ354-75	WZQ354-10	WZQ354-15
354.7 1/2	WZH354-50	WZH354-75	WZH354-10	WZH354-15
441.6 1/4	WZQ441-50	WZQ441-75	WZQ441-10	WZQ441-15
441.6 1/2	WZH441-50	WZH441-75	WZH441-10	WZH441-15
488.0 1/4	WZQ488-50	WZQ488-75	WZQ488-10	WZQ488-15
488.0 1/2	WZH488-50	WZH488-75	WZH488-10	WZH488-15
514.5 1/4	WZQ514-50	WZQ514-75	WZQ514-10	WZQ514-15
514.5 1/2	WZH514-50	WZH514-75	WZH514-10	WZH514-15
532.0 1/4	WZQ532-50	WZQ532-75	WZQ532-10	WZQ532-15
532.0 1/2	WZH532-50	WZH532-75	WZH532-10	WZH532-15
632.8 1/4	WZQ632-50	WZQ632-75	WZQ632-10	WZQ632-15
632.8 1/2	WZH632-50	WZH632-75	WZH632-10	WZH632-15
694.3 1/4	WZQ694-50	WZQ694-75	WZQ694-10	WZQ694-15
694.3 1/2	WZH694-50	WZH694-75	WZH694-10	WZH694-15

*For anti-reflection coatings, add AR to the end of the part number.

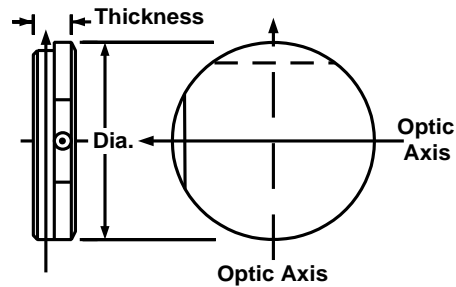
Zero Order Waveplates (1/4, 1/2)



Diameter (mm)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/600
 Transmitted Wavefront 1/4
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Optic axis is normal to polished flat on plates
 (two plates optically contacted, app. 2 mm thick)

Wavelength (nm)	Diameter (mm)			
	10 mm	15 mm	20 mm	30 mm
790.0 1/4	WZQ790-39	WZQ790-59	WZQ790-78	WZQ790-11
790.0 1/2	WZH790-39	WZH790-59	WZH790-78	WZH790-11
800.0 1/4	WZQ800-39	WZQ800-59	WZQ800-78	WZQ800-11
800.0 1/2	WZH800-39	WZH800-59	WZH800-78	WZH800-11
810.0 1/4	WZQ810-39	WZQ810-59	WZQ810-78	WZQ810-11
810.0 1/2	WZH810-39	WZH810-59	WZH810-78	WZH810-11
830.0 1/4	WZQ830-39	WZQ830-59	WZQ830-78	WZQ830-11
830.0 1/2	WZH830-39	WZH830-59	WZH830-78	WZH830-11
1053.0 1/4	WZQ104-39	WZQ104-59	WZQ104-78	WZQ104-11
1053.0 1/2	WZH104-39	WZH104-59	WZH104-78	WZH104-11
1054.0 1/4	WZQ105-39	WZQ105-59	WZQ105-78	WZQ105-11
1054.0 1/2	WZH105-39	WZH105-59	WZH105-78	WZH105-11
1064.1 1/4	WZQ106-39	WZQ106-59	WZQ106-78	WZQ106-11
1064.1 1/2	WZH106-39	WZH106-59	WZH106-78	WZH106-11
1319.0 1/4	WZQ132-39	WZQ132-59	WZQ132-78	WZQ132-11
1319.0 1/2	WZH132-39	WZH132-59	WZH132-78	WZH132-11
1550.0 1/4	WZQ155-39	WZQ155-59	WZQ155-78	WZQ155-11
1550.0 1/2	WZH155-39	WZH155-59	WZH155-78	WZH155-11
2100.0 1/4	WZQ210-39	WZQ210-59	WZQ210-78	WZQ210-11
2100.0 1/2	WZH210-39	WZH210-59	WZH210-78	WZH210-11

*For anti-reflection coatings, add AR to the end of the part number.

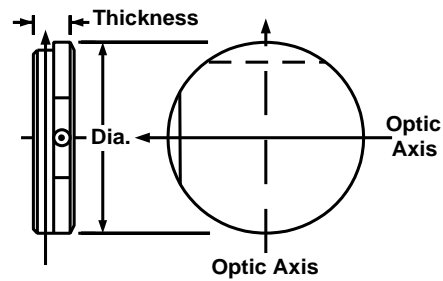
Zero Order Waveplates (1/4, 1/2)



Diameter (Inches)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/600
 Transmitted Wavefront 1/4
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Optic axis is normal to polished flat on plates
 (two plates optically contacted, app. 2 mm thick)

Wavelength (nm)	Diameter (Inches)			
	.500"	.750"	1.00"	1.50"
790.0 1/4	WZQ790-50	WZQ790-75	WZQ790-10	WZQ790-15
790.0 1/2	WZH790-50	WZH790-75	WZH790-10	WZH790-15
800.0 1/4	WZQ800-50	WZQ800-75	WZQ800-10	WZQ800-15
800.0 1/2	WZH800-50	WZH800-75	WZH800-10	WZH800-15
810.0 1/4	WZQ810-50	WZQ810-75	WZQ810-10	WZQ810-15
810.0 1/2	WZH810-50	WZH810-75	WZH810-10	WZH810-15
830.0 1/4	WZQ830-50	WZQ830-75	WZQ830-10	WZQ830-15
830.0 1/2	WZH830-50	WZH830-75	WZH830-10	WZH830-15
1053.0 1/4	WZQ104-50	WZQ104-75	WZQ104-10	WZQ104-15
1053.0 1/2	WZH104-50	WZH104-75	WZH104-10	WZH104-15
1054.0 1/4	WZQ105-50	WZQ105-75	WZQ105-10	WZQ105-15
1054.0 1/2	WZH105-50	WZH105-75	WZH105-10	WZH105-15
1064.1 1/4	WZQ106-50	WZQ106-75	WZQ106-10	WZQ106-15
1064.1 1/2	WZH106-50	WZH106-75	WZH106-10	WZH106-15
1319.0 1/4	WZQ132-50	WZQ132-75	WZQ132-10	WZQ132-15
1319.0 1/2	WZH132-50	WZH132-75	WZH132-10	WZH132-15
1550.0 1/4	WZQ155-50	WZQ155-75	WZQ155-10	WZQ155-15
1550.0 1/2	WZH155-50	WZH155-75	WZH155-10	WZH155-15
2100.0 1/4	WZQ210-50	WZQ210-75	WZQ210-10	WZQ210-15
2100.0 1/2	WZH210-50	WZH210-75	WZH210-10	WZH210-15

*For anti-reflection coatings, add AR to the end of the part number.

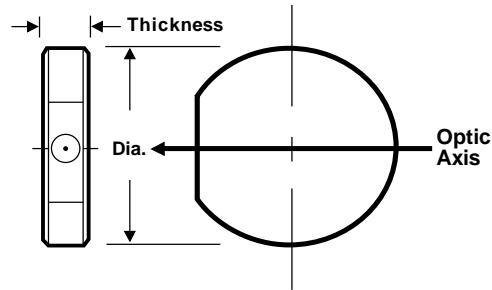
Dual Wavelength Waveplates



Diameter (mm)

Specifications:

Material	Crystal quartz
Parallelism	Less than 0.5 arc seconds
Surface Quality	10/5
Retardation Tolerance	1/300
Transmitted Wavefront	1/10
Diameter Tolerance	+ .000", - .005"
Clear Aperture	Central 90% of diameter



Optic axis is normal to flat on plate
(plate app. 1 mm thick)

Diameter (mm)				
Wavelength (nm)	10 mm	15 mm	20 mm	30 mm
1/4 488.0 & 1/4 514.5	WCQ488/515-39	WCQ488/515-59	WCQ488/515-78	WCQ488/515-11
1/2 488.0 & 1/2 514.5	WCH488/515-39	WCH488/515-59	WCH488/515-78	WCH488/515-11
1/4 632.8 & 1/4 351.1	WCQ632/351-39	WCQ632/351-59	WCQ632/351-78	WCQ632/351-11
1/2 632.8 & 1/2 351.1	WCH632/351-39	WCH632/351-59	WCH632/351-78	WCH632/351-11
1/4 632.8 & 1/4 441.6	WCQ632/441-39	WCQ632/441-59	WCQ632/441-78	WCQ632/441-11
1/2 632.8 & 1/2 441.6	WCH632/441-39	WCH632/441-59	WCH632/441-78	WCH632/441-11
1/4 632.8 & 1/4 488.0	WCQ632/488-39	WCQ632/488-59	WCQ632/488-78	WCQ632/488-11
1/2 632.8 & 1/2 488.0	WCH632/488-39	WCH632/488-59	WCH632/488-78	WCH632/488-11
1/4 632.8 & 1/4 514.5	WCQ632/514-39	WCQ632/514-59	WCQ632/514-78	WCQ632/514-11
1/2 632.8 & 1/2 514.5	WCH632/514-39	WCH632/514-59	WCH632/514-78	WCH632/514-11
1/4 632.8 & 1/4 647.1	WCQ632/647-39	WCQ632/647-59	WCQ632/647-78	WCQ632/647-11
1/2 632.8 & 1/2 647.1	WCH632/647-39	WCH632/647-59	WCH632/647-78	WCH632/647-11
1/4 632.8 & 1/4 830.0	WCQ632/830-39	WCQ632/830-59	WCQ632/830-78	WCQ632/830-11
1/2 632.8 & 1/2 830.0	WCH632/830-39	WCH632/830-59	WCH632/830-78	WCH632/830-11
1/4 632.8 & 1/4 850.0	WCQ632/850-39	WCQ632/850-59	WCQ632/850-78	WCQ632/850-11
1/2 632.8 & 1/2 850.0	WCH632/850-39	WCH632/850-59	WCH632/850-78	WCH632/850-11
1/4 632.8 & 1/4 1064.1	WCQ632/106-39	WCQ632/106-59	WCQ632/106-78	WCQ632/106-11
1/2 632.8 & 1/2 1064.1	WCH632/106-39	WCH632/106-59	WCH632/106-78	WCH632/106-11

*For anti-reflection coatings, add AR to the end of the part number.

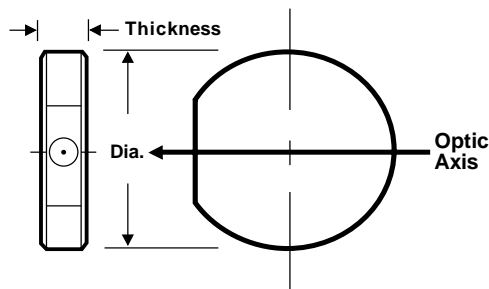
Dual Wavelength Waveplates



Diameter (Inches)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/300
 Transmitted Wavefront 1/10
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Optic axis is normal to flat on plate
 (plate app. 1 mm thick)

Wavelength (nm)	Diameter Inches			
	.500"	.750"	1.00"	1.50"
1/4 488.0 & 1/4 514.5	WCQ488/515-50	WCQ488/515-75	WCQ488/515-10	WCQ488/515-15
1/2 488.0 & 1/2 514.5	WCH488/515-50	WCH488/515-75	WCH488/515-10	WCH488/515-15
1/4 632.8 & 1/4 351.1	WCQ632/351-50	WCQ632/351-75	WCQ632/351-10	WCQ632/351-15
1/2 632.8 & 1/2 351.1	WCH632/351-50	WCH632/351-75	WCH632/351-10	WCH632/351-15
1/4 632.8 & 1/4 441.6	WCQ632/441-50	WCQ632/441-75	WCQ632/441-10	WCQ632/441-15
1/2 632.8 & 1/2 441.6	WCH632/441-50	WCH632/441-75	WCH632/441-10	WCH632/441-15
1/4 632.8 & 1/4 488.0	WCQ632/488-50	WCQ632/488-75	WCQ632/488-10	WCQ632/488-15
1/2 632.8 & 1/2 488.0	WCH632/488-50	WCH632/488-75	WCH632/488-10	WCH632/488-15
1/4 632.8 & 1/4 514.5	WCQ632/514-50	WCQ632/514-75	WCQ632/514-10	WCQ632/514-15
1/2 632.8 & 1/2 514.5	WCH632/514-50	WCH632/514-75	WCH632/514-10	WCH632/514-15
1/4 632.8 & 1/4 647.1	WCQ632/647-50	WCQ632/647-75	WCQ632/647-10	WCQ632/647-15
1/2 632.8 & 1/2 647.1	WCH632/647-50	WCH632/647-75	WCH632/647-10	WCH632/647-15
1/4 632.8 & 1/4 830.0	WCQ632/830-50	WCQ632/830-75	WCQ632/830-10	WCQ632/830-15
1/2 632.8 & 1/2 830.0	WCH632/830-50	WCH632/830-75	WCH632/830-10	WCH632/830-15
1/4 632.8 & 1/4 850.0	WCQ632/850-50	WCQ632/850-75	WCQ632/850-10	WCQ632/850-15
1/2 632.8 & 1/2 850.0	WCH632/850-50	WCH632/850-75	WCH632/850-10	WCH632/850-15
1/4 632.8 & 1/4 1064.1	WCQ632/106-50	WCQ632/106-75	WCQ632/106-10	WCQ632/106-15
1/2 632.8 & 1/2 1064.1	WCH632/106-50	WCH632/106-75	WCH632/106-10	WCH632/106-15

*For anti-reflection coatings, add AR to the end of the part number.

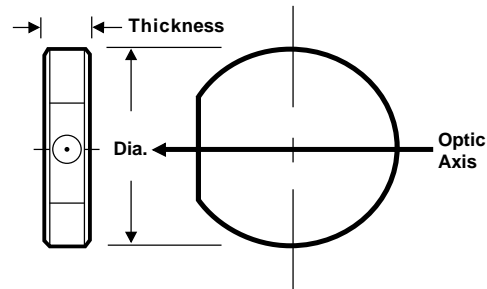
1064.1 nm Harmonic Waveplates



Diameter (mm)

Specifications:

Material..... Crystal quartz
 Parallelism..... Less than 0.5 arc seconds
 Surface Quality..... 10/5
 Retardation Tolerance 1/300
 Transmitted Wavefront 1/10
 Diameter Tolerance +.000", -.005"
 Clear Aperture..... Central 90% of diameter



Optic axis is normal to flat on plate
 (plate app. 1 mm thick)

Wavelength (nm)	Diameter (mm)			
	10 mm	15 mm	20 mm	30 mm
1/1 1064.1 & 1/4 266.0	WHF106/Q266-39	WHF106/Q266-59	WHF106/Q266-78	WHF106/Q266-11
1/1 1064.1 & 1/2 266.0	WHF106/H266-39	WHF106/H266-59	WHF106/H266-78	WHF106/H266-11
1/1 1064.1 & 1/4 532.0	WHF106/Q532-39	WHF106/Q532-59	WHF106/Q532-78	WHF106/Q532-11
1/1 1064.1 & 1/2 532.0	WHF106/H532-39	WHF106/H532-59	WHF106/H532-78	WHF106/H532-11
1/1 532.0 & 1/4 266.0	WHF532/Q266-39	WHF532/Q266-59	WHF532/Q266-78	WHF532/Q266-11
1/1 532.0 & 1/2 266.0	WHF532/H266-39	WHF532/H266-59	WHF532/H266-78	WHF532/H266-11
1/1 532.0 & 1/4 354.7	WHF532/Q354-39	WHF532/Q354-59	WHF532/Q354-78	WHF532/Q354-11
1/1 532.0 & 1/2 354.7	WHF532/H354-39	WHF532/H354-59	WHF532/H354-78	WHF532/H354-11
1/1 532.0 & 1/4 1064.1	WHF532/Q106-39	WHF532/Q106-59	WHF532/Q106-78	WHF532/Q106-11
1/1 532.0 & 1/2 1064.1	WHF532/H106-39	WHF532/H106-59	WHF532/H106-78	WHF532/H106-11
1/1 354.7 & 1/4 266.0	WHF354/Q266-39	WHF354/Q266-59	WHF354/Q266-78	WHF354/Q266-11
1/1 354.7 & 1/2 266.0	WHF354/H266-39	WHF354/H266-59	WHF354/H266-78	WHF354/H266-11
1/1 354.7 & 1/4 532.0	WHF354/Q532-39	WHF354/Q532-59	WHF354/Q532-78	WHF354/Q532-11
1/1 354.7 & 1/2 532.0	WHF354/H532-39	WHF354/H532-59	WHF354/H532-78	WHF354/H532-11
1/1 354.7 & 1/4 1064.1	WHF354/Q106-39	WHF354/Q106-59	WHF354/Q106-78	WHF354/Q106-11
1/1 354.7 & 1/2 1064.1	WHF354/H106-39	WHF354/H106-59	WHF354/H106-78	WHF354/H106-11
1/1 266.0 & 1/4 354.7	WHF266/Q354-39	WHF266/Q354-59	WHF266/Q354-78	WHF266/Q354-11
1/1 266.0 & 1/2 354.7	WHF266/H354-39	WHF266/H354-59	WHF266/H354-78	WHF266/H354-11
1/1 266.0 & 1/4 532.0	WHF266/Q532-39	WHF266/Q532-59	WHF266/Q532-78	WHF266/Q532-11
1/1 266.0 & 1/2 532.0	WHF266/H532-39	WHF266/H532-59	WHF266/H532-78	WHF266/H532-11
1/1 266.0 & 1/4 1064.1	WHF266/Q106-39	WHF266/Q106-59	WHF266/Q106-78	WHF266/Q106-11
1/1 266.0 & 1/2 1064.1	WHF266/H106-39	WHF266/H106-59	WHF266/H106-78	WHF266/H106-11

*For anti-reflection coatings, add AR to the end of the part number.

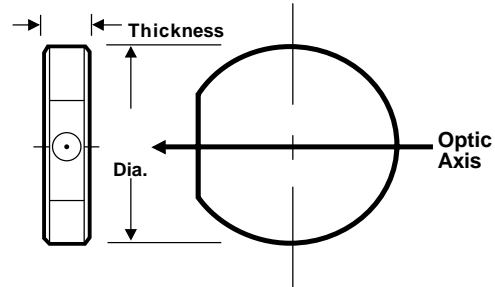
1064.1 nm Harmonic Waveplates



Diameter (mm)

Specifications:

Material..... Crystal quartz
 Parallelism..... Less than 0.5 arc seconds
 Surface Quality..... 10/5
 Retardation Tolerance..... 1/300
 Transmitted Wavefront..... 1/10
 Diameter Tolerance..... +.000", -.005"
 Clear Aperture..... Central 90% of diameter



Optic axis is normal to flat on plate
 (plate app. 1 mm thick)

Diameter (mm)				
Wavelength (nm)	10 mm	15 mm	20 mm	30 mm
1/4 1064.1 & 1/4 532.0	WHQ106/Q532-39	WHQ106/Q532-59	WHQ106/Q532-78	WHQ106/Q532-11
1/2 1064.1 & 1/2 532.0	WHH106/H532-39	WHH106/H532-59	WHH106/H532-78	WHH106/H532-11
3/4 1064.1 & 1/2 532.0	WHT106/H532-39	WHT106/H532-59	WHT106/H532-78	WHT106/H532-11
1/4 354.7 & 1/4 532.0	WHQ354/Q532-39	WHQ354/Q532-59	WHQ354/Q532-78	WHQ354/Q532-11
1/2 354.7 & 1/2 532.0	WHH354/H532-39	WHH354/H532-59	WHH354/H532-78	WHH354/H532-11
1/2 354.7 & 1/4 532.0	WHH354/Q532-39	WHH354/Q532-59	WHH354/Q532-78	WHH354/Q532-11

*For anti-reflection coatings, add AR to the end of the part number.

