FemtoLine Laser Optics

LASER MIRRORS

Laser mirrors for femtosecond applications are designed to have a broad operating wavelength range and linear phase versus frequency characteristics (group delay dispersion (GDD)). The coating is a single layer dielectric and has no phase shift over the operating wavelength region. High reflectivity mirrors always have higher reflection, broader operating region and lower pulse distortion for s-polarization than for p-polarization for the same dielectric coating. If possible use the mirrors with s-polarized beam.

Our standard mirrors are suitable for fundamental Ti:Sapphire and Yb:KGW or KYW lasers and their doubled, tripled or quadrupled frequencies.

SUBSTRATE

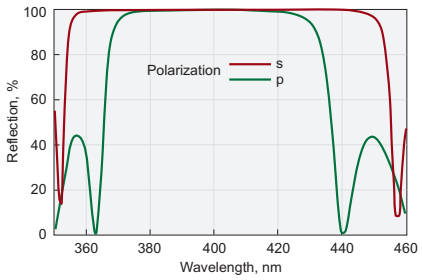
Material	UV grade Fused Silica or BK7 glass
S1 Surface Flatness	λ/10 at 633 nm
S1 Surface Quality	20–10 scratch & dig (MIL-PRF-13830B)
S2 Surface Quality	Commercial polish
Diameter Tolerance	+0.00 mm -0.12 mm
Thickness Tolerance	±0.25 mm
Wedge	< 3 min
Chamfer	0.3 mm at 45° typical

COATING

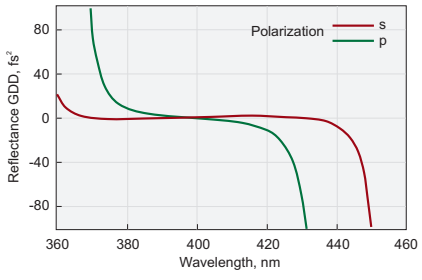
Technology	Electron beam multilayer dielectric or Ion beam sputtering
Adhesion and Durability	Per MIL-C-675A. Insoluble in lab solvents
Clear Aperture	Exceeds central 85% of diameter
Coating	Hard dielectric High Reflection R>99.5%
Angle of Incidence	0 or 45±3°
Designed for average polarization	R=(Rs+Rp)/2
Laser Damage Threshold	>100 mJ/cm², 50 fsec pulse, 50 Hz, 800 nm typical
Coated Surface Flatness	λ/10 at 633 nm over clear aperture

LOW GDD ULTRAFAST MIRRORS

Substrate material: **BK7 grade A**



HR>99.5% @ 380 – 420 nm, AOI=45°



HRsp @ 380 – 420 GDD, AOI=45°

Wavelength, nm	AOI=0°			AOI=45°		
	R, % (s+p)/2	Catalogue number	Price, EUR	R, % (s+p)/2	Catalogue number	Price, EUR
Size – Ø12.7 × 3 mm						
380 – 420	99.7	031-0400-i0	57	99.5	031-0400	57
500 – 530	99.7	031-0515-i0	56	99.5	031-0515	56
760 – 840	99.7	031-0800-i0	61	99.5	031-0800	61
1000 – 1060	99.7	031-1030-i0	57	99.5	031-1030	57
Size – Ø12.7 × 6 mm						
380 – 420	99.7	031-0400T6-i0	57	99.5	031-0400T6	57
500 – 530	99.7	031-0515T6-i0	56	99.5	031-0515T6	56
760 – 840	99.7	031-0800T6-i0	61	99.5	031-0800T6	61
1000 – 1060	99.7	031-1030T6-i0	57	99.5	031-1030T6	57
Size – Ø25.4 × 6 mm						
380 – 420	99.7	032-0400-i0	89	99.5	032-0400	89
500 – 530	99.7	032-0515-i0	74	99.5	032-0515	74
760 – 840	99.7	032-0800-i0	85	99.5	032-0800	85
1000 – 1060	99.7	032-1030-i0	75	99.5	032-1030	75
Size – Ø50.8 × 8 mm						
380 – 420	99.7	035-0400-i0	133	99.5	035-0400	133
500 – 530	99.7	035-0515-i0	110	99.5	035-0515	110
760 – 840	99.7	035-0800-i0	133	99.5	035-0800	133
1000 – 1060	99.7	035-1030-i0	110	99.5	035-1030	110
Size – Ø76.2 × 12.7 mm						
380 – 420	99.7	037-0400-i0	199	99.5	037-0400	199
500 – 530	99.7	037-0515-i0	185	99.5	037-0515	185
760 – 840	99.7	037-0800-i0	199	99.5	037-0800	199
1000 – 1060	99.7	037-1030-i0	185	99.5	037-1030	185

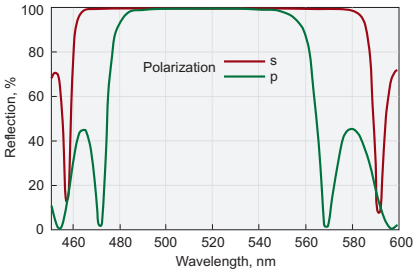
RELATED PRODUCTS

Adapter for Mirror at 45° 840-0115

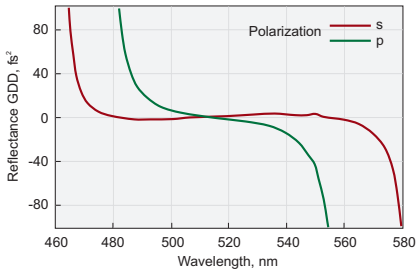
LOW GDD ULTRAFAST MIRRORS

Substrate material: **UV grade Fused Silica**

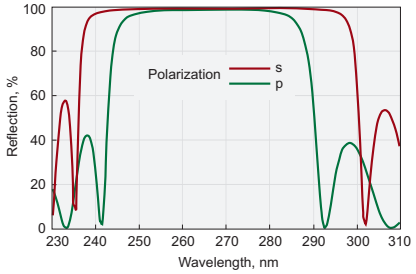
Recommended for high power laser applications operating in UV region.



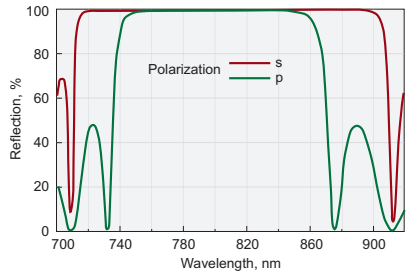
HR>99.5% @ 500-530 nm, AOI=45°



HRsp @ 500-530 GDD, AOI=45°

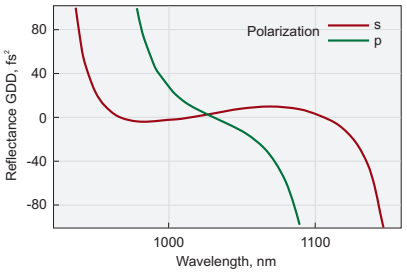


HR>99% @ 257-275 nm, AOI=45°

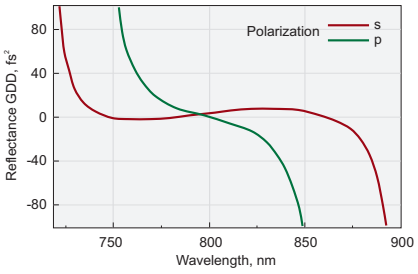


HR>99.5% @ 760-840 nm, AOI=45°

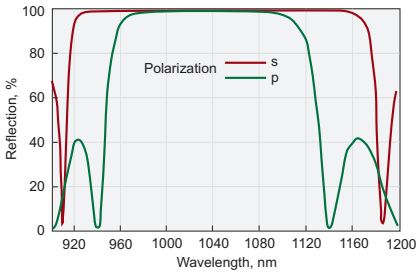
Wavelength, nm	AOI=0°			AOI=45°		
	R, % (s+p)/2	Catalogue number	Price, EUR	R, % (s+p)/2	Catalogue number	Price, EUR
Size – Ø12.7 × 3 mm						
257 – 275	99.0	041-0266-i0	71	99.0	041-0266	71
333 – 353	99.7	041-0343-i0	77	99.5	041-0343	77
380 – 420	99.7	041-0400-i0	67	99.5	041-0400	67
500 – 530	99.7	041-0515-i0	62	99.5	041-0515	62
760 – 840	99.7	041-0800-i0	75	99.5	041-0800	75
1000 – 1060	99.7	041-1030-i0	62	99.5	041-1030	62
Size – Ø12.7 × 6 mm						
257 – 275	99.0	041-0266T6-i0	71	99.0	041-0266T6	71
333 – 353	99.7	041-0343T6-i0	77	99.5	041-0343T6	77
380 – 420	99.7	041-0400T6-i0	67	99.5	041-0400T6	67
500 – 530	99.7	041-0515T6-i0	62	99.5	041-0515T6	62
	99.9	041-0515T6HHR-i0	75	99.9	041-0515T6HHR	75
760 – 840	99.7	041-0800T6-i0	75	99.5	041-0800T6	75
	99.9	041-0800T6HHR-i0	108	99.9	041-0800T6HHR	108
1000 – 1060	99.7	041-1030T6-i0	62	99.5	041-1030T6	62
	99.9	041-1030T6HHR-i0	75	99.9	041-1030T6HHR	75
Size – Ø25.4 × 6 mm						
257 – 275	99.0	042-0266-i0	99	99.0	042-0266	99
333 – 353	99.7	042-0343-i0	107	99.5	042-0343	107
380 – 420	99.7	042-0400-i0	95	99.5	042-0400	95
500 – 530	99.7	042-0515-i0	90	99.5	042-0515	90
	99.9	042-0515HHR-i0	105	99.9	042-0515HHR	105
760 – 840	99.7	042-0800-i0	97	99.5	042-0800	97
	99.9	042-0800HHR-i0	130	99.9	042-0800HHR	130
1000 – 1060	99.7	042-1030-i0	90	99.5	042-1030	90
	99.9	042-1030HHR-i0	105	99.9	042-1030HHR	105
1400 – 1700	99.0	082-1417-i0	210	99.0	082-1417	210
1900 – 2120	99.8	082-1921-i0	210	99.8	082-1921	210
Size – Ø50.8 × 8 mm						
257 – 275	99.0	045-0266-i0	207	99.0	045-0266	207
333 – 353	99.7	045-0343-i0	187	99.5	045-0343	187
380 – 420	99.7	045-0400-i0	181	99.5	045-0400	181
500 – 530	99.7	045-0515-i0	169	99.5	045-0515	169
760 – 840	99.7	045-0800-i0	181	99.5	045-0800	181
1000 – 1060	99.7	045-1030-i0	169	99.5	045-1030	169
Size – Ø76.2 × 12.7 mm						
257 – 275	99.0	047-0266-i0	290	99.0	047-0266	290
333 – 353	99.7	047-0343-i0	281	99.5	047-0343	281
380 – 420	99.7	047-0400-i0	272	99.5	047-0400	272
500 – 530	99.7	047-0515-i0	258	99.5	047-0515	258
760 – 840	99.7	047-0800-i0	272	99.5	047-0800	272
1000 – 1060	99.7	047-1030-i0	258	99.5	047-1030	258



HRsp @ 1000-1060 GDD, AOI=45°



HRsp @ 760-840 GDD, AOI=45°



HR>99.5% @ 1000-1060 nm, AOI=45°

DUAL BAND MIRRORS

SPECIFICATIONS

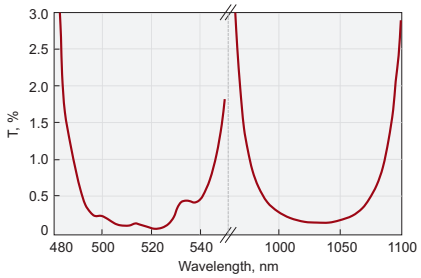
Coating	Hard dielectric High Reflection R>99.5%
Angle of Incidence	0 or 45±3°
Designed for average polarization	R=(Rs+Rp)/2
Laser Damage Threshold	>50 mJ/cm², 50 fsec pulse, 800 nm typical

SUBSTRATE

Material	UV grade Fused Silica or BK7 glas
S1 Surface Flatness	λ/10 at 633 nm
S1 Surface Quality	20 –10 scratch & dig (MIL-PRF-13830B)
S2 Surface Quality	Commercial polish
Diameter Tolerance	+0.00 mm; -0.12 mm
Thickness Tolerance	±0.25 mm
Wedge	< 3 min
Chamfer	0.3 mm at 45° typical

DUAL BAND MIRRORS

Substrate material: **BK7 grade A**



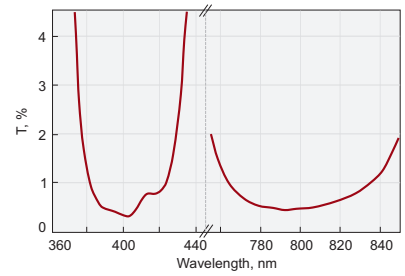
HR>99.5% @ 500-530 nm + 1000-1060 nm, AOI = 45°

Wavelength, nm	AOI=0°			AOI=45°		
	R, % (s+p)/2	Catalogue number	Price, EUR	R, % (s+p)/2	Catalogue number	Price, EUR
Size – Ø12.7 × 3 mm						
390-410 + 780-820	99.7	**051-4080-i0**	85	99.5	**051-4080**	85
500-530 + 1000-1060	99.7	**051-5103-i0**	85	99.5	**051-5103**	85
Size – Ø12.7 × 6 mm						
390-410 + 780-820	99.7	**051-4080T6-i0**	85	99.5	**051-4080T6**	85
500-530 + 1000-1060	99.7	**051-5103T6-i0**	85	99.5	**051-5103T6**	85
Size – Ø25.4 × 6 mm						
390-410 + 780-820	99.7	**052-4080-i0**	103	99.5	**052-4080**	103
500-530 + 1000-1060	99.7	**052-5103-i0**	103	99.5	**052-5103**	103
Size – Ø50.8 × 8 mm						
390-410 + 780-820	99.7	**055-4080-i0**	151	99.5	**055-4080**	151
500-530 + 1000-1060	99.7	**055-5103-i0**	151	99.5	**055-5103**	151
Size – Ø76.2 × 12.7 mm						
390-410 + 780-820	99.7	**057-4080-i0**	227	99.5	**057-4080**	227
500-530 + 1000-1060	99.7	**057-5103-i0**	227	99.5	**057-5103**	227

DUAL BAND MIRRORS

Substrate material: **UV grade Fused Silica**

Recommended for high power laser applications operating in UV region.



HR>99% @ 400 nm + 800 nm, AOI = 45°

Wavelength, nm	AOI=0°			AOI=45°		
	R, % (s+p)/2	Catalogue number	Price, EUR	R, % (s+p)/2	Catalogue number	Price, EUR
Size – Ø12.7 × 3 mm						
390-410 + 780-820	99.7	**061-4080-i0**	110	99.5	**061-4080**	110
500-530 + 1000-1060	99.7	**061-5103-i0**	110	99.5	**061-5103**	110
Size – Ø12.7 × 6 mm						
390-410 + 780-820	99.7	**061-4080T6-i0**	110	99.5	**061-4080T6**	110
500-530 + 1000-1060	99.7	**061-5103T6-i0**	110	99.5	**061-5103T6**	110
Size – Ø25.4 × 6 mm						
390-410 + 780-820	99.7	**062-4080-i0**	128	99.5	**062-4080**	128
500-530 + 1000-1060	99.7	**062-5103-i0**	128	99.5	**062-5103**	128
Size – Ø50.8 × 8 mm						
390-410 + 780-820	99.7	**065-4080-i0**	214	99.5	**065-4080**	214
500-530 + 1000-1060	99.7	**065-5103-i0**	214	99.5	**065-5103**	214
Size – Ø76.2 × 12.7 mm						
390-410 + 780-820	99.7	**067-4080-i0**	321	99.5	**067-4080**	321
500-530 + 1000-1060	99.7	**067-5103-i0**	321	99.5	**067-5103**	321