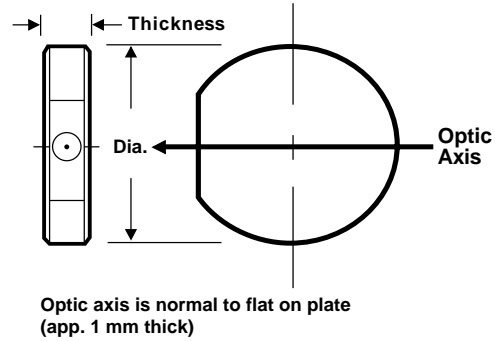
1064.1nm Harmonic Waveplates



Diameter (Inches)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/300
 Transmitted Wavefront 1/10
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Wavelength (nm)	Diameter Inches			
	.500"	.750"	1.00"	1.50"
1/1 1064.1 & 1/4 266.0 1/1 1064.1 & 1/2 266.0	WHF106/Q266-50 WHF106/H266-50	WHF106/Q266-75 WHF106/H266-75	WHF106/Q266-10 WHF106/H266-10	WHF106/Q266-15 WHF106/H266-15
1/1 1064.1 & 1/4 532.0 1/1 1064.1 & 1/2 532.0	WHF106/Q532-50 WHF106/H532-50	WHF106/Q532-75 WHF106/H532-75	WHF106/Q532-10 WHF106/H532-10	WHF106/Q532-15 WHF106/H532-15
1/1 532.0 & 1/4 266.0 1/1 532.0 & 1/2 266.0	WHF532/Q266-50 WHF532/H266-50	WHF532/Q266-75 WHF532/H266-75	WHF532/Q266-10 WHF532/H266-10	WHF532/Q266-15 WHF532/H266-15
1/1 532.0 & 1/4 354.7 1/1 532.0 & 1/2 354.7	WHF532/Q354-50 WHF532/H354-50	WHF532/Q354-75 WHF532/H354-75	WHF532/Q354-10 WHF532/H354-10	WHF532/Q354-15 WHF532/H354-15
1/1 532.0 & 1/4 1064.1 1/1 532.0 & 1/2 1064.1	WHF532/Q106-50 WHF532/H106-50	WHF532/Q106-75 WHF532/H106-75	WHF532/Q106-10 WHF532/H106-10	WHF532/Q106-15 WHF532/H106-15
1/1 354.7 & 1/4 266.0 1/1 354.7 & 1/2 266.0	WHF354/Q266-50 WHF354/H266-50	WHF354/Q266-75 WHF354/H266-75	WHF354/Q266-10 WHF354/H266-10	WHF354/Q266-15 WHF354/H266-15
1/1 354.7 & 1/4 532.0 1/1 354.7 & 1/2 532.0	WHF354/Q532-50 WHF354/H532-50	WHF354/Q532-75 WHF354/H532-75	WHF354/Q532-10 WHF354/H532-10	WHF354/Q532-15 WHF354/H532-15
1/1 354.7 & 1/4 1064.1 1/1 354.7 & 1/2 1064.1	WHF354/Q106-50 WHF354/H106-50	WHF354/Q106-75 WHF354/H106-75	WHF354/Q106-10 WHF354/H106-10	WHF354/Q106-15 WHF354/H106-15
1/1 266.0 & 1/4 354.7 1/1 266.0 & 1/2 354.7	WHF266/Q354-50 WHF266/H354-50	WHF266/Q354-75 WHF266/H354-75	WHF266/Q354-10 WHF266/H354-10	WHF266/Q354-15 WHF266/H354-15
1/1 266.0 & 1/4 532.0 1/1 266.0 & 1/2 532.0	WHF266/Q532-50 WHF266/H532-50	WHF266/Q532-75 WHF266/H532-75	WHF266/Q532-10 WHF266/H532-10	WHF266/Q532-15 WHF266/H532-15
1/1 266.0 & 1/4 1064.1 1/1 266.0 & 1/2 1064.1	WHF266/Q106-50 WHF266/H106-50	WHF266/Q106-75 WHF266/H106-75	WHF266/Q106-10 WHF266/H106-10	WHF266/Q106-15 WHF266/H106-15

*For anti-reflection coatings, add AR to the end of the part number.

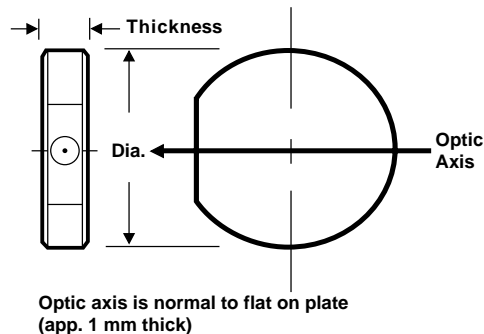
1064.1 nm Harmonic Waveplates



Diameter (Inches)

Specifications:

Material Crystal quartz
 Parallelism Less than 0.5 arc seconds
 Surface Quality 10/5
 Retardation Tolerance 1/300
 Transmitted Wavefront 1/10
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Diameter Inches				
Wavelength (nm)	.500"	.750"	1.00"	1.50"
1/4 1064.1 & 1/4 532.0	WHQ106/Q532-50	WHQ106/Q532-75	WHQ106/Q532-10	WHQ106/Q532-15
1/2 1064.1 & 1/2 532.0	WHH106/H532-50	WHH106/H532-75	WHH106/H532-10	WHH106/H532-15
3/4 1064.1 & 1/2 532.0	WHT106/H532-50	WHT106/H532-75	WHT106/H532-10	WHT106/H532-15
1/4 354.7 & 1/4 532.0	WHQ354/Q532-50	WHQ354/Q532-75	WHQ354/Q532-10	WHQ354/Q532-15
1/2 354.7 & 1/2 532.0	WHH354/H532-50	WHH354/H532-75	WHH354/H532-10	WHH354/H532-15
1/2 354.7 & 1/4 532.0	WHH354/Q532-50	WHH354/Q532-75	WHH354/Q532-10	WHH354/Q532-15

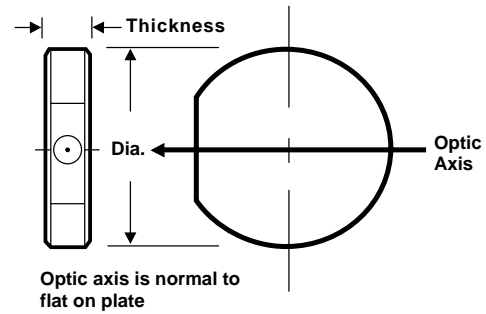
*For anti-reflection coatings, add AR to the end of the part number.

Birefringent Filter Plates



Specifications:

Material Crystal quartz
 Surface Quality 10/5
 Parallelism Less than 1.0 arc second
 Orientation Tolerance ± 5 minutes
 Transmitted Wavefront $\lambda/10$
 Diameter Tolerance $+0.000$ ", -0.005 "
 Clear Aperture Central 90% of diameter



(T= app. 0.5mm)

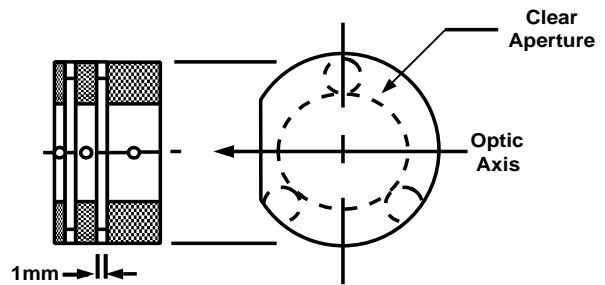
Diameter	Thickness					
	1T	2T	3T	4T	5T	6T
25.4mm (1.00")	BP10-01	BP10-02	BP10-03	BP10-04	BP10-05	BP10-06
30.0mm (1.18")	BP11-01	BP11-02	BP11-03	BP11-04	BP11-05	BP11-06
38.1mm (1.50")	BP15-01	BP15-02	BP15-03	BP15-04	BP15-05	BP15-06
50.8mm (2.00")	BP20-01	BP20-02	BP20-03	BP20-04	BP20-05	BP20-06

Diameter	Thickness				
	8T	10T	12T	15T	20T
25.4mm (1.00")	BP10-08	BP10-10	BP10-12	BP10-15	BP10-20
30.0mm (1.18")	BP11-08	BP11-10	BP11-12	BP11-15	BP11-20
38.1mm (1.50")	BP15-08	BP15-10	BP15-12	BP15-15	BP15-20
50.8mm (2.00")	BP20-08	BP20-10	BP20-12	BP20-15	BP20-20

Birefringent Filter Units (Lyot Filters)



The spacing between the planes will be approximately 1mm.
 The birefringent filter plates are optically contacted as a unit and mounted in an aluminum cell.



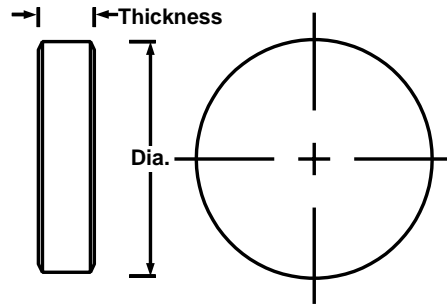
Cell Diameter	Clear Aperture	Plates		
		2	3	4
1.25"	.500"	BU-50-2	BU-50-3	BU-50-4
1.50"	1.00"	BU-10-2	BU-10-3	BU-10-4
2.00"	1.50"	BU-15-2	BU-15-3	BU-15-4
2.50"	2.00"	BU-20-2	BU-20-3	BU-20-4

Crystal Quartz Windows



Specifications:

Material Crystal quartz
 Orientation ± 10.0 arc minutes ("C" axis)
 Parallelism Less than 5 minutes
 Surface Flatness 1.4 @ 632.8nm
 Transmitted Wavefront 1.4 or better
 Surface Quality 10/5
 Diameter Tolerance $+ .000", - .005"$
 Thickness Tolerance $\pm .005"$
 Clear Aperture Central 90% of diameter



Diameter	Thickness			
	.040"	.062"	.125"	.250"
10.0 mm (.393")	WQ39-04	WQ39-06	WQ39-13	WQ39-25
12.7 mm (.500")	WQ50-04	WQ50-06	WQ50-13	WQ50-25
15.0 mm (.591")	WQ59-04	WQ59-06	WQ59-13	WQ59-25
25.4 mm (1.00")	WQ10-04	WQ10-06	WQ10-13	WQ10-25
38.1 mm (1.50")	WQ15-04	WQ15-06	WQ15-13	WQ15-25
50.8 mm (2.00")	WQ20-04	WQ20-06	WQ20-13	WQ20-25

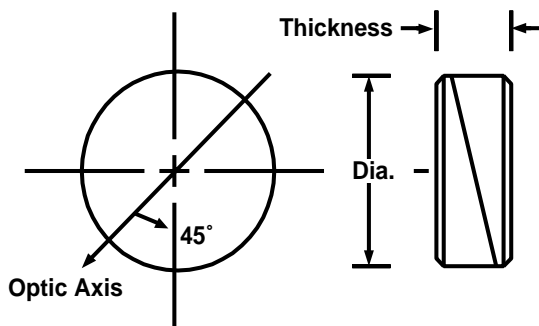
*For anti-reflection coatings, add AR to the end of the part number.

Depolarizers



Specifications:

Material Crystal quartz & fused silica
 Surface Flatness 1/4 @ 632.8nm
 Transmitted Wavefront 1/4
 Surface Quality 10/5
 Wedge 2 degrees
 Diameter Tolerance +.000", -.005"
 Thickness Tolerance ±.030"
 Clear Aperture Central 90% of diameter
 Wavelength Range 248 nm to 2000 nm



Thickness		Part Number
Diameter		
.500"	.170"	D-50
1.000"	.200"	D-10
1.500"	.250"	D-15
2.000"	.400"	D-20

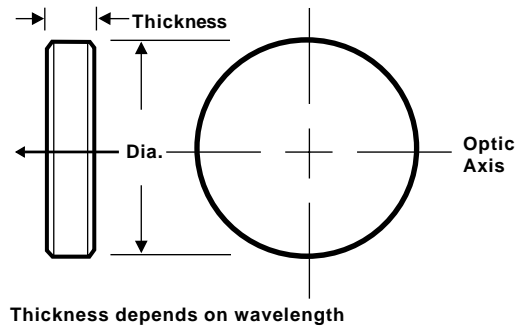
*For anti-reflection coatings, add AR to the end of the part number.

Polarization Rotators 45°, 90°



Specifications:

Material Crystal quartz
 Parallelism Less than 1.0 arc second
 Surface Flatness 1/10 @ 632.8nm
 Transmitted Wavefront 1/10
 Surface Quality 10/5
 Rotation Tolerance ± 10 minutes
 Diameter Tolerance +.000", -.005"
 Clear Aperture Central 90% of diameter



Wavelength (nm)	Diameter (mm)		
	15 mm	20 mm	30 mm
441.6 nm; 45° rotation	PF441-59	PF441-78	PF441-11
441.6 nm; 90° rotation	PN441-59	PN441-78	PN441-11
488.0 nm; 45° rotation	PF488-59	PF488-78	PF488-11
488.0 nm; 90° rotation	PN488-59	PN488-78	PN488-11
514.5 nm; 45° rotation	PF514-59	PF514-78	PF514-11
514.5 nm; 90° rotation	PN514-59	PN514-78	PN514-11
532.0 nm; 45° rotation	PF532-59	PF532-78	PF532-11
532.0 nm; 90° rotation	PN532-59	PN532-78	PN532-11
632.8 nm; 45° rotation	PF632-59	PF632-78	PF632-11
632.8 nm; 90° rotation	PN632-59	PN632-78	PN632-11
694.3 nm; 45° rotation	PF694-59	PF694-78	PF694-11
694.3 nm; 90° rotation	PN694-59	PN694-78	PN694-11
1064.1 nm; 45° rotation	PF106-59	PF106-78	PF106-11
1064.1 nm; 90° rotation	PN106-59	PN106-78	PN106-11
1319.0 nm; 45° rotation	PF132-59	PF132-78	PF132-11
1319.0 nm; 90° rotation	PN132-59	PN132-78	PN132-11

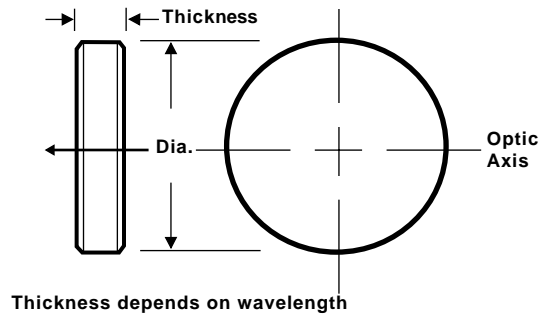
*For anti-reflection coatings, add AR to the end of the part number.

Polarization Rotators 45°, 90°



Specifications:

Material Crystal quartz
 Parallelism Less than 1.0 arc second
 Surface Flatness 1/10 @ 632.8nm
 Transmitted Wavefront 1/10
 Surface Quality 10/5
 Rotation Tolerance ± 10 minutes
 Diameter Tolerance ± .000", -.005"
 Clear Aperture Central 90% of diameter



Wavelength (nm)	Diameter (Inches)		
	.500"	1.00"	1.50"
441.6 nm; 45° rotation	PF441-50	PF441-10	PF441-15
441.6 nm; 90° rotation	PN441-50	PN441-10	PN441-15
488.0 nm; 45° rotation	PF488-50	PF488-10	PF488-15
488.0 nm; 90° rotation	PN488-50	PN488-10	PN488-15
514.5 nm; 45° rotation	PF514-50	PF514-10	PF514-15
514.5 nm; 90° rotation	PN514-50	PN514-10	PN514-15
532.0 nm; 45° rotation	PF532-50	PF532-10	PF532-15
532.0 nm; 90° rotation	PN532-50	PN532-10	PN532-15
632.8 nm; 45° rotation	PF632-50	PF632-10	PF632-15
632.8 nm; 90° rotation	PN632-50	PN632-10	PN632-15
694.3 nm; 45° rotation	PF694-50	PF694-10	PF694-15
694.3 nm; 90° rotation	PN694-50	PN694-10	PN694-15
1064.1 nm; 45° rotation	PF106-50	PF106-10	PF106-15
1064.1 nm; 90° rotation	PN106-50	PN106-10	PN106-15
1319.0 nm; 45° rotation	PF132-50	PF132-10	PF132-15
1319.0 nm; 90° rotation	PN132-50	PN132-10	PN132-15

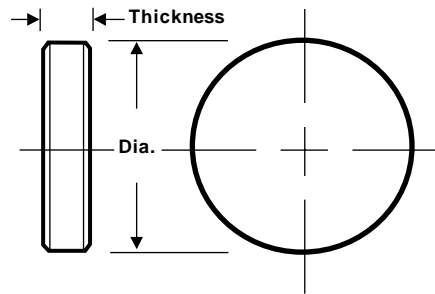
*For anti-reflection coatings, add AR to the end of the part number.