BROADBAND LOW GDD ULTRAFAST MIRRORS

FEATURES

- High reflectivity and low group delay dispersion in broad region centered at 800 nm
- Rs > 99% @ 700 – 930 nm, |GDDs| < 30 fs² @ 700 – 930 nm
- Rp > 99% @ 730 – 870 nm, |GDDp| < 30 fs² @ 730 – 870 nm
- R > 99% @ 720 – 880 nm, |GDD| < 30 fs² @ 720 – 880 nm

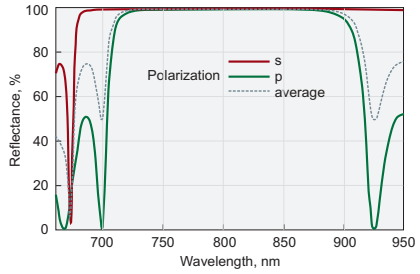
SPECIFICATIONS

Coating	Hard Dielectric High Reflection or Ion Beam Sputtering
Angle of Incidence	0 or 45±3°
Designed for average polarization	R=(Rs+Rp)/2
Laser Damage Threshold	>50 mJ/cm², 50 fsec pulse, 800 nm typical

SUBSTRATE

Material	UV grade Fused Silica or BK7 glas
S1 Surface Flatness	λ/10 at 633 nm
S1 Surface Quality	20 –10 scratch & dig (MIL-PRF-13830B)
S2 Surface Quality	Commercial polish
Diameter Tolerance	+0.00 mm; -0.12 mm
Thickness Tolerance	±0.25 mm
Wedge	< 3 min
Chamfer	0.3 mm at 45° typical

BROADBAND LOW GDD ULTRAFAST MIRRORS



HR>99% @ 720-880 nm, AOI=45°

Wavelength, nm	Diameter, mm	Thickness, mm	AOI = 0°			AOI = 45°		
			R, % (s+p)/2	Catalogue number	Price, EUR	R, % (s+p)/2	Catalogue number	Price, EUR
Substrate material: **BK7 grade A**								
720-880	12.7	3.0	99.0	**071-7288-i0**	86	99.0	**071-7288**	86
720-880	12.7	6.0	99.0	**071-7288T6-i0**	86	99.0	**071-7288T6**	86
720-880	25.4	6.0	99.0	**072-7288-i0**	104	99.0	**072-7288**	104
720-880	38.1	8.0	99.0	**074-7288-i0**	195	99.0	**074-7288**	195
720-880	50.8	8.0	99.0	**075-7288-i0**	220	99.0	**075-7288**	220
720-880	76.2	12.7	99.0	**077-7288-i0**	395	99.0	**077-7288**	395
720-880	101.6	15.0	99.0	**078-7288-i0**	540	99.0	**078-7288**	540
Substrate material: **UV grade Fused Silica**								
720-880	12.7	3.0	99.0	**081-7288-i0**	111	99.0	**081-7288**	111
720-880	12.7	6.0	99.0	**081-7288T6-i0**	111	99.0	**081-7288T6**	111
720-880	25.4	6.0	99.0	**082-7288-i0**	129	99.0	**082-7288**	129
720-880	25.4	6.0	99.9	**082-7288HHR-i0**	145	99.8	**082-7288HHR**	145
720-880	38.1	8.0	99.0	**084-7288-i0**	225	99.0	**084-7288**	225
720-880	50.8	8.0	99.0	**085-7288-i0**	255	99.0	**085-7288**	255
720-880	76.2	12.7	99.0	**087-7288-i0**	460	99.0	**087-7288**	460
720-880	101.6	15.0	99.0	**088-7288-i0**	612	99.0	**088-7288**	612

RELATED PRODUCTS

Metallic Coated Mirrors
See page 1.26

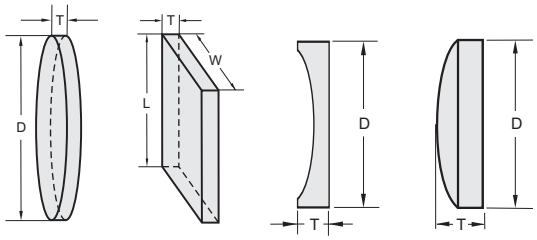
Kinematic Mirror / Beamsplitter Mounts 840-0056

ENHANCED SILVER MIRRORS

FEATURES

- LIDT – 0.25 J/cm² at 800 nm, 50 Hz, 94 fsec pulses
- Round, square, flat or spherical mirrors available
- Reflectivity R>98.5% @ 600 – 1100 nm, R>99% @ 700 – 900 nm
- Operating angle of incidence from 0° to 45°
- Group Delay Dispersion < | 5 fs² |

Enhanced silver mirrors are designed for applications with femtosecond lasers. These mirrors feature high reflectivity R>98.5% in the wavelength range from 600 nm to 1100 nm and R>99% @ 700 – 900 nm. Mirrors are relatively insensitive to angle of incidence and can be used in applications with AOI ranging from 0° to 45°.



Drawings of flat round, flat rectangular and spherical mirrors

FLAT RECTANGULAR MIRRORS. Substrate type: plano-plano

Width W, mm	Length L, mm	Thickness T, mm	Substrate material	Catalogue number	Price, EUR
15.0	20.0	6	BK7	091-0325F	55
20.0	30.0	6	BK7	092-0325F	82
25.4	25.4	6	BK7	093-0325F	80
25.4	50.8	10	BK7	094-0325F	115
50.8	50.8	10	BK7	095-0325F	155
15.0	20.0	6	UVFS	091-3325F	70
20.0	30.0	6	UVFS	092-3325F	92
25.4	25.4	6	UVFS	093-3325F	90
25.4	50.8	10	UVFS	094-3325F	135
50.8	50.8	10	UVFS	095-3325F	175

FLAT ROUND MIRRORS. Substrate type: plano-plano

Diameter D, mm	Thickness T, mm	Substrate material	Catalogue number	Price, EUR
Ø12.7	3	BK7	091-0025F	45
Ø12.7	6	BK7	091-0025FT6	45
Ø25.4	6	BK7	092-0025F	75
Ø50.8	8	BK7	095-0025F	145
Ø76.2	12.7	BK7	097-0025F	300
Ø101.6	15	BK7	098-0025F	450
Ø12.7	3	UVFS	091-3025F	56
Ø12.7	6	UVFS	091-3025FT6	56
Ø25.4	6	UVFS	092-3025F	85
Ø50.8	8	UVFS	095-3025F	162
Ø76.2	12.7	UVFS	097-3025F	355
Ø101.6	15	UVFS	098-3025F	530

SPHERICAL MIRRORS. Diameter, D = 12.7 mm.
Thickness (edge for plano-concave, center for plano-convex), T = 6.0 mm

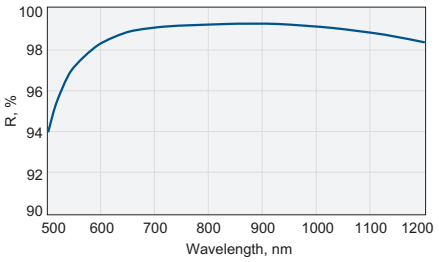
Radius, mm	Substrate type	Substrate material	Catalogue number	Price, EUR
-50	Plano-concave	BK7	091-0125FR-50	60
-75	Plano-concave	BK7	091-0125FR-75	60
-100	Plano-concave	BK7	091-0125FR-100	60
-150	Plano-concave	BK7	091-0125FR-150	60
-200	Plano-concave	BK7	091-0125FR-200	60
-250	Plano-concave	BK7	091-0125FR-250	60
-300	Plano-concave	BK7	091-0125FR-300	60
-400	Plano-concave	BK7	091-0125FR-400	60
-500	Plano-concave	BK7	091-0125FR-500	60
-1000	Plano-concave	BK7	091-0125FR-1000	60
-1500	Plano-concave	BK7	091-0125FR-1500	60
-2000	Plano-concave	BK7	091-0125FR-2000	60
-50	Plano-concave	UVFS	091-3125FR-50	86
-75	Plano-concave	UVFS	091-3125FR-75	86
-100	Plano-concave	UVFS	091-3125FR-100	86
-150	Plano-concave	UVFS	091-3125FR-150	86
-200	Plano-concave	UVFS	091-3125FR-200	86
-250	Plano-concave	UVFS	091-3125FR-250	86
-300	Plano-concave	UVFS	091-3125FR-300	86
-400	Plano-concave	UVFS	091-3125FR-400	86
-500	Plano-concave	UVFS	091-3125FR-500	86
-1000	Plano-concave	UVFS	091-3125FR-1000	86
-1500	Plano-concave	UVFS	091-3125FR-1500	86
-2000	Plano-concave	UVFS	091-3125FR-2000	86

Radius, mm	Substrate type	Substrate material	Catalogue number	Price, EUR
+50	Plano-convex	BK7	091-0225FR+50	62
+100	Plano-convex	BK7	091-0225FR+100	62
+150	Plano-convex	BK7	091-0225FR+150	62
+200	Plano-convex	BK7	091-0225FR+200	62
+300	Plano-convex	BK7	091-0225FR+300	62
+400	Plano-convex	BK7	091-0225FR+400	62
+500	Plano-convex	BK7	091-0225FR+500	62
+50	Plano-convex	UVFS	091-3225FR+50	89
+100	Plano-convex	UVFS	091-3225FR+100	89
+150	Plano-convex	UVFS	091-3225FR+150	89
+200	Plano-convex	UVFS	091-3225FR+200	89
+300	Plano-convex	UVFS	091-3225FR+300	89
+400	Plano-convex	UVFS	091-3225FR+400	89
+500	Plano-convex	UVFS	091-3225FR+500	89

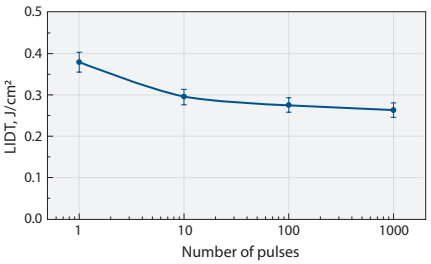
SPHERICAL MIRRORS. Diameter, D = 25.4 mm.
Thickness (edge for plano-concave, center for plano-convex), T = 6.0 mm

Radius, mm	Substrate type	Substrate material	Catalogue number	Price, EUR
-50	Plano-concave	BK7	092-0125FR-50	105
-75	Plano-concave	BK7	092-0125FR-75	105
-100	Plano-concave	BK7	092-0125FR-100	105
-150	Plano-concave	BK7	092-0125FR-150	105
-200	Plano-concave	BK7	092-0125FR-200	105
-250	Plano-concave	BK7	092-0125FR-250	105
-300	Plano-concave	BK7	092-0125FR-300	105
-400	Plano-concave	BK7	092-0125FR-400	105
-500	Plano-concave	BK7	092-0125FR-500	105
-600	Plano-concave	BK7	092-0125FR-600	105
-700	Plano-concave	BK7	092-0125FR-700	105
-750	Plano-concave	BK7	092-0125FR-750	105
-800	Plano-concave	BK7	092-0125FR-800	105
-1000	Plano-concave	BK7	092-0125FR-1000	105
-1500	Plano-concave	BK7	092-0125FR-1500	105
-2000	Plano-concave	BK7	092-0125FR-2000	105
-2500	Plano-concave	BK7	092-0125FR-2500	105
-3000	Plano-concave	BK7	092-0125FR-3000	105
-4000	Plano-concave	BK7	092-0125FR-4000	105
-5000	Plano-concave	BK7	092-0125FR-5000	105
-6000	Plano-concave	BK7	092-0125FR-6000	105
-8000	Plano-concave	BK7	092-0125FR-8000	105
-50	Plano-concave	UVFS	092-0125FR-50	135
-75	Plano-concave	UVFS	092-0125FR-75	135
-100	Plano-concave	UVFS	092-0125FR-100	135
-150	Plano-concave	UVFS	092-0125FR-150	135
-200	Plano-concave	UVFS	092-0125FR-200	135
-250	Plano-concave	UVFS	092-0125FR-250	135
-300	Plano-concave	UVFS	092-0125FR-300	135
-400	Plano-concave	UVFS	092-0125FR-400	135
-500	Plano-concave	UVFS	092-0125FR-500	135
-600	Plano-concave	UVFS	092-3125FR-600	135
-700	Plano-concave	UVFS	092-3125FR-700	135
-750	Plano-concave	UVFS	092-3125FR-750	135
-800	Plano-concave	UVFS	092-3125FR-800	135
-1000	Plano-concave	UVFS	092-3125FR-1000	135
-1500	Plano-concave	UVFS	092-3125FR-1500	135
-2000	Plano-concave	UVFS	092-3125FR-2000	135
-2500	Plano-concave	UVFS	092-3125FR-2500	135
-3000	Plano-concave	UVFS	092-3125FR-3000	135
-4000	Plano-concave	UVFS	092-3125FR-4000	135
-5000	Plano-concave	UVFS	092-3125FR-5000	135
-6000	Plano-concave	UVFS	092-3125FR-6000	135
-8000	Plano-concave	UVFS	092-3125FR-8000	135

Radius, mm	Substrate type	Substrate material	Catalogue number	Price, EUR
+50	Plano-convex	BK7	092-0225FR+50	110
+100	Plano-convex	BK7	092-0225FR+100	110
+150	Plano-convex	BK7	092-0225FR+150	110
+200	Plano-convex	BK7	092-0225FR+200	110
+300	Plano-convex	BK7	092-0225FR+300	110
+400	Plano-convex	BK7	092-0225FR+400	110
+500	Plano-convex	BK7	092-0225FR+500	110
+600	Plano-convex	BK7	092-0225FR+600	110
+800	Plano-convex	BK7	092-0225FR+800	110
+1000	Plano-convex	BK7	092-0225FR+1000	110
+1500	Plano-convex	BK7	092-0225FR+1500	110
+2000	Plano-convex	BK7	092-0225FR+2000	110
+4000	Plano-convex	BK7	092-0225FR+4000	110
+5000	Plano-convex	BK7	092-0225FR+5000	110
+50	Plano-convex	UVFS	092-3225FR+50	140
+100	Plano-convex	UVFS	092-3225FR+100	140
+150	Plano-convex	UVFS	092-3225FR+150	140
+200	Plano-convex	UVFS	092-3225FR+200	140
+300	Plano-convex	UVFS	092-3225FR+300	140
+400	Plano-convex	UVFS	092-3225FR+400	140
+500	Plano-convex	UVFS	092-3225FR+500	140
+600	Plano-convex	UVFS	092-3225FR+600	140
+800	Plano-convex	UVFS	092-3225FR+800	140
+1000	Plano-convex	UVFS	092-3225FR+1000	140
+1500	Plano-convex	UVFS	092-3225FR+1500	140
+2000	Plano-convex	UVFS	092-3225FR+2000	140
+4000	Plano-convex	UVFS	092-3225FR+4000	140
+5000	Plano-convex	UVFS	092-3225FR+5000	140



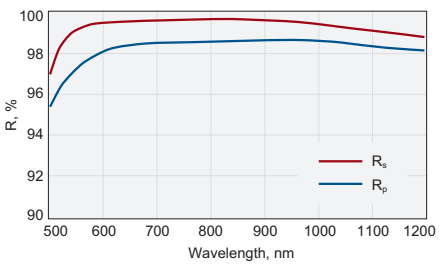
Reflectivity of enhanced silver mirrors, AOI=0°



LIDT of enhanced silver mirrors, AOI=45° @ 800 nm, 100 fs, 100 Hz

TEST CONDITIONS:

Wavelength	800 nm
Pulse duration	99.9 fs
Repetition rate	100 Hz
AOI	45°
Polarization	linear P
Beam diameter (1/e²)	(143 ± 2.3) µm



Reflectivity of enhanced silver mirrors, AOI=45°

SPHERICAL MIRRORS. Diameter, D = 50.8 mm.
Thickness (edge for plano-concave, center for plano-convex), T = 10.0 mm