Etalons (Solid)



Specifications:

Material Schlieren grade fused silica
 Parallelism Less than .5 arc seconds
 Surface Flatness 1/20 @ 632.8nm
 Transmitted Wavefront 1/10 -1/20
 Surface Quality 10/5
 Diameter Tolerance +.000", -.005"
 Thickness Tolerance ± .001"
 Clear Aperture Central 90% of diameter



Diameter	Thickness (mm)								
	.05	.10	.15	.20	.25	.30	.50	.75	1.0
12.7 mm (.500")	—	—	—	E50-008	E50-010	E50-012	E50-020	E50-030	E50-039
15.0 mm (.591")	—	—	—	E59-008	E59-010	E59-012	E59-020	E59-030	E59-039
20.0 mm (.787")	E78-002	E78-004	E78-006	E78-008	E78-010	E78-012	E78-020	E78-030	E78-039
25.4 mm (1.00")	E10-002	E10-004	E10-006	E10-008	E10-010	E10-012	E10-020	E10-030	E10-039
30.0 mm (1.18")	E11-002	E11-004	E11-006	E11-008	E11-010	E11-012	E11-020	E11-030	E11-039
38.1 mm (1.50")	E15-002	E15-004	E15-006	E15-008	E15-010	E15-012	E15-020	E15-030	E15-039

Diameter	Thickness (mm)								
	1.5	2.0	2.5	3.0	4.0	5.0	7.5	10	15
12.7 mm (.500")	E50-059	E50-079	E50-098	E50-118	E50-157	E50-197	E50-295	E50-394	E50-591
15.0 mm (.591")	E59-059	E59-079	E59-098	E59-118	E59-157	E59-197	E59-295	E59-394	E59-591
20.0 mm (.787")	E78-059	E78-079	E78-098	E78-118	E78-157	E78-197	E78-295	E78-394	E78-591
25.4 mm (1.00")	E10-059	E10-079	E10-098	E10-118	E10-157	E10-197	E10-295	E10-394	E10-591
30.0 mm (1.18")	E11-059	E11-079	E11-098	E11-118	E11-157	E11-197	E11-295	E11-394	E11-591
38.1 mm (1.50")	E15-059	E15-079	E15-098	E15-118	E15-157	E15-197	E15-295	E15-394	E15-591

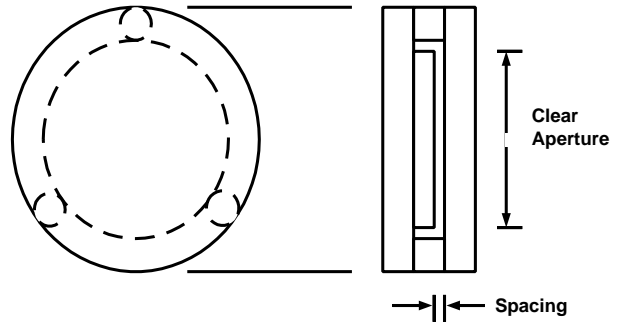
Diameter	Thickness (Inches)			
	.125"	.250"	.375"	.500"
.500"	E50-125	E50-250	E50-375	E50-500
.750"	E75-125	E75-250	E75-375	E75-500
1.00"	E10-125	E10-250	E10-375	E10-500
1.25"	E12-125	E12-250	E12-375	E12-500
1.50"	E15-125	E15-250	E15-375	E15-500
2.00"	E20-125	E20-250	E20-375	E20-500

Etalons (Fixed Air Spaced)



Specifications:

Material Schlieren grade fused silica
 Parallelism Less than .5 arc seconds
 Surface Flatness 1/20 at 632.8 nm
 Surface Quality 10/5



		Spacing					
Cell Diameter	Clear Aperture	5 um	10 um	25 um	50 um	75 um	100 um
1.25" (31.8mm)	12.7mm (.500")	EA50-05u	EA50-10u	EA50-25u	EA50-50u	EA50-75u	EA50-004

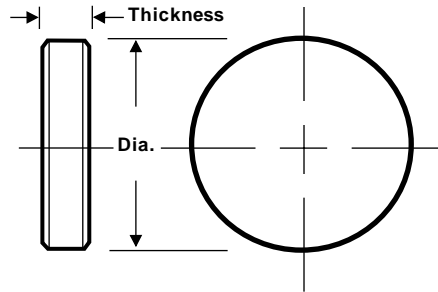
		Spacing					
Cell Diameter	Clear Aperture	.25 mm	.50 mm	.75 mm	1.0 mm	2.0 mm	3.0 mm
1.25" (31.8mm)	12.7mm (.500")	EA50-010	EA50-020	EA50-030	EA50-039	EA50-079	EA50-118
2.00" (50.8mm)	25.4mm (1.00")	EA10-010	EA10-020	EA10-030	EA10-039	EA10-079	EA10-118

Flat and Parallel Substrates



Specifications:

Material Schlieren grade fused silica
 Parallelism Less than 2.0 arc seconds
 Surface Flatness 1/10 at 632.8 nm
 Transmitted Wavefront 1/10
 Surface Quality 10/5
 Diameter Tolerance +.000", -.005"
 Thickness Tolerance ± .003"
 Clear Aperture Central 90% of diameter



Diameter	Thickness (mm)								
	.05	.10	.15	.20	.25	.30	.50	.75	1.0
12.7 mm (.500")	—	—	—	FP50-008	FP50-010	FP50-012	FP50-020	FP50-030	FP50-039
15.0 mm (.591")	—	—	—	FP59-008	FP59-010	FP59-012	FP59-020	FP59-030	FP59-039
20.0 mm (.787")	FP78-002	FP78-004	FP78-006	FP78-008	FP78-010	FP78-012	FP78-020	FP78-030	FP78-039
25.4 mm (1.00")	FP10-002	FP10-004	FP10-006	FP10-008	FP10-010	FP10-012	FP10-020	FP10-030	FP10-039
30.0 mm (1.18")	FP11-002	FP11-004	FP11-006	FP11-008	FP11-010	FP11-012	FP11-020	FP11-030	FP11-039
38.1 mm (1.50")	FP15-002	FP15-004	FP15-006	FP15-008	FP15-010	FP15-012	FP15-020	FP15-030	FP15-039

Diameter	Thickness (mm)								
	1.5	2.0	2.5	3.0	4.0	5.0	7.5	10	15
12.7 mm (.500")	FP50-059	FP50-079	FP50-098	FP50-118	FP50-157	FP50-197	FP50-295	—	—
15.0 mm (.591")	FP59-059	FP59-079	FP59-098	FP59-118	FP59-157	FP59-197	FP59-295	FP59-394	—
20.0 mm (.787")	FP78-059	FP78-079	FP78-098	FP78-118	FP78-157	FP78-197	FP78-295	FP78-394	FP78-591
25.4 mm (1.00")	FP10-059	FP10-079	FP10-098	FP10-118	FP10-157	FP10-197	FP10-295	FP10-394	FP10-591
30.0 mm (1.18")	FP11-059	FP11-079	FP11-098	FP11-118	FP11-157	FP11-197	FP11-295	FP11-394	FP11-591
38.1 mm (1.50")	FP15-059	FP15-079	FP15-098	FP15-118	FP15-157	FP15-197	FP15-295	FP15-394	FP15-591

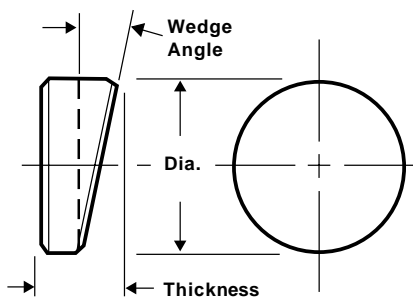
Diameter	Thickness (Inches)			
	.125"	.250"	.375"	.500"
.500"	FP50-125	FP50-250	FP50-375	FP50-500
.750"	FP75-125	FP75-250	FP75-375	FP75-500
1.00"	FP10-125	FP10-250	FP10-375	FP10-500
1.25"	FP12-125	FP12-250	FP12-375	FP12-500
1.50"	FP15-125	FP15-250	FP15-375	FP15-500
2.00"	FP20-125	FP20-250	FP20-375	FP20-500

Flat Mirror Substrates (5, 30 Minute Wedge)



Specifications:

Material Schlieren grade fused silica
 Surface Flatness 1/10 @ 632.8nm
 Surface Quality 10/5 (Both Sides)
 Diameter Tolerance +.000", -.005"
 Thickness Tolerance ± .010"
 Clear Aperture Central 90% of diameter



Flat Mirror Substrates 5 min Wedge

Diameter	Thickness			
	.250"	.375"	.393"	.500"
9.5 mm (.375")	FM5-37-250	FM5-37-375	—	—
12.7 mm (.500")	FM5-50-250	FM5-50-375	—	—
15.0 mm (.591")	FM5-59-250	FM5-59-375	FM5-59-394	FM5-59-500
19.0 mm (.750")	FM5-75-250	FM5-75-375	FM5-75-394	FM5-75-500
25.4 mm (1.00")	FM5-10-250	FM5-10-375	FM5-10-394	FM5-10-500
38.1 mm (1.50")	FM5-15-250	FM5-15-375	FM5-15-394	FM5-15-500
50.8 mm (2.00")	FM5-20-250	FM5-20-375	FM5-20-394	FM5-20-500
76.2 mm (3.00")	—	FM5-30-375	FM5-30-394	FM5-30-500
101.6 mm (4.00")	—	FM5-40-375	FM5-40-394	FM5-40-500
127.1 mm (5.00")	—	FM5-50-375	FM5-50-394	FM5-50-500

Flat Mirror Substrates 30min wedge

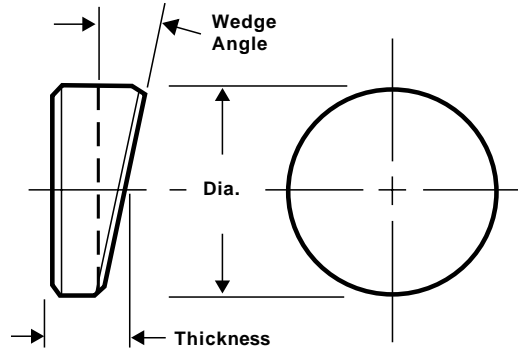
Diameter	Thickness			
	.250"	.375"	.393"	.500"
9.5 mm (.375")	FM3-37-250	FM3-37-375	FM3-37-394	FM3-37-500
12.7 mm (.500")	FM3-50-250	FM3-50-375	FM3-50-394	FM3-50-500
15.0 mm (.591")	FM3-59-250	FM3-59-375	FM3-59-394	FM3-59-500
19.0 mm (.750")	FM3-75-250	FM3-75-375	FM3-75-394	FM3-75-500
25.4 mm (1.00")	FM3-10-250	FM3-10-375	FM3-10-394	FM3-10-500
38.1 mm (1.50")	FM3-15-250	FM3-15-375	FM3-15-394	FM3-15-500
50.8 mm (2.00")	FM3-20-250	FM3-20-375	FM3-20-394	FM3-20-500
76.2 mm (3.00")	—	FM3-30-375	FM3-30-394	FM3-30-500
101.6 mm (4.00")	—	FM3-40-375	FM3-40-394	FM3-40-500
127.1 mm (5.00")	—	FM3-50-375	FM3-50-394	FM3-50-500

Flat Mirror Substrates Large Wedge 1°, 2°



Specifications:

Material Schlieren grade fused silica
 Surface Flatness 1/10 @ 632.8nm
 Surface Quality 10/5 (Both Sides)
 Diameter Tolerance +.000", -.005"
 Thickness Tolerance ± .010"
 Thickness Measured from center
 Clear Aperture Central 90% of diameter



Flat Mirror Substrates 1 deg wedge.

Diameter	Center Thickness		
	.250"	.375"	.500"
12.7 mm (.500")	FM1-50-250	FM1-50-375	FM1-50-500
15.0 mm (.591")	FM1-59-250	FM1-59-375	FM1-59-500
20.0 mm (.787")	FM1-78-250	FM1-78-375	FM1-78-500
25.4 mm (1.00")	FM1-10-250	FM1-10-375	FM1-10-500
38.1 mm (1.50")	FM1-15-250	FM1-15-375	FM1-15-500
50.8 mm (2.00")	—	FM1-20-375	FM1-20-500

Flat Mirror Substrates 2 deg wedge.

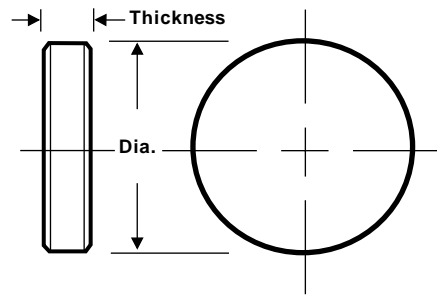
Diameter	Center Thickness		
	.250"	.375"	.500"
12.7 mm (.500")	FM2-50-250	FM2-50-375	FM2-50-500
15.0 mm (.591")	FM2-59-250	FM2-59-375	FM2-59-500
20.0 mm (.787")	FM2-78-250	FM2-78-375	FM2-78-500
25.4 mm (1.00")	FM2-10-250	FM2-10-375	FM2-10-500
38.1 mm (1.50")	FM2-15-250	FM2-15-375	FM2-15-500
50.8 mm (2.00")	—	FM2-20-375	FM2-20-500

Fused Silica Round Windows



Specifications:

Material	Schlieren grade fused silica
Parallelism	Less than 5.0 arc minutes
Surface Flatness	1/4 @ 632.8nm
Transmitted Wavefront	1/4 or better
Surface Quality	10/5
Diameter Tolerance	+ .000", - .005"
Thickness Tolerance	± .010"
Clear Aperture	Central 90% of diameter



Diameter	Thickness			
	1mm	2mm	3mm	4mm
10.0 mm (.394")	GR39-039	GR39-079	GR39-118	GR39-157
15.0 mm (.591")	GR59-039	GR59-079	GR59-118	GR59-157
20.0 mm (.787")	GR78-039	GR78-079	GR78-118	GR78-157
30.0 mm (1.18")	GR11-039	GR11-079	GR11-118	GR11-157

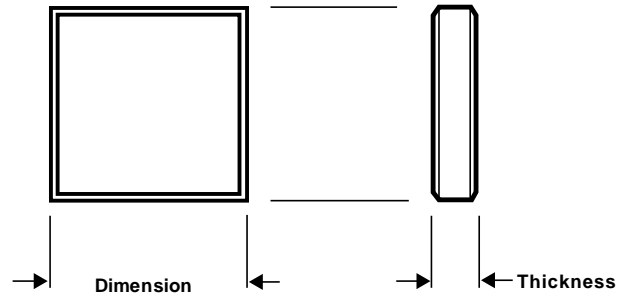
Diameter	Thickness			
	1/32" (.032")	1/16" (.062")	1/8" (.125")	1/4" (.250")
.500" (12.7mm)	GR50-032	GR50-062	GR50-125	GR50-250
.750" (19.0mm)	GR75-032	GR75-062	GR75-125	GR75-250
1.000" (25.4mm)	GR10-032	GR10-062	GR10-125	GR10-250
1.500" (38.1mm)	GR15-032	GR15-062	GR15-125	GR15-250

Fused Silica Square Windows



Specifications:

Material Schlieren grade fused silica
 Parallelism Less than 5.0 arc minutes
 Surface Flatness. 1/4 @ 632.8nm
 Transmitted Wavefront. 1/4 or better
 Surface Quality. 10/5
 Dimension Tolerance. +.000", -.005"
 Thickness Tolerance ± .010"
 Clear Aperture 80% of dimension



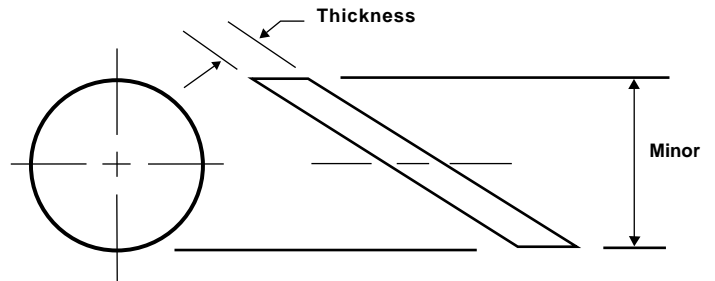
Dimension	Thickness		
	.125"	.250"	.375"
12.7mm x 12.7mm (.500")	GS50-125	GS50-250	GS50-375
25.4mm x 25.4mm (1.00")	GS10-125	GS10-250	GS10-375
38.1mm x 38.1mm (1.50")	GS15-125	GS15-250	GS15-375
50.8mm x 50.8mm (2.00")	GS20-125	GS20-250	GS20-375

Brewster Angle Windows



Specifications:

Material Schlieren grade fused silica
 Parallelism Less than 2.0 arc seconds
 Surface Flatness 1/10 @ 632.8 nm
 Transmitted Wavefront 1/10
 Surface Quality 10/5
 Minor Diameter Tolerance +.000", -.005"
 Thickness Tolerance ± .003"
 Brewster Angle 34 degrees 28 minutes
 Clear Aperture 90% of diameter



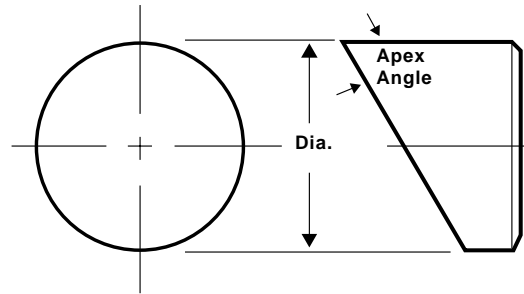
Minor Diameter	Thickness		
	1mm	2mm	3mm
5.0 mm	BA19-039	BA19-079	BA19-118
6.0 mm	BA24-039	BA24-079	BA24-118
6.5 mm	BA26-039	BA26-079	BA26-118
8.0 mm	BA31-039	BA31-079	BA31-118
9.0 mm	BA35-039	BA35-079	BA35-118
10.0 mm	BA39-039	BA39-079	BA39-118
13.0 mm	BA51-039	BA51-079	BA51-118
15.0 mm	BA59-039	BA59-079	BA59-118
16.0 mm	BA63-039	BA63-079	BA63-118
20.0 mm	BA78-039	BA78-079	BA78-118

Littrow Prisms



Specifications:

Material Schlieren grade fused silica
 Surface Flatness 1/10 @ 632.8 nm
 Surface Quality 10/5
 Apex Angle 55°, 32 minutes ± 10 minutes
 Diameter Tolerance +.000", -.005"



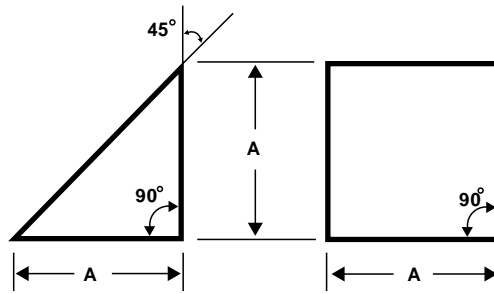
Part Number	
Diameter	
.500"	LP-50
.591"	LP-59
1.000"	LP-10
1.500"	LP-15

Right Angle Prisms



Specifications:

Material Schlieren grade fused silica
 Surface Quality 10/5
 Surface Flatness 1/4 @ 632.8 nm
 Angle Tolerance +5.0 arc minutes
 Dimension Tolerance $\pm .25$ mm



Part Number	
Dimensions A	
12.7 mm (.500") 15.0 mm (.591")	RP-50 RP-59
20.0 mm (.787") 25.4 mm (1.00")	RP-78 RP-10
38.1 mm (1.50") 50.8 mm (2.00")	RP-15 RP-20

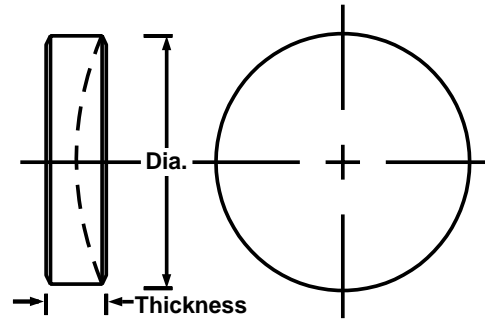
Spherical Mirror Substrates - Plano Concave



(7.75 mm - 15 mm Diameter)

Specifications:

- Material Schlieren grade fused silica
- Surface Quality 10/5
- Surface Accuracy 1/4 @ 632.8nm
- Radius Tolerance ± 1%
- Diameter Tolerance +.000", -.005"
- Thickness Tolerance ± .010"
- Clear Aperture Central 90% of diameter



Diameter x Thickness					
Radius (cm)	7.75mm x 4mm	.500" x .125"	.500" x .250"	.500" x .375"	15mm x 10mm
2.5 cm	MC0-02	MC1-02	MC2-02	MC3-02	MC4-02
5.0 cm	MC0-05	MC1-05	MC2-05	MC3-05	MC4-05
7.5 cm	MC0-07	MC1-07	MC2-07	MC3-07	MC4-07
10.0 cm	MC0-10	MC1-10	MC2-10	MC3-10	MC4-10
15.0 cm	MC0-15	MC1-15	MC2-15	MC3-15	MC4-15
20.0 cm	MC0-20	MC1-20	MC2-20	MC3-20	MC4-20
25.0 cm	MC0-25	MC1-25	MC2-25	MC3-25	MC4-25
30.0 cm	MC0-30	MC1-30	MC2-30	MC3-30	MC4-30
40.0 cm	MC0-40	MC1-40	MC2-40	MC3-40	MC4-40
50.0 cm	MC0-50	MC1-50	MC2-50	MC3-50	MC4-50
60.0 cm	MC0-60	MC1-60	MC2-60	MC3-60	MC4-60
75.0 cm	MC0-75	MC1-75	MC2-75	MC3-75	MC4-75
80.0 cm	MC0-80	MC1-80	MC2-80	MC3-80	MC4-80
90.0 cm	MC0-90	MC1-90	MC2-90	MC3-90	MC4-90