Radius, mm	Substrate type	Substrate material	Catalogue number	Price, EUR
-100	Plano-concave	BK7	095-0125FR-100	210
-150	Plano-concave	BK7	095-0125FR-150	210
-200	Plano-concave	BK7	095-0125FR-200	210
-250	Plano-concave	BK7	095-0125FR-250	210
-300	Plano-concave	BK7	095-0125FR-300	210
-400	Plano-concave	BK7	095-0125FR-400	210
-500	Plano-concave	BK7	095-0125FR-500	210
-600	Plano-concave	BK7	095-0125FR-600	210
-800	Plano-concave	BK7	095-0125FR-800	210
-1000	Plano-concave	BK7	095-0125FR-1000	210
-1500	Plano-concave	BK7	095-0125FR-1500	210
-2000	Plano-concave	BK7	095-0125FR-2000	210
-2500	Plano-concave	BK7	095-0125FR-2500	210
-3000	Plano-concave	BK7	095-0125FR-3000	210
-4000	Plano-concave	BK7	095-0125FR-4000	210
-5000	Plano-concave	BK7	095-0125FR-5000	210
-6000	Plano-concave	BK7	095-0125FR-6000	210
-8000	Plano-concave	BK7	095-0125FR-8000	210
-10000	Plano-concave	BK7	095-0125FR-10000	210
-100	Plano-concave	UVFS	095-3125FR-100	245
-150	Plano-concave	UVFS	095-3125FR-150	245
-200	Plano-concave	UVFS	095-3125FR-200	245
-250	Plano-concave	UVFS	095-3125FR-250	245
-300	Plano-concave	UVFS	095-3125FR-300	245
-400	Plano-concave	UVFS	095-3125FR-400	245
-500	Plano-concave	UVFS	095-3125FR-500	245
-600	Plano-concave	UVFS	095-3125FR-600	245
-800	Plano-concave	UVFS	095-3125FR-800	245
-1000	Plano-concave	UVFS	095-3125FR-1000	245
-1500	Plano-concave	UVFS	095-3125FR-1500	245
-2000	Plano-concave	UVFS	095-3125FR-2000	245
-2500	Plano-concave	UVFS	095-3125FR-2500	245
-3000	Plano-concave	UVFS	095-3125FR-3000	245
-4000	Plano-concave	UVFS	095-3125FR-4000	245
-5000	Plano-concave	UVFS	095-3125FR-5000	245
-6000	Plano-concave	UVFS	095-3125FR-6000	245
-8000	Plano-concave	UVFS	095-3125FR-8000	245
-10000	Plano-concave	UVFS	095-3125FR-10000	245
+100	Plano-convex	BK7	095-0225FR+100	220
+150	Plano-convex	BK7	095-0225FR+150	220
+200	Plano-convex	BK7	095-0225FR+200	220
+300	Plano-convex	BK7	095-0225FR+300	220
+400	Plano-convex	BK7	095-0225FR+400	220
+500	Plano-convex	BK7	095-0225FR+500	220
+600	Plano-convex	BK7	095-0225FR+600	220
+800	Plano-convex	BK7	095-0225FR+800	220
+1000	Plano-convex	BK7	095-0225FR+1000	220
+1500	Plano-convex	BK7	095-0225FR+1500	220
+2000	Plano-convex	BK7	095-0225FR+2000	220
+100	Plano-convex	UVFS	095-3225FR+100	255
+150	Plano-convex	UVFS	095-3225FR+150	255
+200	Plano-convex	UVFS	095-3225FR+200	255
+300	Plano-convex	UVFS	095-3225FR+300	255
+400	Plano-convex	UVFS	095-3225FR+400	255
+500	Plano-convex	UVFS	095-3225FR+500	255
+600	Plano-convex	UVFS	095-3225FR+600	255
+800	Plano-convex	UVFS	095-3225FR+800	255
+1000	Plano-convex	UVFS	095-3225FR+1000	255
+1500	Plano-convex	UVFS	095-3225FR+1500	255
+2000	Plano-convex	UVFS	095-3225FR+2000	255

SPHERICAL MIRRORS. Diameter, D = 76.2 mm.
Thickness (edge for plano-concave, center for plano-convex), T = 12.7 mm

Radius, mm	Substrate type	Substrate material	Catalogue number	Price, EUR
-200	Plano-concave	BK7	097-0125FR-200	390
-300	Plano-concave	BK7	097-0125FR-300	390
-400	Plano-concave	BK7	097-0125FR-400	390
-500	Plano-concave	BK7	097-0125FR-500	390
-600	Plano-concave	BK7	097-0125FR-600	390
-800	Plano-concave	BK7	097-0125FR-800	390
-1000	Plano-concave	BK7	097-0125FR-1000	390
-2000	Plano-concave	BK7	097-0125FR-2000	390
-3000	Plano-concave	BK7	097-0125FR-3000	390
-200	Plano-concave	UVFS	097-3125FR-200	480
-300	Plano-concave	UVFS	097-3125FR-300	480
-400	Plano-concave	UVFS	097-3125FR-400	480
-500	Plano-concave	UVFS	097-3125FR-500	480
-600	Plano-concave	UVFS	097-3125FR-600	480
-800	Plano-concave	UVFS	097-3125FR-800	480
-1000	Plano-concave	UVFS	097-3125FR-1000	480
-2000	Plano-concave	UVFS	097-3125FR-2000	480
-3000	Plano-concave	UVFS	097-3125FR-3000	480

SPHERICAL MIRRORS. Diameter, D = 101.6 mm.
Thickness (edge for plano-concave, center for plano-convex), T = 15.0 mm

Radius, mm	Substrate type	Substrate material	Catalogue number	Price, EUR
-300	Plano-concave	BK7	098-0125FR-300	650
-400	Plano-concave	BK7	098-0125FR-400	650
-500	Plano-concave	BK7	098-0125FR-500	650
-600	Plano-concave	BK7	098-0125FR-600	650
-800	Plano-concave	BK7	098-0125FR-800	650
-1000	Plano-concave	BK7	098-0125FR-1000	650
-2000	Plano-concave	BK7	098-0125FR-2000	650
-3000	Plano-concave	BK7	098-0125FR-3000	650
-300	Plano-concave	UVFS	098-3125FR-300	750
-400	Plano-concave	UVFS	098-3125FR-400	750
-500	Plano-concave	UVFS	098-3125FR-500	750
-600	Plano-concave	UVFS	098-3125FR-600	750
-800	Plano-concave	UVFS	098-3125FR-800	750
-1000	Plano-concave	UVFS	098-3125FR-1000	750
-2000	Plano-concave	UVFS	098-3125FR-2000	750
-3000	Plano-concave	UVFS	098-3125FR-3000	750

LASER HARMONIC SEPARATORS

FEATURES

- Offered on Ø 0.5 or 1 inch UV FS substrates with surface flatness λ/10

Harmonic separators are dichroic beamsplitters that reflect one wavelength and transmit others. Reflectance is better than 99.5% for the wavelength of interest and transmittance is at least 90% for the rejected wavelengths. The rear surface of harmonic separators is antireflection coated.

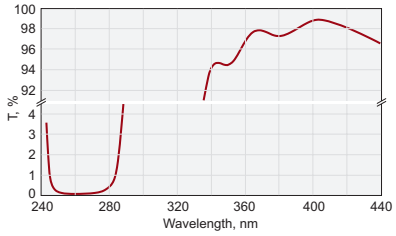
If possible use shorter wavelength for reflection and longer wavelengths for transmission in order to have higher reflection/transmission coefficients.

COATING

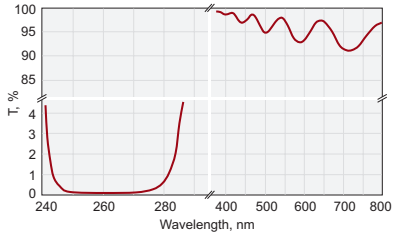
Technology	Electron beam multilayer dielectric
Adhesion and Durability	Per MIL-C-675A. Insoluble in lab solvents
Clear Aperture	Exceeds central 85% of diameter
Coated Surface Flatness	λ/10 at 633 nm over clear aperture
Back side antireflection coated	AOI 45°, R<0.5% AOI 0°, R<0.25%
Laser Damage Threshold	>100 mJ/cm^2, 50 fsec pulse, 800 nm typical

SUBSTRATE

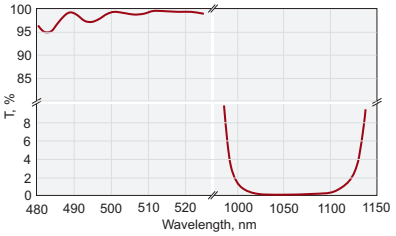
Material	UV grade Fused Silica
S1 Surface Flatness	λ/10 typical at 633 nm
S1 Surface Quality	20–10 scratch & dig (MIL-PRF-13830B)
S2 Surface Flatness	λ/10 typical at 633 nm
S2 Surface Quality	20–10 scratch & dig (MIL-PRF-13830B)
Diameter Tolerance	+0.00 mm; -0.12 mm
Thickness Tolerance	±0.25 mm
Parallelism	< 30 arcsec
Chamfer	0.3 mm at 45° typical



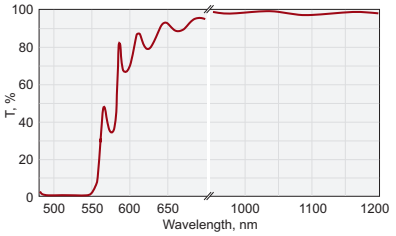
042-2405. *HR>99.5% @ 257-275 nm + HT>95% @ 390-410 nm, AOI=45°*



042-2485. *HR>99.5% @ 257-275 nm + HT>90% @ 400+800 nm, AOI=45°*

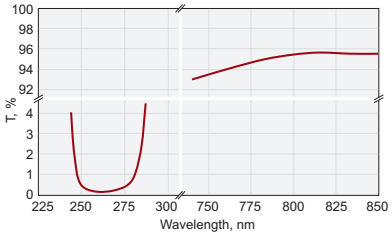


042-6515. *HR>99.5% @ 1030 nm + HT>93% @ 515 nm, AOI=45°*



042-5135. *HR>99.5% @ 500-530 nm + HT>95% @ 1000-1060 nm, AOI=45°*

Reflected wavelength, nm, R > 99.5%	Transmitted wavelength, nm	Trans-mission, %	Ø12.7x3 mm		Ø25.4x3 mm		Ø50.8x8 mm	
			Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
AOI = **0 deg.** Substrate material: **UV grade Fused Silica**								
257 – 275	780 – 820	>95	**041-2800**	145	**042-2800**	175	**045-2800**	265
257 – 275	390 – 410	>95	**041-2400**	145	**042-2400**	175	**045-2400**	265
257 – 275	400 + 800	>90	**041-2480**	165	**042-2480**	195	**045-2480**	295
390 – 410	780 – 820	>95	**041-4800**	145	**042-4800**	175	**045-4800**	265
800	400	>93	**041-0840**	140	**042-0840**	170	**045-0840**	255
333 – 353	1000 – 1060	>95	**041-3130**	135	**042-3130**	165	**045-3130**	245
333 – 353	500 – 530	>95	**041-3450**	135	**042-3450**	165	**045-3450**	245
333 – 353	515 + 1030	>90	**041-3530**	155	**042-3530**	185	**045-3530**	275
500 – 530	1000 – 1060	>95	**041-5130**	135	**042-5130**	165	**045-5130**	245
1030	515	>93	**041-6510**	140	**042-6510**	170	**045-6510**	255
AOI = **45 deg.** Substrate material: **UV grade Fused Silica**								
257 – 275	780 – 820	>95	**041-2805**	145	**042-2805**	175	**045-2805**	265
257 – 275	390 – 410	>95	**041-2405**	145	**042-2405**	175	**045-2405**	265
257 – 275	400 + 800	>90	**041-2485**	165	**042-2485**	195	**045-2485**	295
390 – 410	780 – 820	>95	**041-4805**	145	**042-4805**	175	**045-4805**	265
800	400	>93	**041-0845**	140	**042-0845**	170	**045-0845**	255
333 – 353	1000 – 1060	>95	**041-3135**	135	**042-3135**	165	**045-3135**	245
333 – 353	500 – 530	>95	**041-3455**	135	**042-3455**	165	**045-3455**	245
333 – 353	515 + 1030	>90	**041-3535**	155	**042-3535**	185	**045-3535**	275
500 – 530	1000 – 1060	>95	**041-5135**	135	**042-5135**	165	**045-5135**	245
1030	515	>93	**041-6515**	140	**042-6515**	170	**045-6515**	255



042-2805. *HR>99.5% @ 257-275 nm + HT>95% @ 780-820, AOI=45°*

RELATED PRODUCTS

Pellin-Broca Prisms.
See page 1.53

Adapter for Beamsplitter at 45° 840-0116.

Kinematic Mirror and Beamsplitter Mount 840-0020.

LASER OUTPUT COUPLERS

FEATURES

› Low Group Delay Dispersion

An output coupler is a partially reflecting dielectric mirror used in a laser cavity. It transmits a part of the circulating intracavity power for generating a useful output from the laser.

A low transmission output coupler leads to low laser threshold and possibly to poor laser efficiency if the losses due to output coupling do not dominate other parasitic losses in the laser cavity. The output coupler transmission is often chosen to maximize the output power, although its optimum value may be lower or higher if there are other design purposes (minimizing intracavity intensities or suppressing Q-switching instabilities in a passively mode-locked laser).

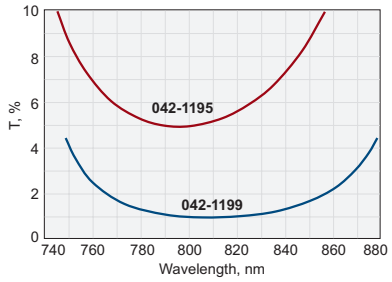
The standard substrates are parallel within 30 arcsec. If you need wedged substrates, please, choose from chapter Wedge Prisms (page 1.51).

COATING

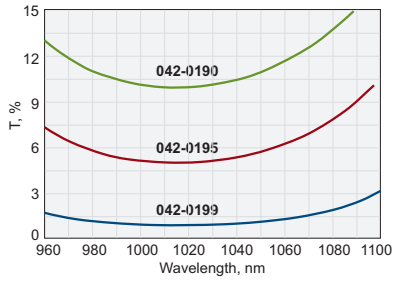
Technology	Electron beam multilayer dielectric
Adhesion and Durability	Per MIL-C-675A. Insoluble in lab solvents
Clear Aperture	Exceeds central 85% of diameter
Angle of Incidence	0 – 8°
Parallelism	30 arcsec
Back side antireflection coated	R < 0.25%
Laser Damage Threshold	>100 mJ/cm², 50 fsec pulse, 800 nm typical

SUBSTRATE

Material	UV grade Fused Silica
S1 Surface Flatness	λ/10 typical at 633 nm
S1 Surface Quality	20 –10 scratch & dig (MIL-PRF-13830B)
S2 Surface Flatness	λ/10 typical at 633 nm
S2 Surface Quality	20 –10 scratch & dig (MIL-PRF-13830B)
Diameter Tolerance	+0.00 mm; -0.12 mm
Thickness Tolerance	±0.25 mm
Parallelism	< 30 arcsec
Chamfer	0.3 mm at 45° typical



042-1199. *PR = 99±0.5% @ 800 nm, T = 1±0.5%*
042-1195. *PR = 95±2% @ 800 nm, T = 5±2%*



042-0199. *PR = 99±0.5% @ 1030 nm, T = 1±0.5%*
042-0195. *PR = 95±2% @ 1030 nm, T = 5±2%*
042-0190. *PR = 90±2% @ 1030 nm, T = 10±2%*