Diameter x Thickness					
Radius (M)	7.75mm x 4mm	.500" x .125"	.500" x .250"	.500" x .375"	15mm x 10mm
1.0 M	MC0-1M	MC1-1M	MC2-1M	MC3-1M	MC4-1M
2.0 M	MC0-2M	MC1-2M	MC2-2M	MC3-2M	MC4-2M
3.0 M	MC0-3M	MC1-3M	MC2-3M	MC3-3M	MC4-3M
4.0 M	MC0-4M	MC1-4M	MC2-4M	MC3-4M	MC4-4M
5.0 M	MC0-5M	MC1-5M	MC2-5M	MC3-5M	MC4-5M
7.0 M	MC0-7M	MC1-7M	MC2-7M	MC3-7M	MC4-7M
8.0 M	MC0-8M	MC1-8M	MC2-8M	MC3-8M	MC4-8M
10.0 M	MC0-9M	MC1-9M	MC2-9M	MC3-9M	MC4-9M

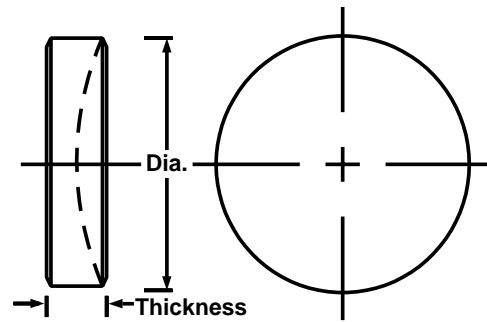
Spherical Mirror Substrates - Plano Concave



(.750" - 1.50" Diameter)

Specifications:

Material Schlieren grade fused silica
 Surface Quality 10/5
 Surface Accuracy 1/4 @ 632.8nm
 Radius Tolerance ± 1%
 Diameter Tolerance + .000", - .005"
 Thickness Tolerance ± .010"
 Clear Aperture Central 90% of diameter



Diameter x Thickness					
Radius (cm)	.750" x .250"	.750" x .375"	1.00" x .250"	1.00" x .375"	1.50" x .375"
2.5 cm	MC5-02	MC6-02	MC7-02	MC8-02	—
5.0 cm	MC5-05	MC6-05	MC7-05	MC8-05	—
7.5 cm	MC5-07	MC6-07	MC7-07	MC8-07	—
10.0 cm	MC5-10	MC6-10	MC7-10	MC8-10	—
15.0 cm	MC5-15	MC6-15	MC7-15	MC8-15	—
20.0 cm	MC5-20	MC6-20	MC7-20	MC8-20	—
25.0 cm	MC5-25	MC6-25	MC7-25	MC8-25	MC9-25
30.0 cm	MC5-30	MC6-30	MC7-30	MC8-30	MC9-30
40.0 cm	MC5-40	MC6-40	MC7-40	MC8-40	MC9-40
50.0 cm	MC5-50	MC6-50	MC7-50	MC8-50	MC9-50
60.0 cm	MC5-60	MC6-60	MC7-60	MC8-60	MC9-60
75.0 cm	MC5-75	MC6-75	MC7-75	MC8-75	MC9-75
80.0 cm	MC5-80	MC6-80	MC7-80	MC8-80	MC9-80
90.0 cm	MC5-90	MC6-90	MC7-90	MC8-90	MC9-90

Diameter x Thickness					
Radius (M)	.750" x .250"	.750" x .375"	1.00" x .250"	1.00" x .375"	1.50" x .375"
1.0 M	MC5-1M	MC6-1M	MC7-1M	MC8-1M	MC9-1M
2.0 M	MC5-2M	MC6-2M	MC7-2M	MC8-2M	MC9-2M
3.0 M	MC5-3M	MC6-3M	MC7-3M	MC8-3M	MC9-3M
4.0 M	MC5-4M	MC6-4M	MC7-4M	MC8-4M	MC9-4M
5.0 M	MC5-5M	MC6-5M	MC7-5M	MC8-5M	MC9-5M
7.0 M	MC5-7M	MC6-7M	MC7-7M	MC8-7M	MC9-7M
8.0 M	MC5-8M	MC6-8M	MC7-8M	MC8-8M	MC9-8M
10.0 M	MC5-9M	MC6-9M	MC7-9M	MC8-9M	MC9-9M

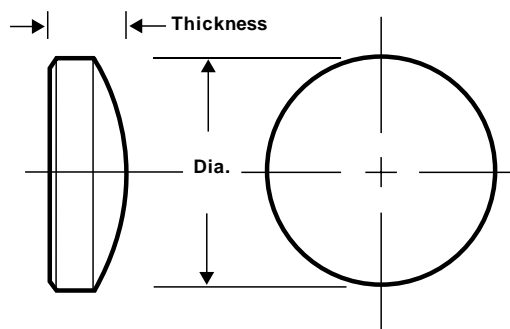
Spherical Mirror Substrates - Plano Convex



(7.75 mm - 15 mm Diameter)

Specifications:

Material Schlieren grade fused silica
 Surface Quality 10/5
 Surface Accuracy 1/4 @ 632.8nm
 Radius Tolerance ± 1%
 Diameter Tolerance + .000", - .005"
 Thickness Tolerance ± .010"
 Clear Aperture Central 90% of diameter



Diameter x Thickness						
Radius (cm)	7.75mm x 4mm	.500" x .125"	.500" x .250"	.500" x .375"	15mm x 10mm	
2.5 cm	MX0-02	MX1-02	MX2-02	MX3-02	MX4-02	
5.0 cm	MX0-05	MX1-05	MX2-05	MX3-05	MX4-05	
7.5 cm	MX0-07	MX1-07	MX2-07	MX3-07	MX4-07	
10.0 cm	MX0-10	MX1-10	MX2-10	MX3-10	MX4-10	
15.0 cm	MX0-15	MX1-15	MX2-15	MX3-15	MX4-15	
20.0 cm	MX0-20	MX1-20	MX2-20	MX3-20	MX4-20	
25.0 cm	MX0-25	MX1-25	MX2-25	MX3-25	MX4-25	
30.0 cm	MX0-30	MX1-30	MX2-30	MX3-30	MX4-30	
40.0 cm	MX0-40	MX1-40	MX2-40	MX3-40	MX4-40	
50.0 cm	MX0-50	MX1-50	MX2-50	MX3-50	MX4-50	
60.0 cm	MX0-60	MX1-60	MX2-60	MX3-60	MX4-60	
75.0 cm	MX0-75	MX1-75	MX2-75	MX3-75	MX4-75	
80.0 cm	MX0-80	MX1-80	MX2-80	MX3-80	MX4-80	
90.0 cm	MX0-90	MX1-90	MX2-90	MX3-90	MX4-90	

Diameter x Thickness						
Radius (M)	7.75mm x 4mm	.500" x .125"	.500" x .250"	.500" x .375"	15mm x 10mm	
1.0 M	MX0-1M	MX1-1M	MX2-1M	MX3-1M	MX4-1M	
2.0 M	MX0-2M	MX1-2M	MX2-2M	MX3-2M	MX4-2M	
3.0 M	MX0-3M	MX1-3M	MX2-3M	MX3-3M	MX4-3M	
4.0 M	MX0-4M	MX1-4M	MX2-4M	MX3-4M	MX4-4M	
5.0 M	MX0-5M	MX1-5M	MX2-5M	MX3-5M	MX4-5M	
7.0 M	MX0-7M	MX1-7M	MX2-7M	MX3-7M	MX4-7M	
8.0 M	MX0-8M	MX1-8M	MX2-8M	MX3-8M	MX4-8M	
10.0 M	MX0-9M	MX1-9M	MX2-9M	MX3-9M	MX4-9M	

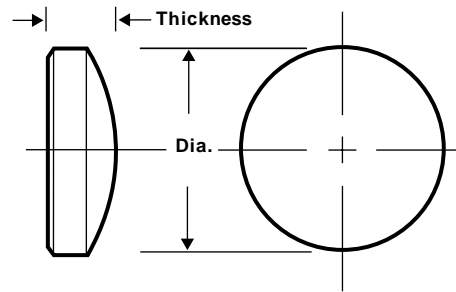
Spherical Mirror Substrates - Plano Convex



(.750" - 1.50" Diameter)

Specifications:

Material Schlieren grade fused silica
 Surface Quality 10/5
 Surface Accuracy 1/4 @ 632.8nm
 Radius Tolerance ± 1%
 Diameter Tolerance + .000", - .005"
 Thickness Tolerance ± .010"
 Clear Aperture Central 90% of diameter



Diameter x Thickness					
Radius (cm)	.750" x .250"	.750" x .375"	1.00" x .250"	1.00" x .375"	1.50" x .375"
2.5 cm	MX5-02	MX6-02	MX7-02	MX8-02	—
5.0 cm	MX5-05	MX6-05	MX7-05	MX8-05	—
7.5 cm	MX5-07	MX6-07	MX7-07	MX8-07	—
10.0 cm	MX5-10	MX6-10	MX7-10	MX8-10	—
15.0 cm	MX5-15	MX6-15	MX7-15	MX8-15	—
20.0 cm	MX5-20	MX6-20	MX7-20	MX8-20	—
25.0 cm	MX5-25	MX6-25	MX7-25	MX8-25	MX9-25
30.0 cm	MX5-30	MX6-30	MX7-30	MX8-30	MX9-30
40.0 cm	MX5-40	MX6-40	MX7-40	MX8-40	MX9-40
50.0 cm	MX5-50	MX6-50	MX7-50	MX8-50	MX9-50
60.0 cm	MX5-60	MX6-60	MX7-60	MX8-60	MX9-60
75.0 cm	MX5-75	MX6-75	MX7-75	MX8-75	MX9-75
80.0 cm	MX5-80	MX6-80	MX7-80	MX8-80	MX9-80
90.0 cm	MX5-90	MX6-90	MX7-90	MX8-90	MX9-90

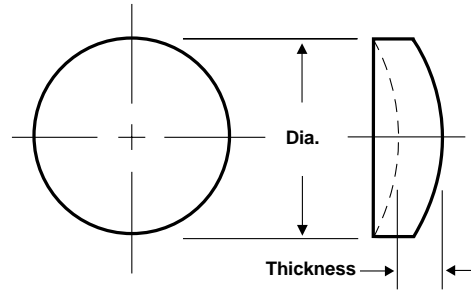
Diameter x Thickness					
Radius (M)	.750" x .250"	.750" x .375"	1.00" x .250"	1.00" x .375"	1.50" x .375"
1.0 M	MX5-1M	MX6-1M	MX7-1M	MX8-1M	MX9-1M
2.0 M	MX5-2M	MX6-2M	MX7-2M	MX8-2M	MX9-2M
3.0 M	MX5-3M	MX6-3M	MX7-3M	MX8-3M	MX9-3M
4.0 M	MX5-4M	MX6-4M	MX7-4M	MX8-4M	MX9-4M
5.0 M	MX5-5M	MX6-5M	MX7-5M	MX8-5M	MX9-5M
7.0 M	MX5-7M	MX6-7M	MX7-7M	MX8-7M	MX9-7M
8.0 M	MX5-8M	MX6-8M	MX7-8M	MX8-8M	MX9-8M
10.0 M	MX5-9M	MX6-9M	MX7-9M	MX8-9M	MX9-9M

Unstable Resonator Output Couplers



Specifications:

Material..... Schlieren grade fused silica
 Surface Quality 10/5
 Concentricity Less than 10.0 arc minutes
 Surface Accuracy..... 1/4 @ 632.8nm
 Diameter Tolerance +.000",-.005"
 Center Thickness250" Nominal



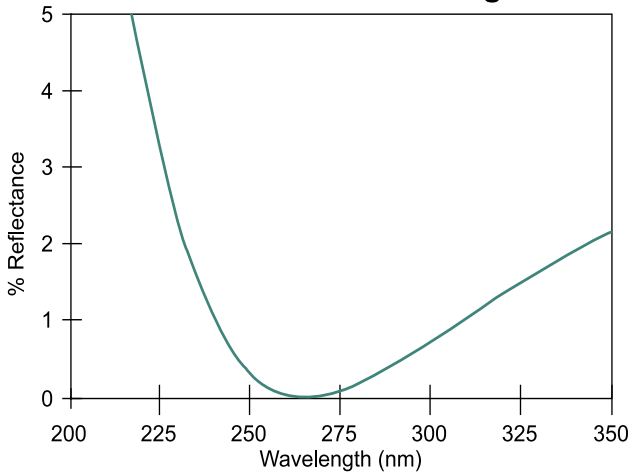
Radius of Curvature					
Diameter	10.0 cm	12.5 cm	15.0 cm	20.0 cm	25.0 cm
19.1mm (.750")	UR75-10	UR75-12	UR75-15	UR75-20	UR75-25
25.4mm (1.00")	UR10-10	UR10-12	UR10-15	UR10-20	UR10-25
38.1mm (1.50")	UR15-10	UR15-12	UR15-15	UR15-20	UR15-25
50.8mm (2.00")	UR20-10	UR20-12	UR20-15	UR20-20	UR20-25

Radius of Curvature					
Diameter	30.0 cm	40.0 cm	50.0 cm	75.0 cm	100.0 cm
19.1mm (.750")	UR75-30	UR75-40	UR75-50	UR75-75	UR75-1M
25.4mm (1.00")	UR10-30	UR10-40	UR10-50	UR10-75	UR10-1M
38.1mm (1.50")	UR15-30	UR15-40	UR15-50	UR15-75	UR15-1M
50.8mm (2.00")	UR20-30	UR20-40	UR20-50	UR20-75	UR20-1M

Nd:YAG Coatings (266nm)



Antireflection Coatings



Standard:

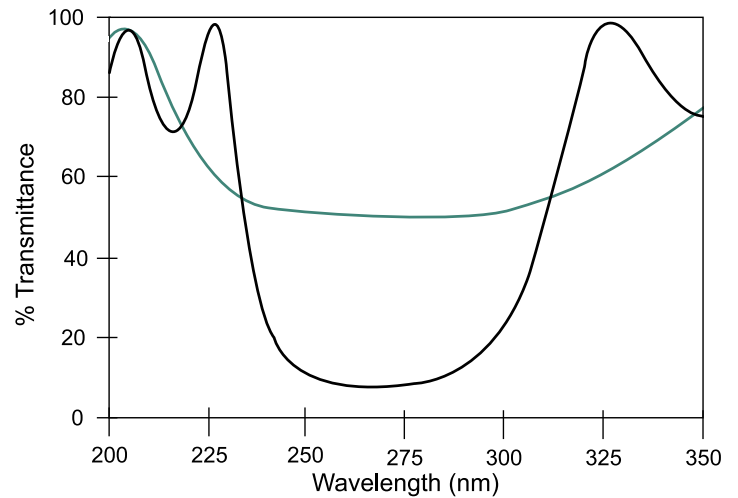
R < 0.25% per side
 Damage threshold > 5 J/ cm², 3-5 nsec pulse.

1 Side	2 Side
1001	1002

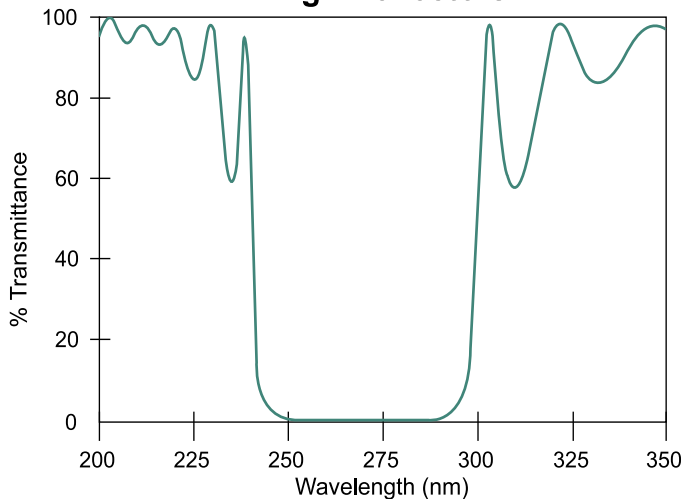
Other reflectances are available as non-standard items. Damage threshold > 5 J/ cm², 3-5 nsec pulse.

Standard R (%)	Part number
90 ± 1	1003
80 ± 2	1004
70 ± 2	1005
60 ± 2.5	1006
50 ± 2.5	1007
40 ± 2.5	1008
30 ± 2	1009
20 ± 2	1010
10 ± 1	1011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

R_R > 98.5%, R_p > 98% and R_s > 99%
 Damage threshold > 5 J/ cm², 3-5 nsec pulse.

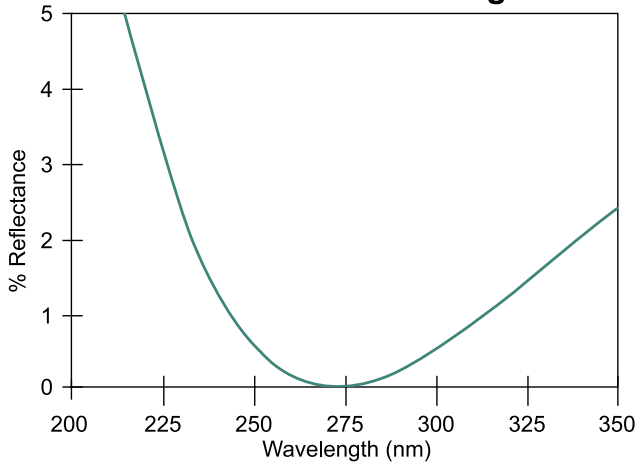
HR at 0°	HR at 45°	Pol.
	1112	R
1012	1113	S
	1114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Ar Ion Coatings (333-364nm)



Antireflection Coatings



Standard:

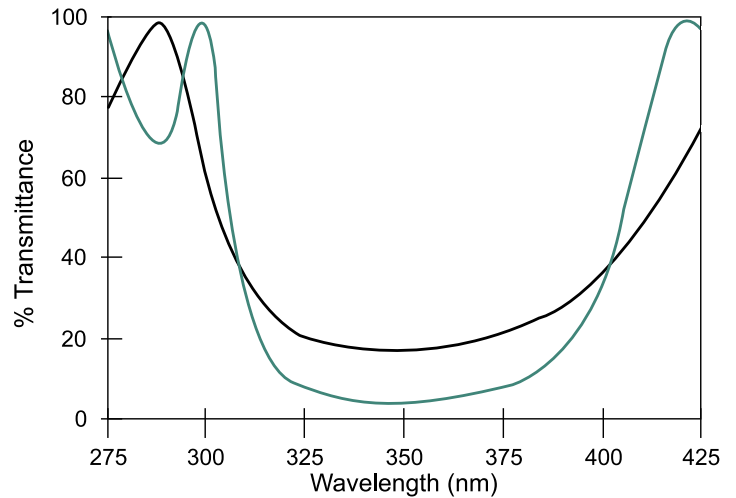
R < 0.25% per side
Damage threshold > 1 kw / cm².

1 Side	2 Side
2001	2002

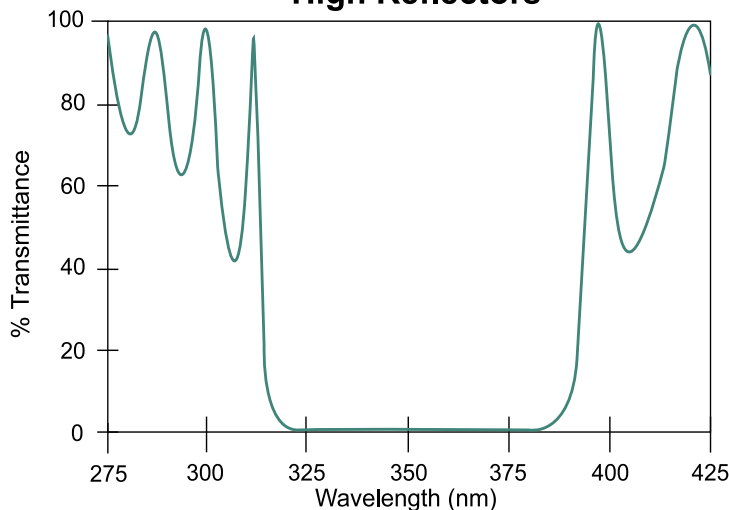
Other reflectances are available as non-standard items. Damage threshold > 1 kw / cm².

Standard R (%)	Part number
90 ± 1	2003
80 ± 2	2004
70 ± 2	2005
60 ± 2.5	2006
50 ± 2.5	2007
40 ± 2.5	2008
30 ± 2	2009
20 ± 2	2010
10 ± 1	2011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

R_R > 98.5%, R_p > 98% and R_s > 99%
Damage threshold > 1 kw / cm².

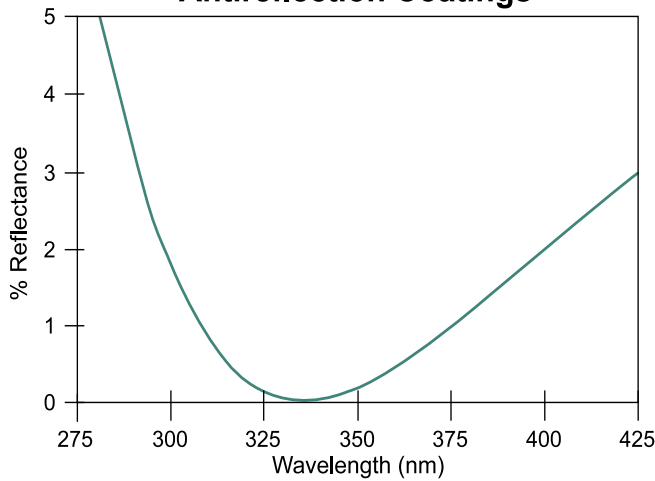
HR at 0°	HR at 45°	Pol.
	2112	R
2012	2113	S
	2114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

N₂ Coatings (337nm)



Antireflection Coatings



Standard:

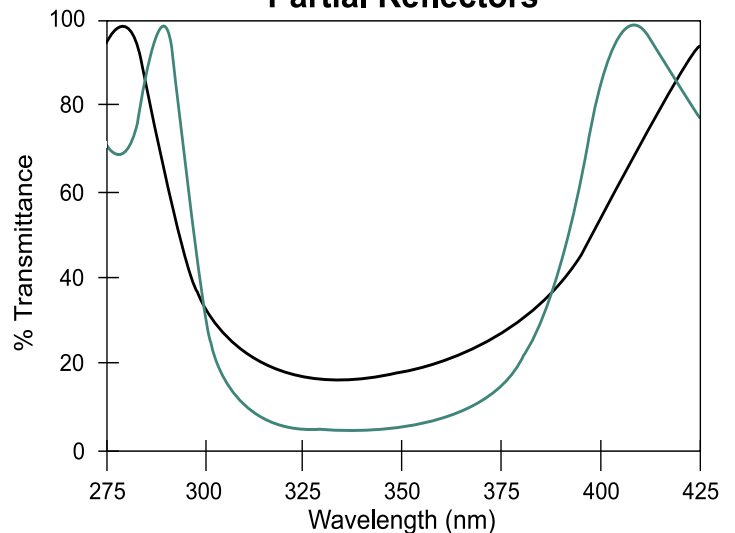
R < 0.25% per side
Damage threshold > 1 kw / cm².

1 Side	2 Side
3001	3002

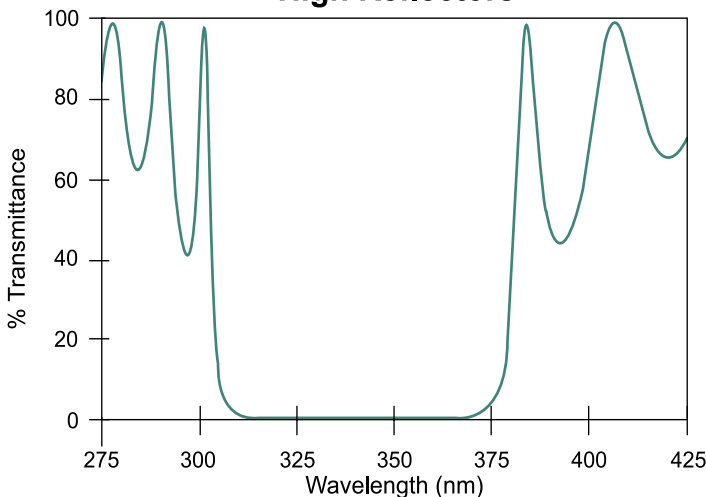
Other reflectances are available as non-standard items. Damage threshold > 1 kw / cm².

Standard R (%)	Part number
90 ± 1	3003
80 ± 2	3004
70 ± 2	3005
60 ± 2.5	3006
50 ± 2.5	3007
40 ± 2.5	3008
30 ± 2	3009
20 ± 2	3010
10 ± 1	3011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

R_R > 98.5%, R_P > 98% and R_S > 99%
Damage threshold > 1 kw / cm².

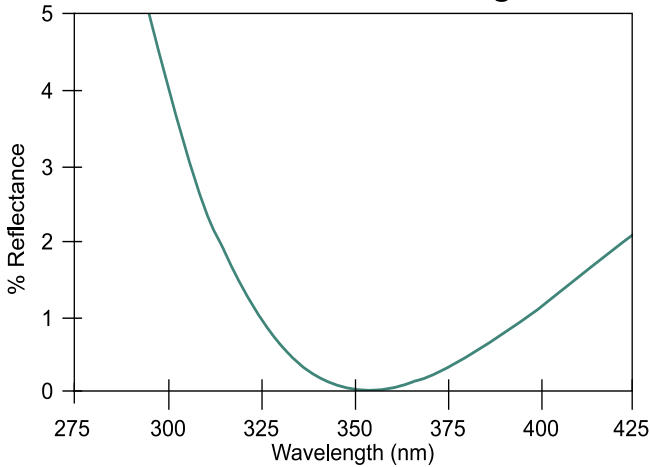
HR at 0°	HR at 45°	Pol.
	3112	R
3012	3113	S
	3114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Nd:YAG Coatings (355nm)



Antireflection Coatings



Standard:

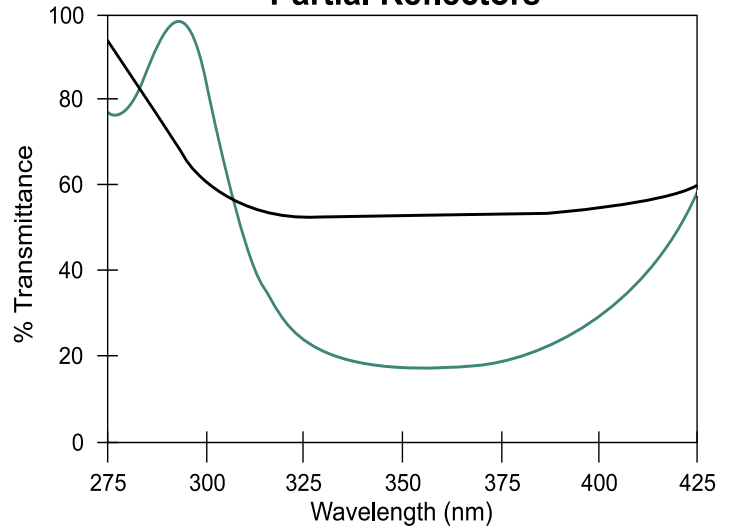
$R < 0.25\%$ per side
 Damage threshold $> 5 \text{ J/cm}^2$, 3-5 nsec pulse.

1 Side	2 Side
4001	4002

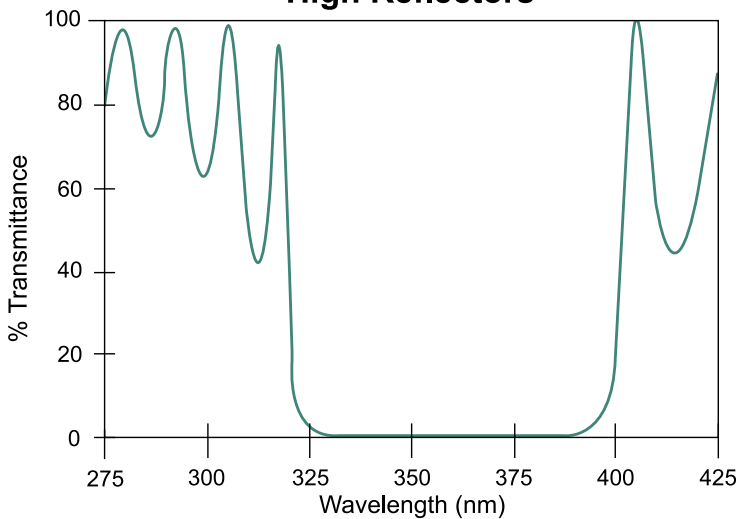
Other reflectances are available as non-standard items. Damage threshold $> 5 \text{ J/cm}^2$, 3-5 nsec pulse.

Standard R (%)	Part number
90 ± 1	4003
80 ± 2	4004
70 ± 2	4005
60 ± 2.5	4006
50 ± 2.5	4007
40 ± 2.5	4008
30 ± 2	4009
20 ± 2	4010
10 ± 1	4011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45° , please specify polarization.

$R_R > 98.5\%$, $R_p > 98\%$ and $R_s > 99\%$
 Damage threshold $> 5 \text{ J/cm}^2$, 3-5 nsec pulse.

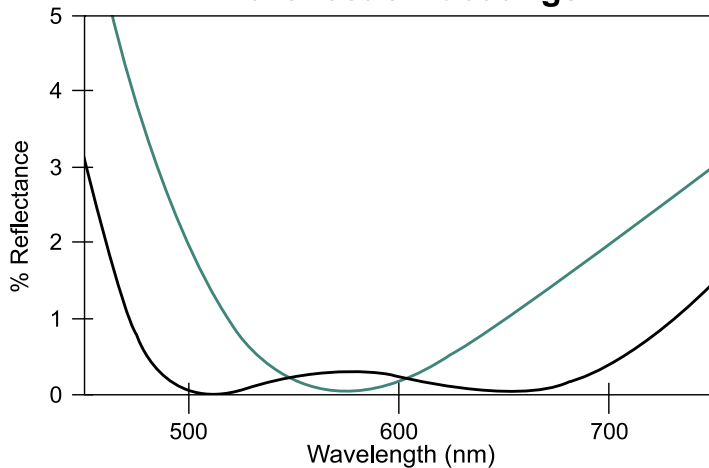
HR at 0°	HR at 45°	Pol.
	4112	R
4012	4113	S
	4114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Ar Ion Coatings (458-528nm)



Antireflection Coatings



Standard:

— $R < 0.25\%$ per side
Damage threshold $> 2.5 \text{ kw/cm}^2$.

1 Side	2 Side
5001	5002

Broad Band:

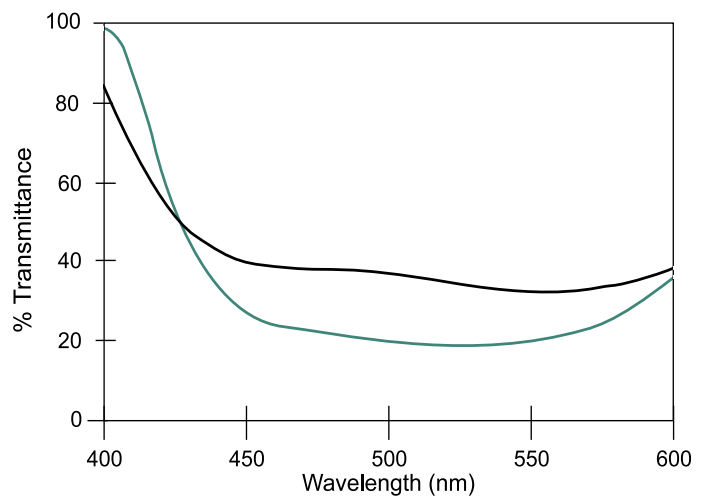
— BBAR $< 0.25\%$ average per side
Damage threshold $> 2.5 \text{ kw/cm}^2$.

1 Side	2 Side
5031	5032

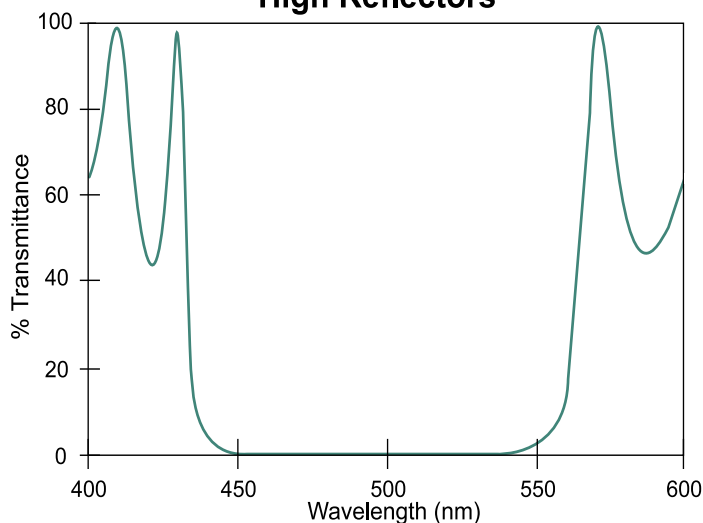
Other reflectances are available as non-standard items. Damage threshold $> 2.5 \text{ kw/cm}^2$.

Standard R (%)	Part number
90 ± 1	5003
80 ± 2	5004
70 ± 2	5005
60 ± 2.5	5006
50 ± 2.5	5007
40 ± 2.5	5008
30 ± 2	5009
20 ± 2	5010
10 ± 1	5011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45° , please specify polarization.

$R_R > 99\%$, $R_P > 98.5\%$ and $R_S > 99.5\%$
Damage threshold $> 2.5 \text{ kw/cm}^2$.

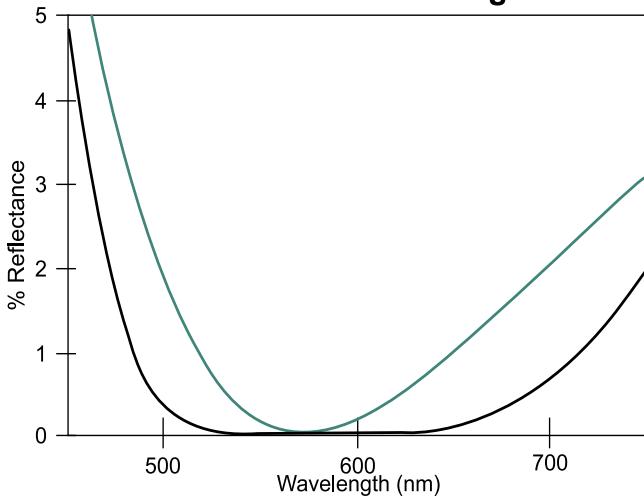
HR at 0°	HR at 45°	Pol.
5012	5112	R
	5113	S
	5114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Kr Ion / HeNe Coatings (520-647nm)



Antireflection Coatings



Standard:

- R < 0.25% per side
- Damage threshold > 2.5 kw / cm²

1 Side	2 Side
6001	6002

Broad Band:

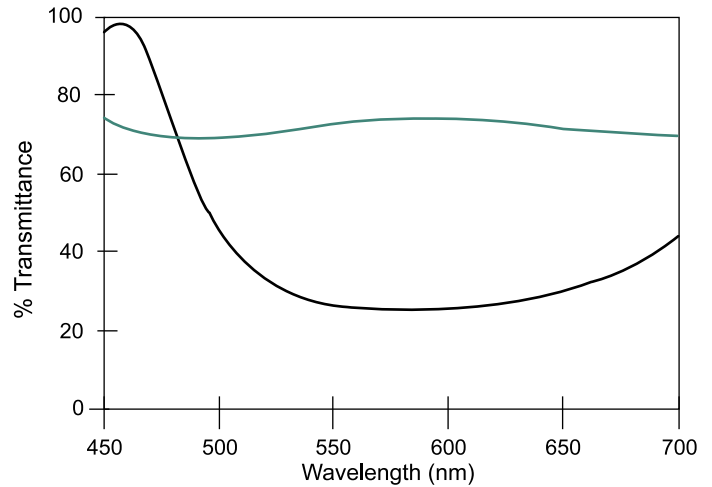
- BBAR < 0.25% average per side
- Damage threshold > 2.5 kw / cm².

1 Side	2 Side
6031	6032

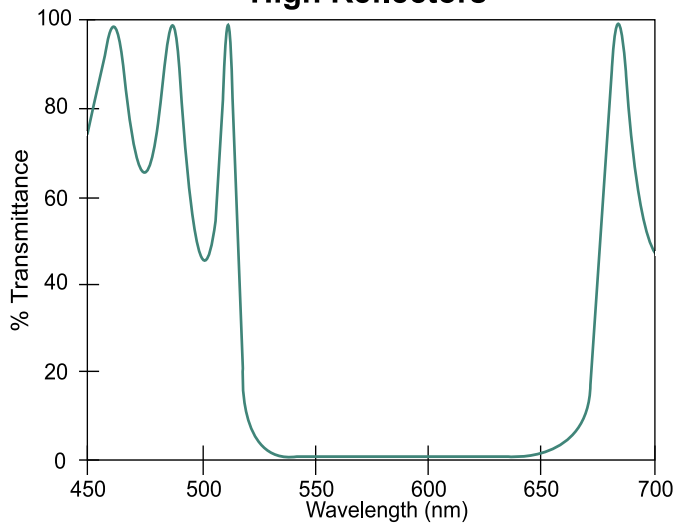
Other reflectances are available as non-standard items. Damage threshold > 2.5 kw / cm².

Standard R (%)	Part number
90 ± 1	6003
80 ± 2	6004
70 ± 2	6005
60 ± 2.5	6006
50 ± 2.5	6007
40 ± 2.5	6008
30 ± 2	6009
20 ± 2	6010
10 ± 1	6011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

R_R > 99%, R_P > 98.5% and R_S > 99.5%
Damage threshold > 2.5 kw / cm².