Wavelength, nm	Reflection, %	Transmission, %	Ø12.7x3 mm		Ø25.4x3 mm		Ø50.8x8 mm	
			Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
Substrate material: **UV grade Fused Silica**								
1030	50±3	50±3	041-0150	105	042-0150	125	045-0150	205
1030	60±3	40±3	041-0160	105	042-0160	125	045-0160	205
1030	65±3	35±3	041-0165	105	042-0165	125	045-0165	205
1030	70±3	30±3	041-0170	105	042-0170	125	045-0170	205
1030	75±3	25±3	041-0175	105	042-0175	125	045-0175	205
1030	80±3	20±3	041-0180	105	042-0180	125	045-0180	205
1030	85±3	15±3	041-0185	105	042-0185	125	045-0185	205
1030	90±2	10±2	041-0190	112	042-0190	132	045-0190	220
1030	95±2	5±2	041-0195	112	042-0195	132	045-0195	220
1030	97±1	3±1	041-0197	119	042-0197	139	045-0197	245
1030	98±1	2±1	041-0198	119	042-0198	139	045-0198	245
1030	99.0±0.5	1.0±0.5	041-0199	126	042-0199	146	045-0199	255
800	50±3	50±3	041-1150	105	042-1150	125	045-1150	205
800	60±3	40±3	041-1160	105	042-1160	125	045-1160	205
800	65±3	35±3	041-1165	105	042-1165	125	045-1165	205
800	70±3	30±3	041-1170	105	042-1170	125	045-1170	205
800	75±3	25±3	041-1175	105	042-1175	125	045-1175	205
800	80±3	20±3	041-1180	105	042-1180	125	045-1180	205
800	85±3	15±3	041-1185	105	042-1185	125	045-1185	205
800	90±2	10±2	041-1190	112	042-1190	132	045-1190	220
800	95±2	5±2	041-1195	112	042-1195	132	045-1195	220
800	97±1	3±1	041-1197	119	042-1197	139	045-1197	245
800	98±1	2±1	041-1198	119	042-1198	139	045-1198	245
800	99.0±0.5	1.0±0.5	041-1199	126	042-1199	146	045-1199	255

RELATED PRODUCTS

Uncoated Elliptical Mirrors
See page 1.10

Kinematic Mirror and Beamsplitter Mount 840-0020

LASER REAR MIRRORS

High reflectivity (R>99.8%) dielectric coatings with high laser damage threshold are applied on laser rear mirrors. UV FS substrates are recommended for high power laser applications.

Back side can be AR coated to avoid back reflection from second surface on request.

COATING

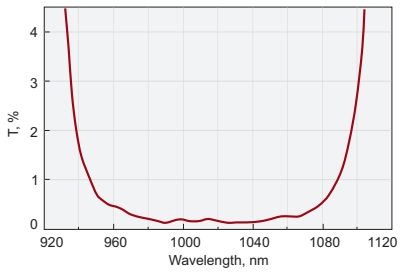
Technology	Electron beam multilayer dielectric
Adhesion and Durability	Per MIL-C-675A. Insoluble in lab solvents
Clear Aperture	Exceeds central 85% of diameter
Angle of Incidence	0 – 8° (normal)
Coating	Hard dielectric high reflection: R>99.7% at 800 nm and 1030 nm R>99% at 720 – 880 nm
Laser Damage Threshold	>100 mJ/cm^2, 50 fsec pulse, 800 nm typical

SUBSTRATE

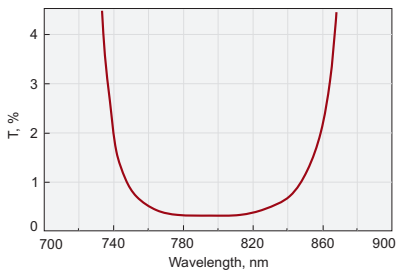
Material	UV grade Fused Silica or BK7 glass
S1 Surface Flatness	λ/10 at 633 nm
S1 Surface Quality	20 –10 scratch & dig (MIL-PRF-13830B)
S2 Surface Quality	Commercial polish
Diameter Tolerance	+0.00 mm; -0.12 mm
Thickness Tolerance	±0.25
Chamfer	0.3 mm at 45° typical

Wavelength, nm	Substrate type	Radius, mm	Substrate material BK7				Substrate material UVFS			
			Ø25.4×6 mm		Ø50.8×10 mm		Ø25.4×6 mm		Ø50.8×10 mm	
			Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030±30	Plano-plano	-∞	032-1030-i0	75	035-1030-i0 *	110	042-1030-i0	90	045-1030-i0 *	169
1030±30	Plano-concave	-50	012-8005	99	015-8005	145	022-8005	119	025-8005	209
1030±30	Plano-concave	-100	012-8010	99	015-8010	145	022-8010	119	025-8010	209
1030±30	Plano-concave	-150	012-8015	99	015-8015	145	022-8015	119	025-8015	209
1030±30	Plano-concave	-200	012-8020	99	015-8020	145	022-8020	119	025-8020	209
1030±30	Plano-concave	-250	012-8025	99	015-8025	145	022-8025	119	025-8025	209
1030±30	Plano-concave	-500	012-8050	99	015-8050	145	022-8050	119	025-8050	209
1030±30	Plano-concave	-1000	012-8100	99	015-8100	145	022-8100	119	025-8100	209
1030±30	Plano-concave	-2000	012-8200	99	015-8200	145	022-8200	119	025-8200	209
1030±30	Plano-concave	-2500	012-8250	99	015-8250	145	022-8250	119	025-8250	209
1030±30	Plano-concave	-4000	012-8400	99	015-8400	145	022-8400	119	025-8400	209
1030±30	Plano-concave	-5000	012-8500	99	015-8500	145	022-8500	119	025-8500	209
1030±30	Plano-convex	+100	012-9010	103	015-9010	155	022-9010	123	025-9010	219
1030±30	Plano-convex	+200	012-9020	103	015-9020	155	022-9020	123	025-9020	219
1030±30	Plano-convex	+500	012-9050	103	015-9050	155	022-9050	123	025-9050	219
1030±30	Plano-convex	+1000	012-9100	103	015-9100	155	022-9100	123	025-9100	219
1030±30	Plano-convex	+2000	012-9200	103	015-9200	155	022-9200	123	025-9200	219
1030±30	Plano-convex	+4000	012-9400	103	015-9400	155	022-9400	123	025-9400	219

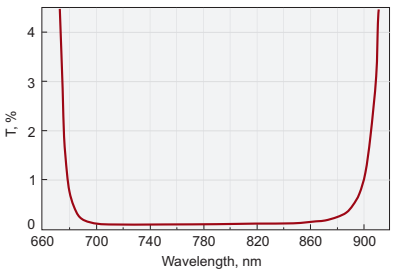
** Thickness of plano-plano rear mirrors of Ø50.8 is 8 mm.*



HR>99.7% @ 1030±30 nm, AOI=0°



HR>99.7% @ 800±20 nm, AOI=0°



HR>99.0% @ 720 – 880 nm, AOI=0°

Wavelength, nm	Substrate type	Radius, mm	Substrate material BK7				Substrate material UVFS			
			Ø25.4×6 mm		Ø50.8×10 mm		Ø25.4×6 mm		Ø50.8×10 mm	
			Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
800±30	Plano-plano	-∞	032-0800-i0	85	035-0800-i0 *	133	042-0800-i0	97	045-0800-i0 *	181
800±30	Plano-concave	-50	062-8005	99	065-8005	145	082-8005	119	085-8005	209
800±30	Plano-concave	-100	062-8010	99	065-8010	145	082-8010	119	085-8010	209
800±30	Plano-concave	-150	062-8015	99	065-8015	145	082-8015	119	085-8015	209
800±30	Plano-concave	-200	062-8020	99	065-8020	145	082-8020	119	085-8020	209
800±30	Plano-concave	-250	062-8025	99	065-8025	145	082-8025	119	085-8025	209
800±30	Plano-concave	-500	062-8050	99	065-8050	145	082-8050	119	085-8050	209
800±30	Plano-concave	-1000	062-8100	99	065-8100	145	082-8100	119	085-8100	209
800±30	Plano-concave	-2000	062-8200	99	065-8200	145	082-8200	119	085-8200	209
800±30	Plano-concave	-2500	062-8250	99	065-8250	145	082-8250	119	085-8250	209
800±30	Plano-concave	-4000	062-8400	99	065-8400	145	082-8400	119	085-8400	209
800±30	Plano-concave	-5000	062-8500	99	065-8500	145	082-8500	119	085-8500	209
800±30	Plano-convex	+100	062-9010	103	065-9010	155	082-9010	123	085-9010	219
800±30	Plano-convex	+200	062-9020	103	065-9020	155	082-9020	123	085-9020	219
800±30	Plano-convex	+500	062-9050	103	065-9050	155	082-9050	123	085-9050	219
800±30	Plano-convex	+1000	062-9100	103	065-9100	155	082-9100	123	085-9100	219
800±30	Plano-convex	+2000	062-9200	103	065-9200	155	082-9200	123	085-9200	219
800±30	Plano-convex	+4000	062-9400	103	065-9400	155	082-9400	123	085-9400	219