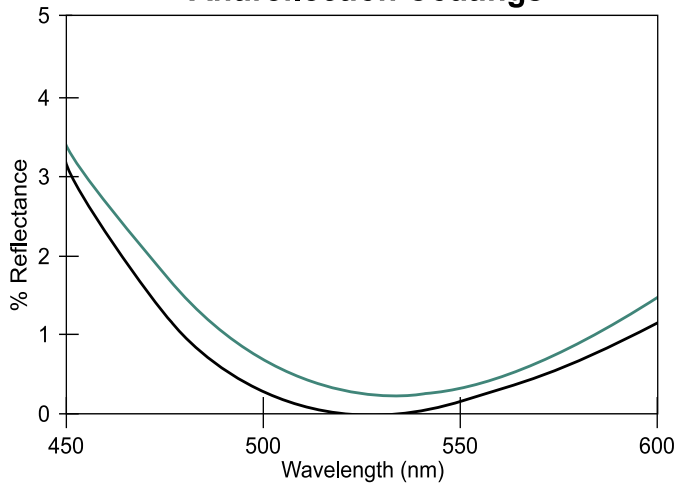
HR at 0°	HR at 45°	Pol.
	6112	R
6012	6113	S
	6114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Nd:YAG Coatings (532nm)



Antireflection Coatings



Standard:

— $R < 0.25\%$ per side
Damage threshold $> 15 \text{ J/cm}^2$, 10 nsec pulse.

1 Side	2 Side
7001	7002

Ultra-low reflection (ULR):

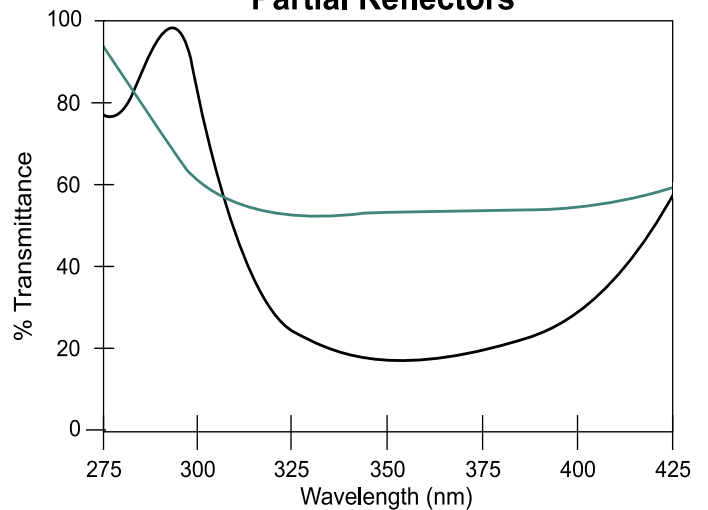
— $R < 0.15\%$ per side
Damage threshold $> 20 \text{ J/cm}^2$, 10 nsec pulse.

1 Side	2 Side
7021	7022

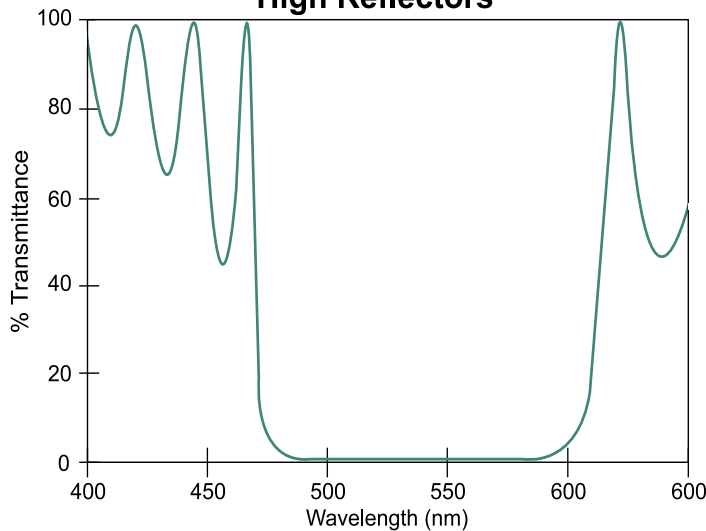
Other reflectances are available as non-standard items. Damage threshold $> 20 \text{ J/cm}^2$, 10 nsec pulse.

Standard R (%)	Part number
90 ± 1	7003
80 ± 2	7004
70 ± 2	7005
60 ± 2.5	7006
50 ± 2.5	7007
40 ± 2.5	7008
30 ± 2	7009
20 ± 2	7010
10 ± 1	7011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45° , please specify polarization.

$R_R > 99.5\%$, $R_p > 99.25\%$ and $R_s > 99.75\%$
Damage threshold $> 20 \text{ J/cm}^2$, 10 nsec pulse.

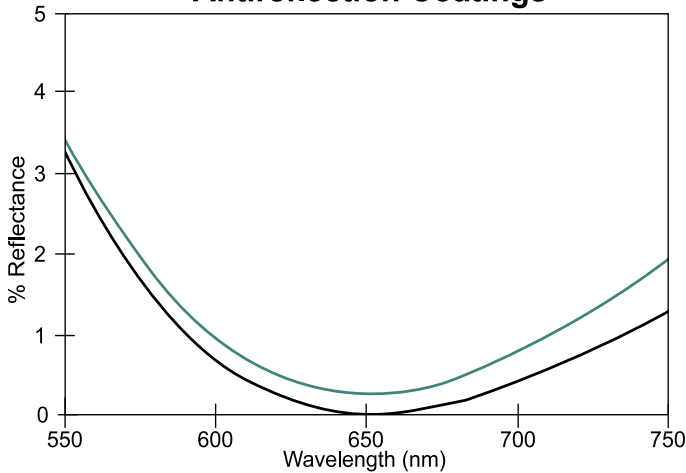
HR at 0°	HR at 45°	Pol.
	7112	R
7012	7113	S
	7114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

HeNe / Diode Coatings (630-670nm)



Antireflection Coatings



Standard:

— R < 0.25% per side

1 Side	2 Side
8001	8002

Ultra-low reflection (ULR):

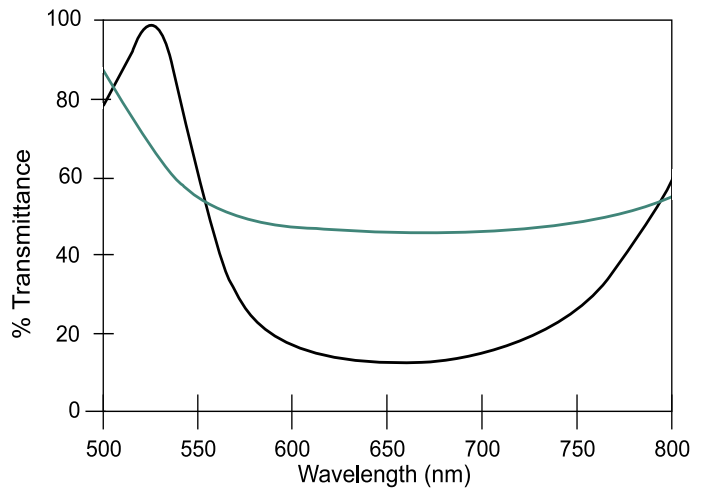
— R < 0.1% per side

1 Side	2 Side
8021	8022

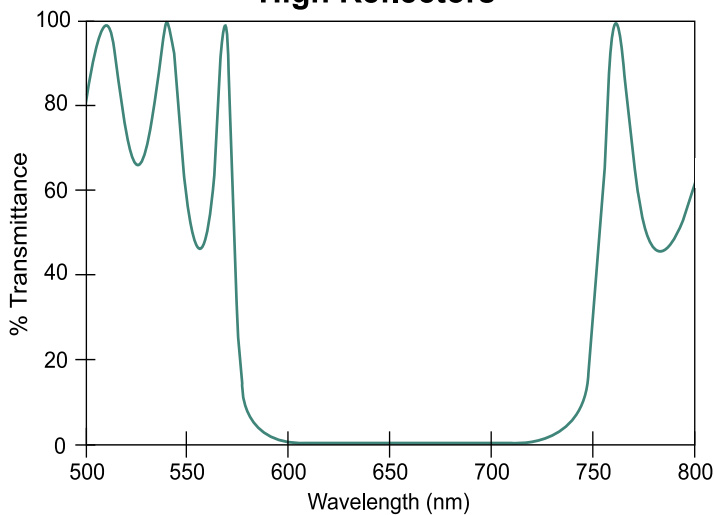
Other reflectances are available as non-standard items.

Standard R (%)	Part number
90 ± 1	8003
80 ± 2	8004
70 ± 2	8005
60 ± 2.5	8006
50 ± 2.5	8007
40 ± 2.5	8008
30 ± 2	8009
20 ± 2	8010
10 ± 1	8011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

$R_R > 99.5\%$, $R_P > 99.25\%$ and $R_S > 99.75\%$

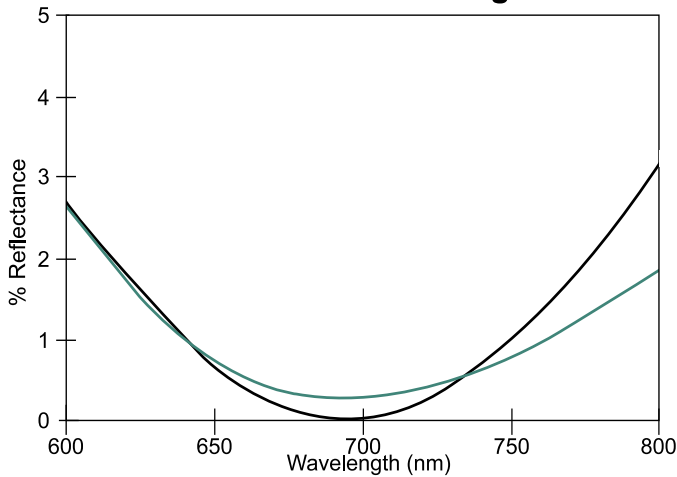
HR at 0°	HR at 45°	Pol.
	8112	R
8012	8113	S
	8114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Ruby Coatings (694nm)



Antireflection Coatings



Standard:

— R < 0.25% per side
Damage threshold > 15 J/ cm², 10 nsec pulse.

1 Side	2 Side
9001	9002

Ultra-low reflection (ULR):

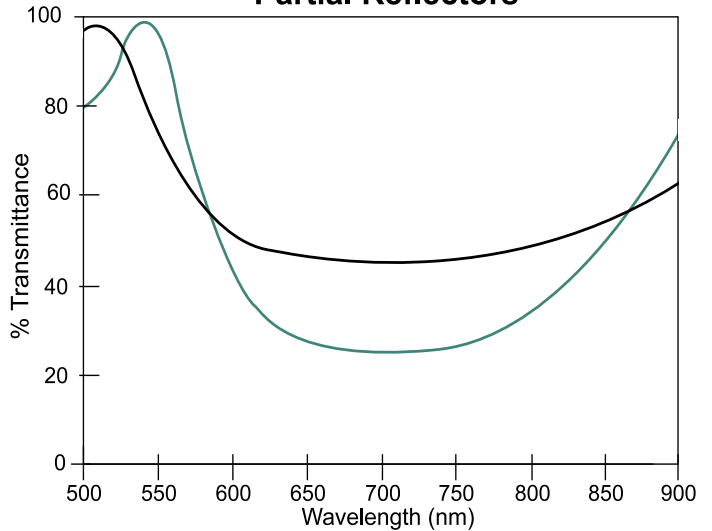
— R < 0.1% per side on any substrate (non standard) Damage threshold > 30 J/ cm², 10 nsec pulse

1 Side	2 Side
9021	9022

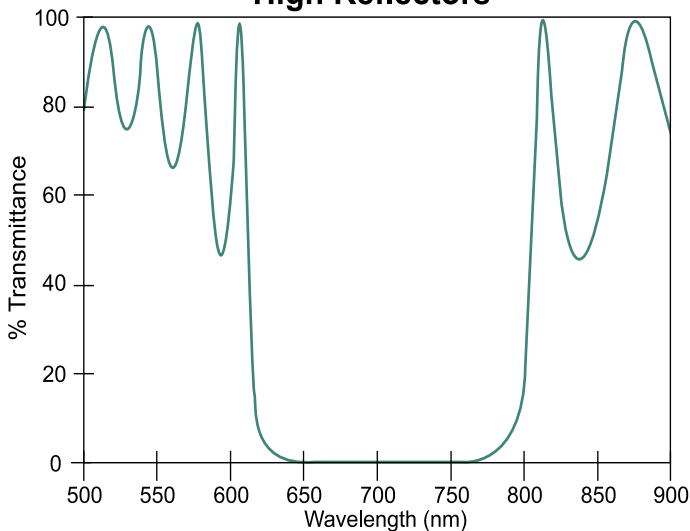
Other reflectances are available as non-standard items. Damage threshold > 30 J/ cm², 10 nsec pulse

Standard R (%)	Part number
90 ± 1	9003
80 ± 2	9004
70 ± 2	9005
60 ± 2.5	9006
50 ± 2.5	9007
40 ± 2.5	9008
30 ± 2	9009
20 ± 2	9010
10 ± 1	9011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

R_R > 99.5%, R_p > 99.25% and R_s > 99.75%
Damage threshold > 30 J/ cm², 10 nsec pulse.

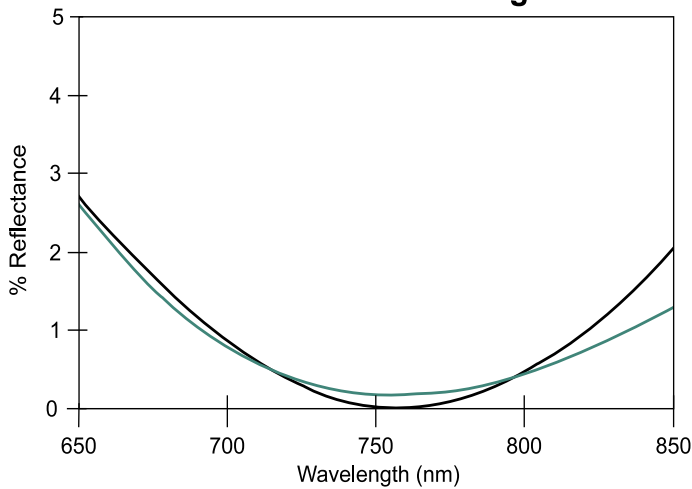
HR at 0°	HR at 45°	Pol.
	9012	R
9012	9013	S
	9014	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Alexandrite Coatings (755nm)



Antireflection Coatings



Standard:

- R < 0.25% per side
- Damage threshold > 15 J/ cm², 10 nsec pulse

1 Side	2 Side
10001	10002

Ultra-low reflection (ULR):

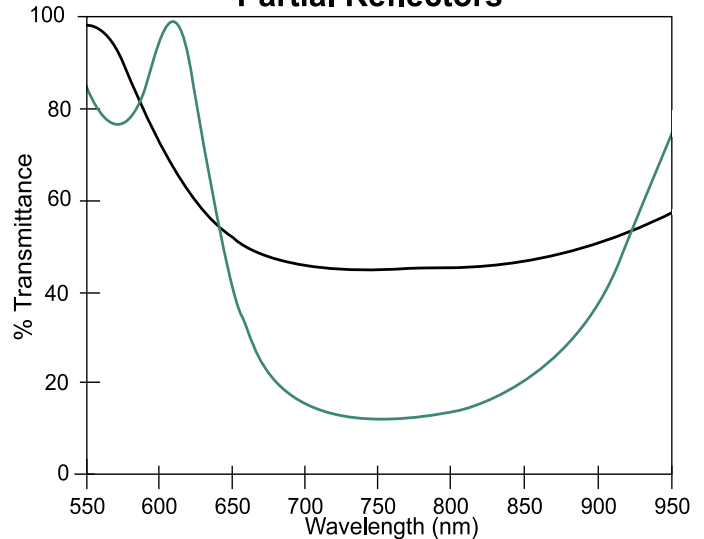
- R < 0.1% per side on any substrate (non standard) Damage threshold > 30 J/ cm², 10 nsec pulse

1 Side	2 Side
10021	10022

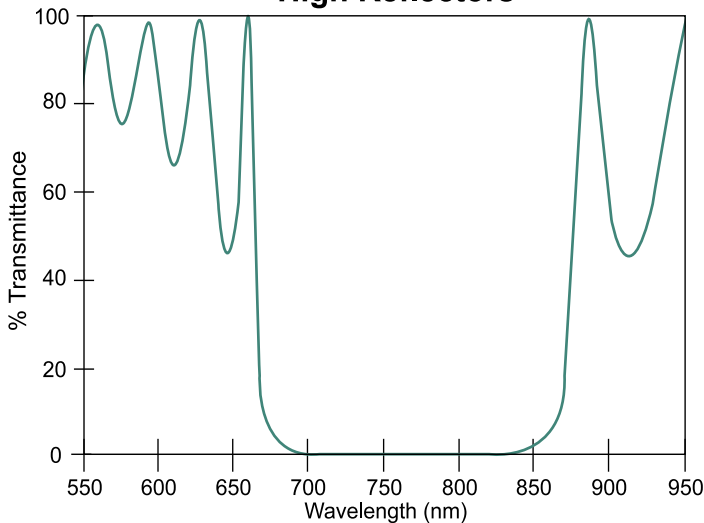
Other reflectances are available as non-standard items. Damage threshold > 30 J/ cm², 10 nsec pulse

Standard R (%)	Part number
90 ± 1	10003
80 ± 2	10004
70 ± 2	10005
60 ± 2.5	10006
50 ± 2.5	10007
40 ± 2.5	10008
30 ± 2	10009
20 ± 2	10010
10 ± 1	10011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

$R_R > 99.5\%$, $R_P > 99.25\%$ and $R_S > 99.75\%$
Damage threshold > 30 J/ cm², 10 nsec pulse.

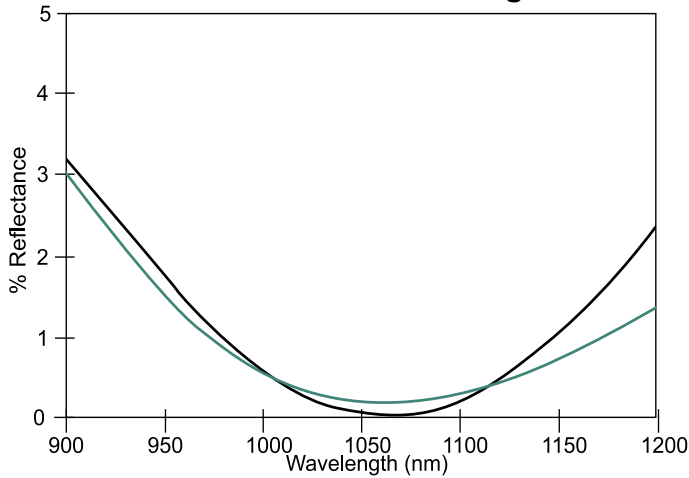
HR at 0°	HR at 45°	Pol.
	10112	R
10012	10113	S
	10114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Nd:YLF Coatings (1047nm)



Antireflection Coatings



Standard:

- $R < 0.25\%$ per side
- Damage threshold $> 15 \text{ J/cm}^2$, 10 nsec pulse.

1 Side	2 Side
11001	11002

Ultra-low reflection (ULR):

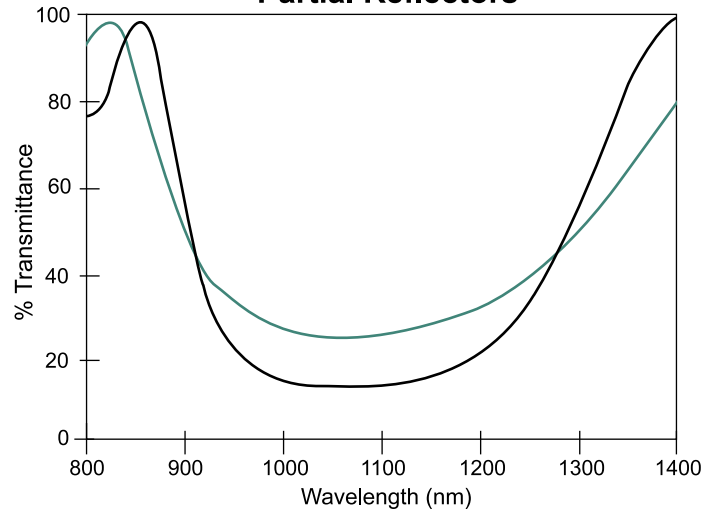
- $R < 0.1\%$ per side on any substrate (non standard) Damage threshold $> 35 \text{ J/cm}^2$, 10 nsec pulse

1 Side	2 Side
11021	11022

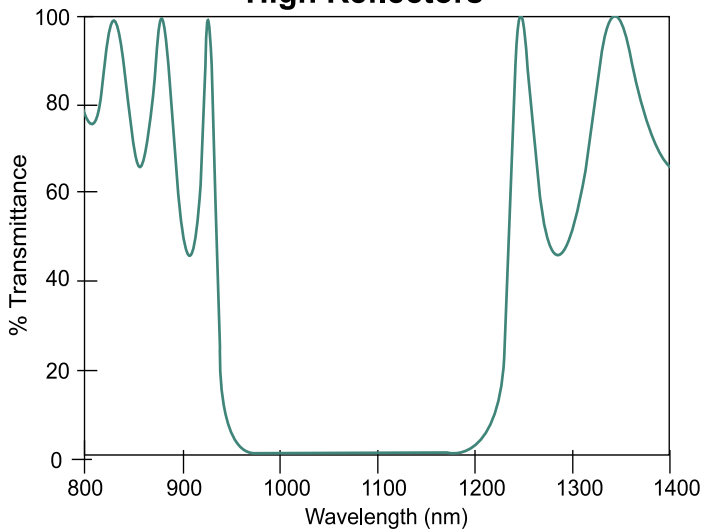
Other reflectances are available as non-standard items. Damage threshold $> 35 \text{ J/cm}^2$, 10 nsec pulse.

Standard R (%)	Part number
90 ± 1	11003
80 ± 2	11004
70 ± 2	11005
60 ± 2.5	11006
50 ± 2.5	11007
40 ± 2.5	11008
30 ± 2	11009
20 ± 2	11010
10 ± 1	11011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45° , please specify polarization.

$R_R > 99.5\%$, $R_P > 99.25\%$ and $R_S > 99.75\%$
Damage threshold $> 35 \text{ J/cm}^2$, 10 nsec pulse.

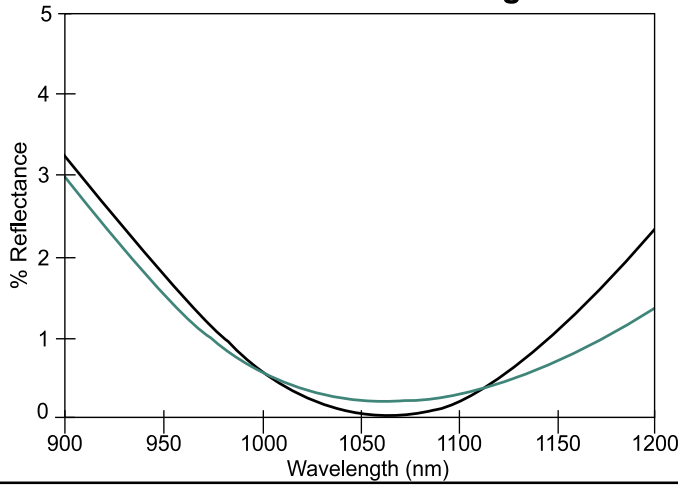
HR at 0°	HR at 45°	Pol.
	11114	R
11012	11115	S
	11116	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Nd:YAG Coatings (1064nm)



Antireflection Coatings



Standard:

- $R < 0.25\%$ per side
- Damage threshold $> 15 \text{ J/cm}^2$, 10 nsec pulse.

1 Side	2 Side
12001	12002

Ultra-low reflection (ULR):

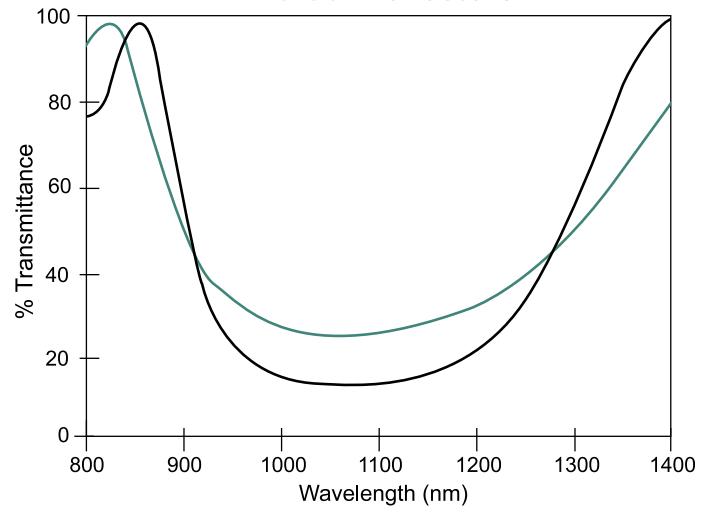
- $R < 0.1\%$ per side on any substrate (non standard)
- Damage threshold $> 35 \text{ J/cm}^2$, 10 nsec pulse

1 Side	2 Side
12021	12022

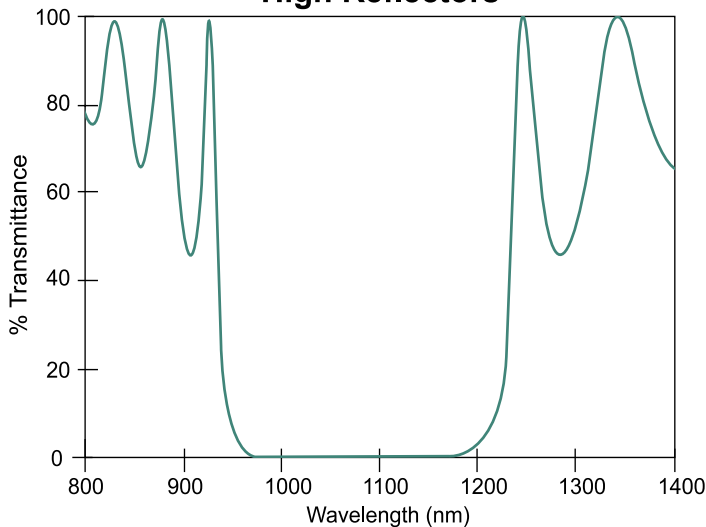
Other reflectances are available as non-standard items. Damage threshold $> 35 \text{ J/cm}^2$, 10 nsec pulse.

Standard R (%)	Part number
90 ± 1	12003
80 ± 2	12004
70 ± 2	12005
60 ± 2.5	12006
50 ± 2.5	12007
40 ± 2.5	12008
30 ± 2	12009
20 ± 2	12010
10 ± 1	12011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45° , please specify polarization.

$R_R > 99.5\%$, $R_P > 99.25\%$ and $R_S > 99.75\%$
Damage threshold $> 35 \text{ J/cm}^2$, 10 nsec pulse.

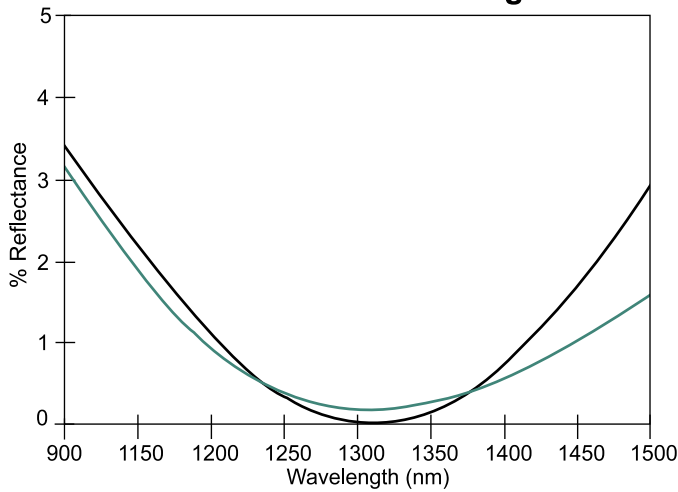
HR at 0°	HR at 45°	Pol.
	12114	R
12012	12115	S
	12116	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Iodine / Diode Coatings (1310-1315nm)



Antireflection Coatings



Standard:

— R < 0.25% per side

1 Side	2 Side
13001	13002

Ultra-low reflection (ULR):

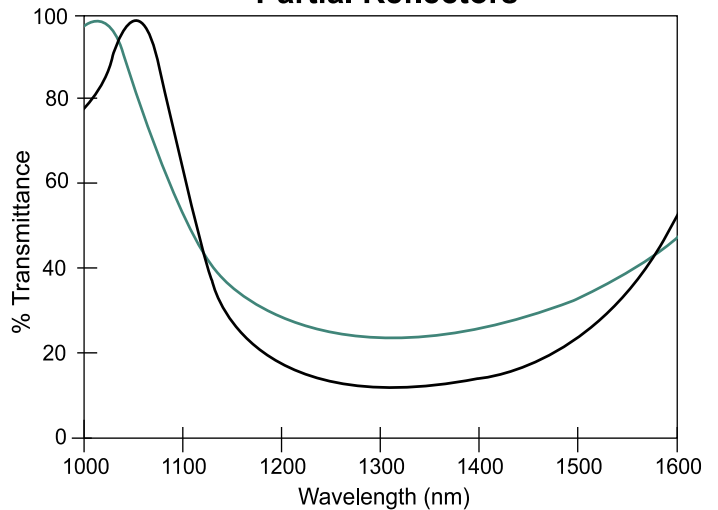
— R < 0.1% per side on any substrate (non standard)

1 Side	2 Side
13021	13022

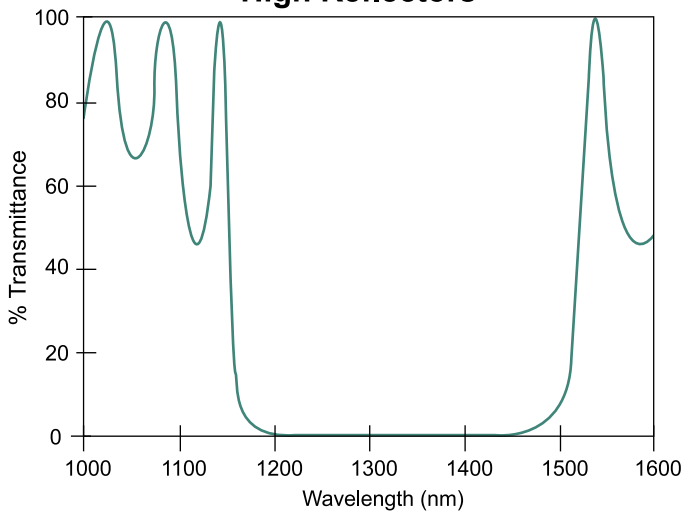
Other reflectances are available as non-standard items.

Standard R (%)	Part number
90 ± 1	13003
80 ± 2	13004
70 ± 2	13005
60 ± 2.5	13006
50 ± 2.5	13007
40 ± 2.5	13008
30 ± 2	13009
20 ± 2	13010
10 ± 1	13011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

$R_R > 99.5\%$, $R_P > 99.25\%$ and $R_S > 99.75\%$

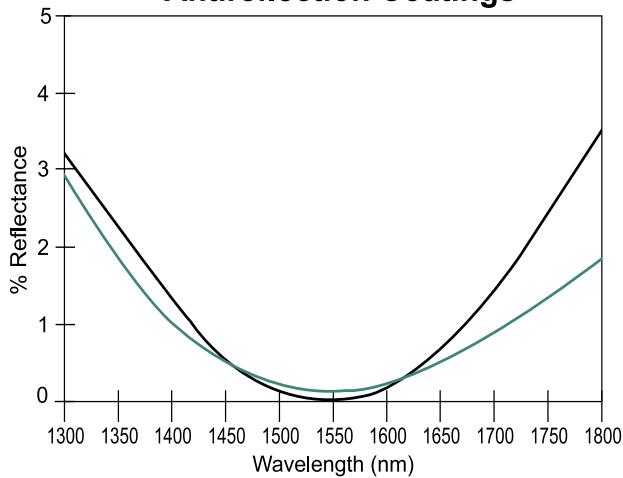
HR at 0°	HR at 45°	Pol.
	13112	R
13012	13113	S
	13114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Nd/Er Glass Coatings (1530-1550nm)



Antireflection Coatings



Standard:

— R < 0.25% per side
Damage threshold 500mw/cm²

1 Side	2 Side
14001	14002

Ultra-low reflection (ULR):

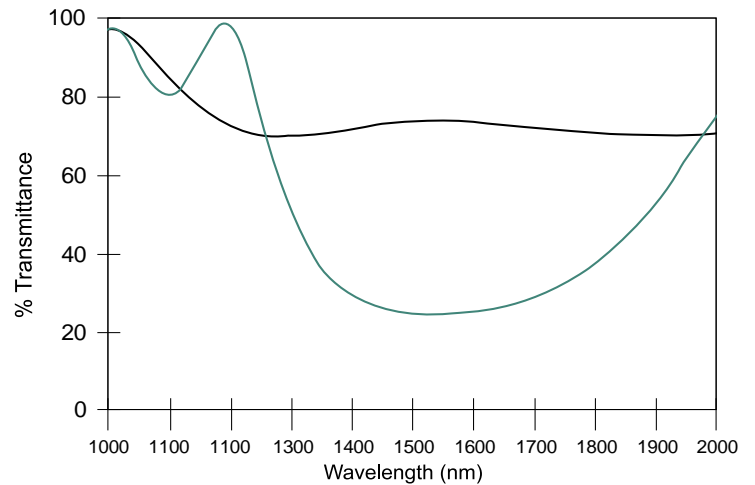
— R < 0.1% per side on any substrate (non standard) Damage threshold 1 gw/cm²

1 Side	2 Side
14021	14022

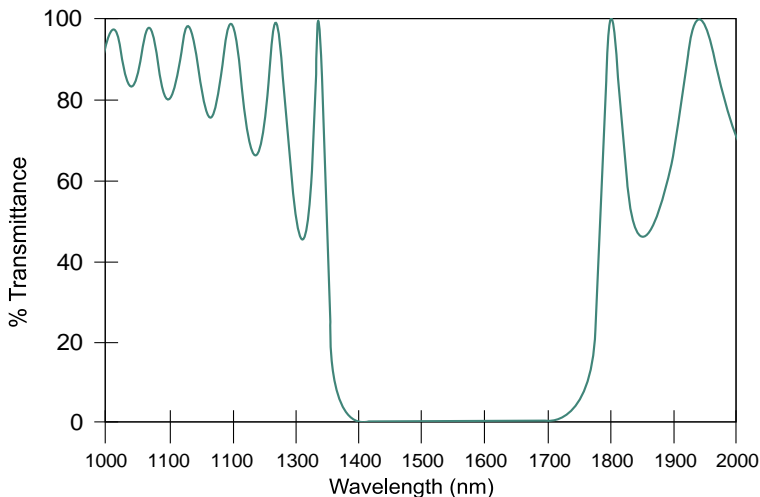
Other reflectances are available as non-standard items. Damage threshold 1gw/cm²

Standard R (%)	Part number
90 ± 1	14003
80 ± 2	14004
70 ± 2	14005
60 ± 2.5	14006
50 ± 2.5	14007
40 ± 2.5	14008
30 ± 2	14009
20 ± 2	14010
10 ± 1	14011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization. Damage threshold 1 gw/cm²

$R_R > 99.5\%$, $R_P > 99.25\%$ and $R_S > 99.75\%$

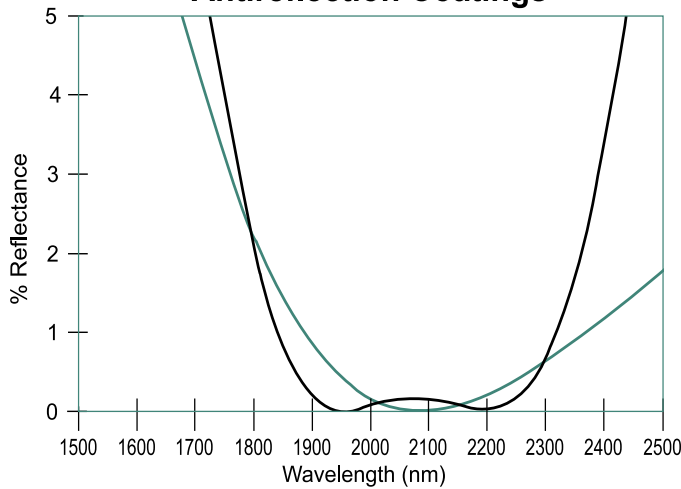
HR at 0°	HR at 45°	Pol.
	14112	R
14012	14113	S
	14114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

CTH:YAG Coatings (2010-2100nm)



Antireflection Coatings



Ultra-low reflection (ULR):

— R < 0.25% per side
Damage threshold > 30 J/ cm², 10 nsec pulse

1 Side 2 Side
15001 15002

Broad Band:

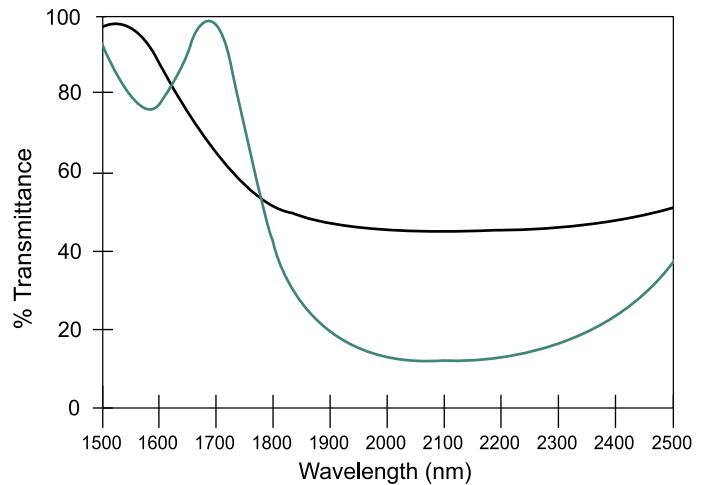
— BBAR < 0.25% average per side on any substrate (non standard) Damage threshold > 30 J/ cm², 10 nsec pulse

1 Side 2 Side
15021 15022

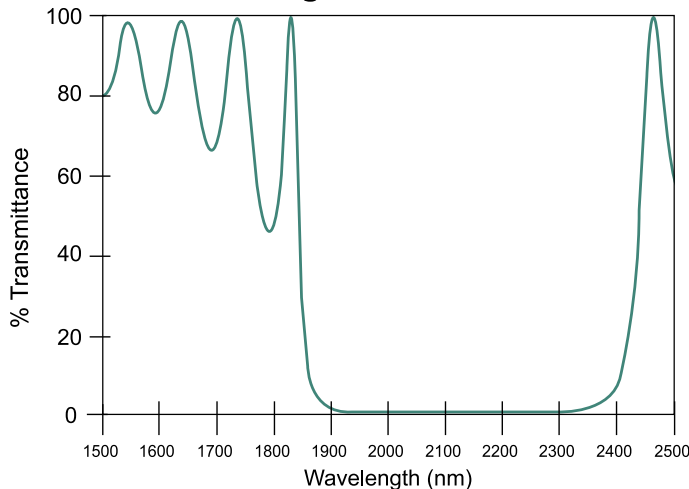
Other reflectances are available as non-standard items. Damage threshold > 30 J/ cm², 10 nsec pulse

Standard R (%)	Part number
90 ± 1	15003
80 ± 2	15004
70 ± 2	15005
60 ± 2.5	15006
50 ± 2.5	15007
40 ± 2.5	15008
30 ± 2	15009
20 ± 2	15010
10 ± 1	15011

Partial Reflectors



High Reflectors



HR coatings: Standard parts are available at 0° and 45°, please specify polarization.

$R_R > 99.5\%$, $R_p > 99.25\%$ and $R_s > 99.75\%$
Damage threshold > 30 J/ cm², 10 nsec pulse

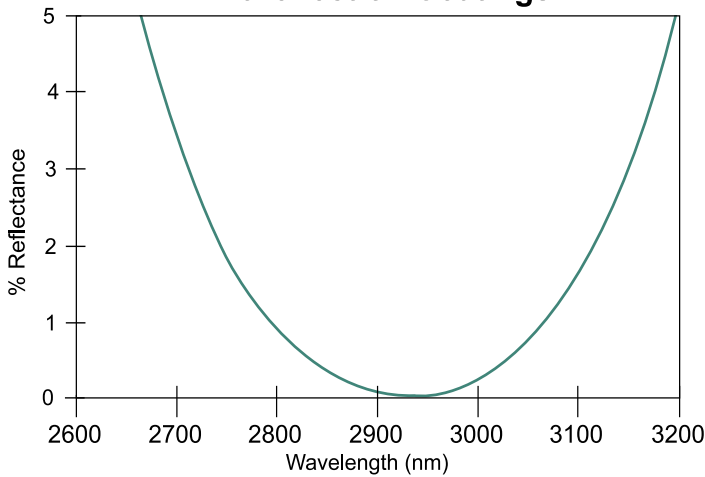
HR at 0°	HR at 45°	Pol.
	15112	R
15012	15113	S
	15114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Er:YAG Coatings (2940nm)



Antireflection Coatings



Standard:

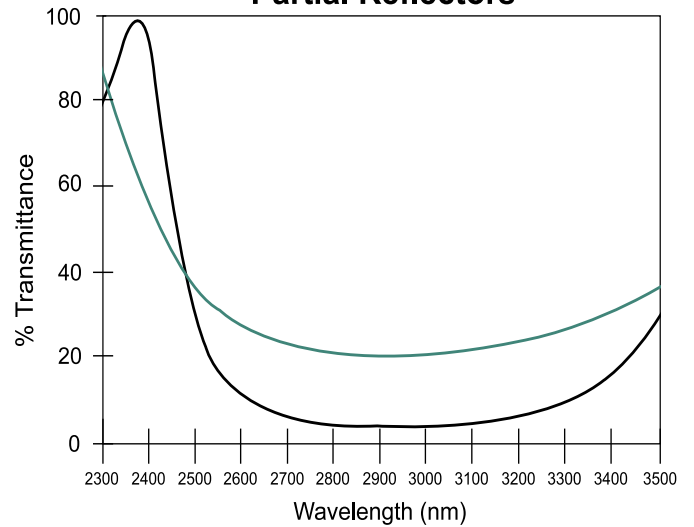
$R < 0.25\%$ per side

1 Side	2 Side
16001	16002

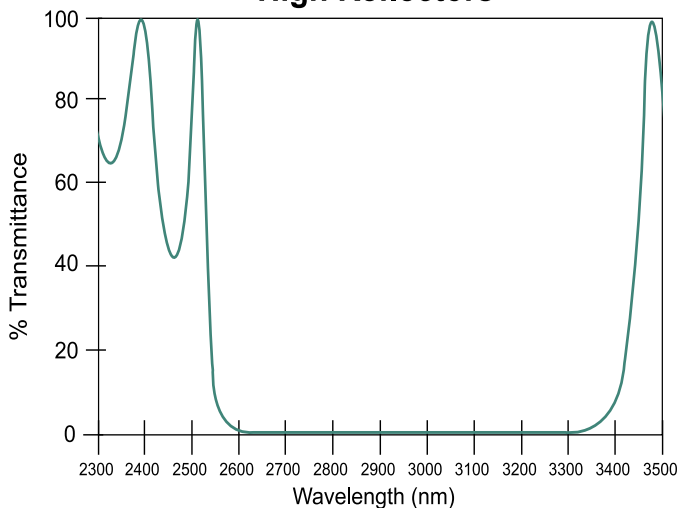
Other reflectances are available as non-standard items.

Standard R (%)	Part number
90 ± 1	16003
80 ± 2	16004
70 ± 2	16005
60 ± 2.5	16006
50 ± 2.5	16007
40 ± 2.5	16008
30 ± 2	16009
20 ± 2	16010
10 ± 1	16011

Partial Reflectors



High Reflectors



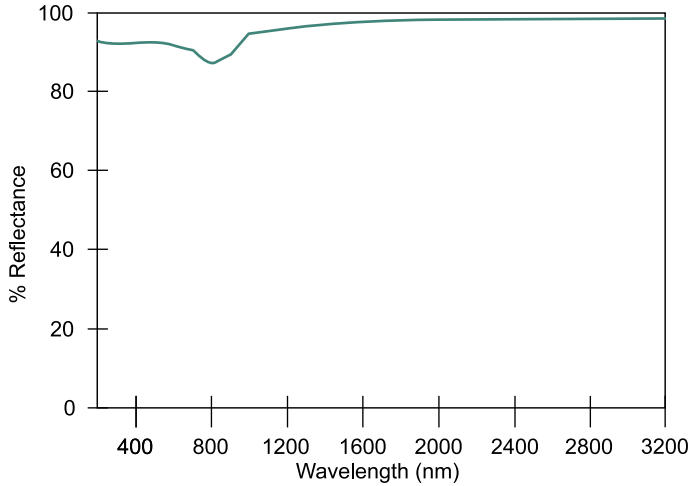
HR coatings: Standard parts are available at 0° and 45° , please specify polarization.

$R_R > 99\%$, $R_P > 98.5\%$ and $R_S > 99.5\%$

HR at 0°	HR at 45°	Pol.
	16112	R
16012	16113	S
	16114	P

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Metal Coatings (250-3200nm & Higher)



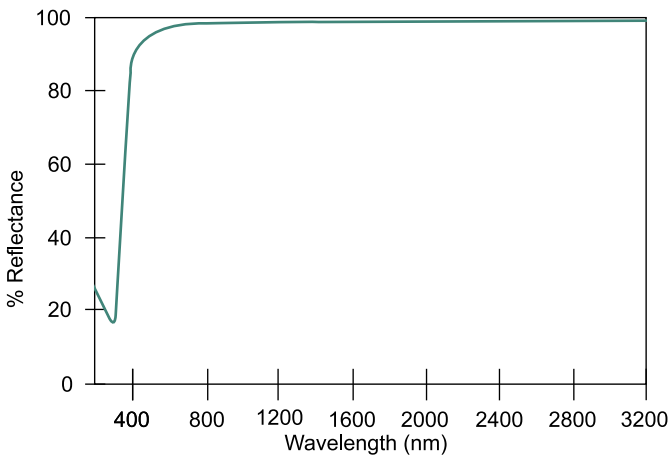
Aluminum Coatings

Aluminum can provide reflectance values > 90% from 220 nm to 10 nm.

Protected Aluminum coatings are available, which are more durable yet still provide acceptable reflectance.

Part number

M1000



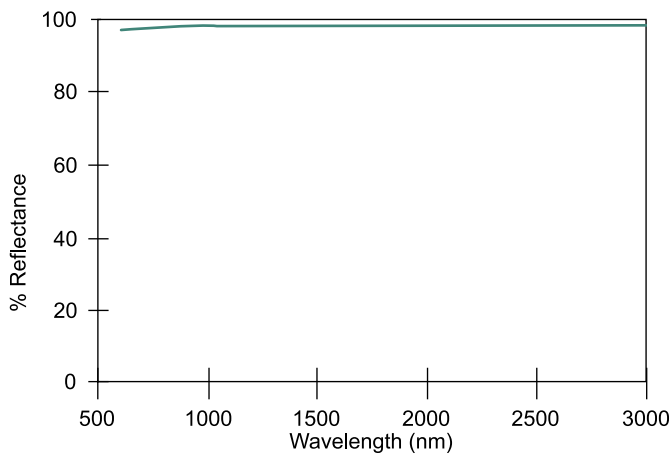
Silver Coatings

Silver films provide the highest reflectivity in the visible and in the infrared region values, > 98% from 250 nm to 8 nm.

Protected silver coatings are available to achieve better durability.

Part number

M2000



Gold Coatings

Gold films have highest reflectivity in the infrared region values > 98% beyond 1 nm.

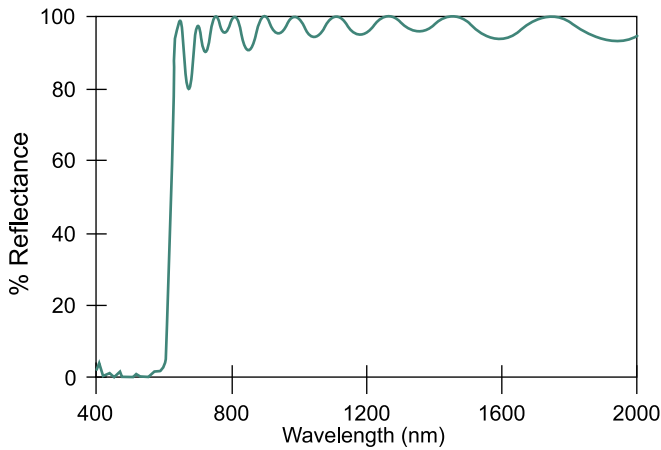
Protected gold coatings are available allowing easier cleaning and achieve better durability.

Part number

M3000

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Dichroic Filter (250-3200nm & Higher)

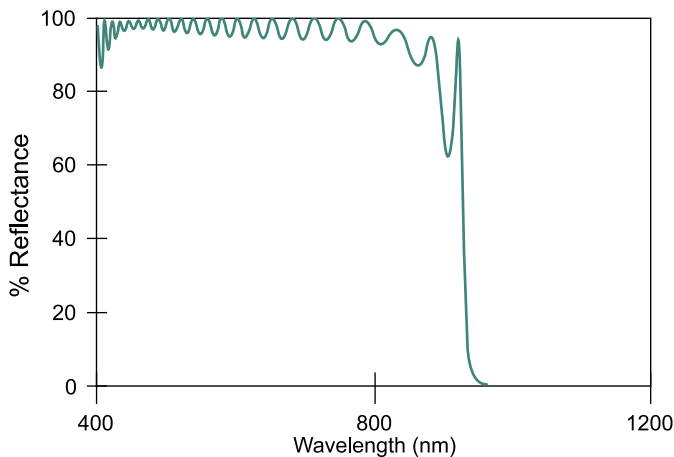


Long Pass Filter

Long pass filters are available in two configurations, 0° and 45°

Part number	0°	45°
LP-XXXX	-1	-2

See example at bottom of page.



Short Pass Filter

Long pass filters are available in two configurations, 0° and 45°

Part number	0°	45°
SP-XXXX	-1	-2

See example at bottom of page.

Dichroic Filters are normally specified by the cut on or cut off wavelength. This is the wavelength where the transmission of the filter is equal to 50%.

To specify a short pass filter with a cut off wavelength of 700nm at 45° AOI. The part number would be as follows:

SP-0700-2

These coatings are available from stock on our standard substrates (see page 27-28 & 33-36). For other substrates or custom coating specifications please call TwinStar.

Nd:YAG Laser Slabs

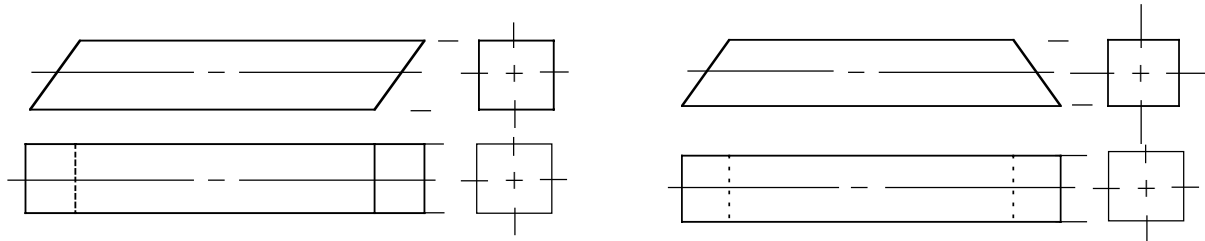


Specifications:

- Flatness 1/10 @ 632.8nm (Dia. Cross Sect.)
- Surface Quality 10/5 or better
- Parallelism Less than 10 seconds
- Perpendicularity Less than 5 minutes
- Length Less than 6 inches
- End Configuration Flat, angled, or Brewster
- Clear Aperature Central 95%

TwinStar specializes in the manufacturing and repolishing of custom laser slabs per customer specifications. Call our sales department for a price quote and delivery.

1.1% Nd concentration available

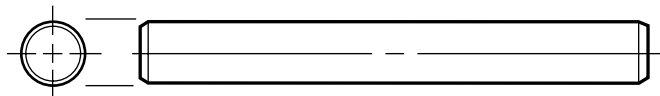


Replacement Nd:YAG Laser Rods

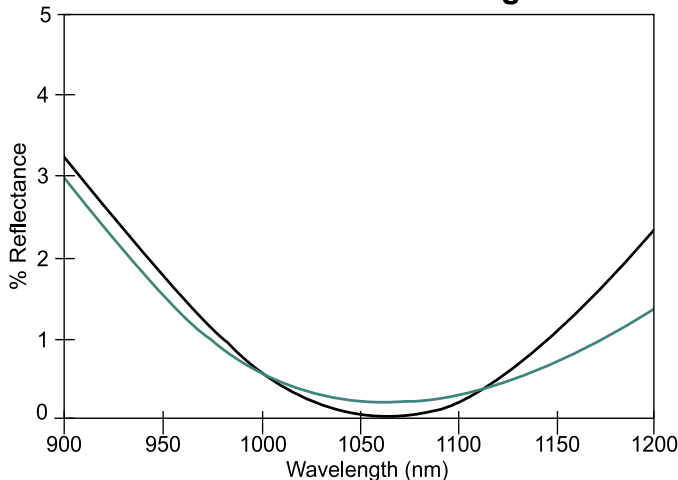


Specifications:

- Flatness 1/10 @ 632.8nm
- Surface Quality 10/5 or better
- Parallelism Less than 10 seconds
- Perpendicularity Less than 5 minutes
- Clear Aperature Central 95%



Antireflection Coatings



Standard:

- R < 0.25% per side
- Damage threshold > 20 J/ cm², 10 nsec pulse.

Both Sides
11001

Ultra-low reflection (ULR):

- R < 0.1% per side on any substrate (non standard)
- Damage threshold > 35 J/ cm², 10 nsec pulse

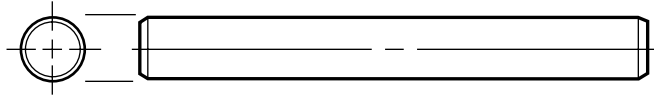
Both Sides
11021

Nd:YAG Rod Repolishing & (Er:YAG & CTH:YAG)



Specifications:

Flatness 1/10 @ 632.8nm
 Surface Quality 10/5 or better
 Parallelism Less than 10 seconds
 Perpendicularity Less than 5 minutes
 Clear Aperture Central 95%



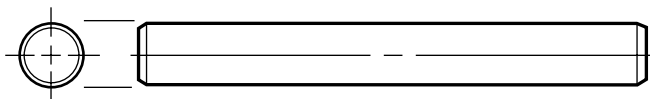
	Flat & Parallel	Radius	Tilt	Brewster/Brewster
Diameter				
2.00 mm (.078")	YF02	YR02	YT02	YB02
3.00 mm (.118")	YF03	YR03	YT03	YB03
4.00 mm (.157")	YF04	YR04	YT04	YB04
5.00 mm (.197")	YF05	YR05	YT05	YB05
6.00 mm (.234")	YF23	YR23	YT23	YB23
6.35 mm (.250")	YF25	YR25	YT25	YB25
7.00 mm (.275")	YF26	YR26	YT26	YB26
8.50 mm (.345")	YF33	YR33	YT33	YB33
9.00 mm (.345")	YF35	YR35	YT35	YB35
9.52 mm (.375")	YF37	YR37	YT37	YB37
10.0 mm (.394")	YF39	YR39	YT39	YB39

Nd: Glass Rod Repolishing



Specifications:

Flatness 1/8 @ 632.8nm
 Surface Quality 10/5 or better
 Parallelism Less than 10 seconds
 Perpendicularity Less than 5 minutes
 Clear Aperture Central 95%



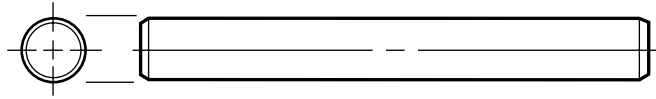
Flat & Parallel		Tilt
Diameter		
6.35 mm (.250")	NF25	NT25
9.52 mm (.375")	NF37	NT37
12.7 mm (.500")	NF50	NT50
19.5 mm (.750")	NF75	NT75
25.4 mm (1.00")	NF10	NT10
38.1 mm (1.50")	NF15	NT15
50.8 mm (2.00")	NF20	NT20

Nd:YLF Rod Repolishing



Specifications:

Flatness 1/8 @ 632.8nm
 Surface Quality 10/5 or better
 Parallelism Less than 10 seconds
 Perpendicularity Less than 5 minutes
 Clear Aperature Central 95%



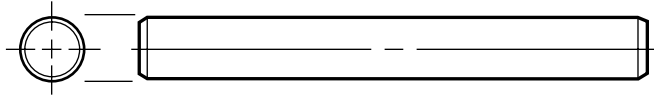
	Flat & Parallel	Radius	Tilt	Brewster/Brewster
Diameter				
1.50 mm (.059")	NYF06	NYR06	NYT06	NYB06
2.00 mm (.078")	NYF02	NYR02	NYT02	NYB02
3.00 mm (.118")	NYF03	NYR03	NYT03	NYB03
4.00 mm (.157")	NYF04	NYR04	NYT04	NYB04
5.00 mm (.197")	NYF05	NYR05	NYT05	NYB05
6.35 mm (.250")	NYF25	NYR25	NYT25	NYB25

RUBY Rod Repolishing



Specifications:

Flatness 1/8 @ 632.8nm
 Surface Quality 10/5 or better
 Parallelism Less than 10 seconds
 Perpendicularity Less than 5 minutes
 Clear Aperature Central 95%



	Flat & Parallel	Brewster/Brewster
Diameter		
4.00 mm (.157") 5.00 mm (.197")	RF04 RF05	RB04 RB05
6.35 mm (.250") 9.52 mm (.375")	RF25 RF37	RB25 RB37
12.7 mm (.500") 19.0 mm (.750")	RF50 RF75	RB50 RB75



TwinStar will also polish & coat the following laser crystals per customer specifications:

Nd:YVO₄
Cr:LiSAF
Cr:LiSGaF
Cr:LiCAF
KNbO₃
Ti:Sapphire
Lithium Niobate
Fluoride Crystals

Call our sales department for a
price quote & delivery.