** Thickness of plano-plano rear mirrors of Ø50.8 is 8 mm.*

Wavelength, nm	Substrate type	Radius, mm	Substrate material BK7				Substrate material UVFS			
			Ø25.4×6 mm		Ø50.8×10 mm		Ø25.4×6 mm		Ø50.8×10 mm	
			Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
720 – 880	Plano-plano	-∞	072-7288-i0	104	075-7288-i0 *	220	082-7288-i0	129	085-7288-i0 *	255
720 – 880	Plano-concave	-50	062-8005B	128	065-8005B	245	082-8005B	153	085-8005B	280
720 – 880	Plano-concave	-100	062-8010B	128	065-8010B	245	082-8010B	153	085-8010B	280
720 – 880	Plano-concave	-150	062-8015B	128	065-8015B	245	082-8015B	153	085-8015B	280
720 – 880	Plano-concave	-200	062-8020B	128	065-8020B	245	082-8020B	153	085-8020B	280
720 – 880	Plano-concave	-250	062-8025B	128	065-8025B	245	082-8025B	153	085-8025B	280
720 – 880	Plano-concave	-500	062-8050B	128	065-8050B	245	082-8050B	153	085-8050B	280
720 – 880	Plano-concave	-1000	062-8100B	128	065-8100B	245	082-8100B	153	085-8100B	280
720 – 880	Plano-concave	-2000	062-8200B	128	065-8200B	245	082-8200B	153	085-8200B	280
720 – 880	Plano-concave	-2500	062-8250B	128	065-8250B	245	082-8250B	153	085-8250B	280
720 – 880	Plano-concave	-3000	062-8300B	128	065-8300B	245	082-8300B	153	085-8300B	280
720 – 880	Plano-concave	-4000	062-8400B	128	065-8400B	245	082-8400B	153	085-8400B	280
720 – 880	Plano-concave	-5000	062-8500B	128	065-8500B	245	082-8500B	153	085-8500B	280
720 – 880	Plano-convex	+100	062-9010B	132	065-9010B	250	082-9010B	157	085-9010B	285
720 – 880	Plano-convex	+200	062-9020B	132	065-9020B	250	082-9020B	157	085-9020B	285
720 – 880	Plano-convex	+500	062-9050B	132	065-9050B	250	082-9050B	157	085-9050B	285
720 – 880	Plano-convex	+600	062-9060B	132	065-9060B	250	082-9060B	157	085-9060B	285
720 – 880	Plano-convex	+1000	062-9100B	132	065-9100B	250	082-9100B	157	085-9100B	285
720 – 880	Plano-convex	+1500	062-9150B	132	065-9150B	250	082-9150B	157	085-9150B	285
720 – 880	Plano-convex	+2000	062-9200B	132	065-9200B	250	082-9200B	157	085-9200B	285
720 – 880	Plano-convex	+4000	062-9400B	132	065-9400B	250	082-9400B	157	085-9400B	285

** Thickness of plano-plano rear mirrors of Ø50.8 is 8 mm.*

RELATED PRODUCTS

Uncoated Curved Windows
See page 1.8

Kinematic Mirror Mount 840-0010

Kinematic Mirror and Beamsplitter Mount 840-0020

LASER BEAMSPLITTERS

Beamsplitter splits average polarized laser beam in two beams separated 90° from each other. The standard substrate thickness is 3 mm. If you need thinner substrate, please, choose from chapter Precision Thin Round Windows (page 1.11).

Please contact us for wedged beamsplitters or choose wedged substrates from Wedge Prisms *(page 1.51)*

COATING

Technology	Electron beam multilayer dielectric
Adhesion and Durability	Per MIL-C-675A. Insoluble in lab solvents
Clear Aperture	Exceeds central 85% of diameter
Angle of Incidence	45±3°
Back side antireflection coated	R<0.5%

SUBSTRATE

Material	UV grade Fused Silica
S1 Surface Flatness	λ/10 typical at 633 nm
S1 Surface Quality	20–10 scratch & dig (MIL-PRF-13830B)
S2 Surface Flatness	λ/10 typical at 633 nm
S2 Surface Quality	20–10 scratch & dig (MIL-PRF-13830B)
Diameter Tolerance	+0.00 mm; -0.12 mm
Thickness Tolerance	±0.25 mm
Parallelism	< 30 arcsec
Chamfer	0.3 mm at 45° typical

DESIGNED FOR AVERAGE POLARIZATION: **$R=(R_s+R_p)/2$ and $T=(T_s+T_p)/2$.** Laser Damage Threshold: >100 mJ/cm^2, 50 fsec pulse, 800 nm typical

Wavelength, nm	Reflection, %	Transmission, %	Substrate material	Ø12.7 × 3 mm		Ø25.4 × 3 mm		Ø50.8 × 8 mm	
				Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	20±3	80±3	UV FS	031-7420A	105	032-7420A	125	035-7420A	205
1030	30±3	70±3	UV FS	031-7430A	105	032-7430A	125	035-7430A	205
1030	50±3	50±3	UV FS	031-7450A	105	032-7450A	125	035-7450A	205
1030	70±3	30±3	UV FS	031-7470A	105	032-7470A	125	035-7470A	205
1030	80±3	20±3	UV FS	031-7480A	105	032-7480A	125	035-7480A	205
515	20±3	80±3	UV FS	031-7520A	103	032-7520A	123	035-7520A	200
515	30±3	70±3	UV FS	031-7530A	103	032-7530A	123	035-7530A	200
515	50±3	50±3	UV FS	031-7550A	103	032-7550A	123	035-7550A	200
515	70±3	30±3	UV FS	031-7570A	103	032-7570A	123	035-7570A	200
515	80±3	20±3	UV FS	031-7580A	103	032-7580A	123	035-7580A	200
343	20±3	80±3	UV FS	031-7620A	110	032-7620A	140	035-7620A	245
343	30±3	70±3	UV FS	031-7630A	110	032-7630A	140	035-7630A	245
343	50±3	50±3	UV FS	031-7650A	110	032-7650A	140	035-7650A	245
343	70±3	30±3	UV FS	031-7670A	110	032-7670A	140	035-7670A	245
343	80±3	20±3	UV FS	031-7680A	110	032-7680A	140	035-7680A	245
800	20±3	80±3	UV FS	041-7720A	105	042-7720A	125	045-7720A	205
800	30±3	70±3	UV FS	041-7730A	105	042-7730A	125	045-7730A	205
800	50±3	50±3	UV FS	041-7750A	105	042-7750A	125	045-7750A	205
800	70±3	30±3	UV FS	041-7770A	105	042-7770A	125	045-7770A	205
800	80±3	20±3	UV FS	041-7780A	105	042-7780A	125	045-7780A	205
400	20±3	80±3	UV FS	041-7820A	103	042-7820A	123	045-7820A	200
400	30±3	70±3	UV FS	041-7830A	103	042-7830A	123	045-7830A	200
400	50±3	50±3	UV FS	041-7850A	103	042-7850A	123	045-7850A	200
400	70±3	30±3	UV FS	041-7870A	103	042-7870A	123	045-7870A	200
400	80±3	20±3	UV FS	041-7880A	103	042-7880A	123	045-7880A	200
266	20±3	80±3	UV FS	041-7920A	115	042-7920FA	145	045-7920A	265
266	30±3	70±3	UV FS	041-7930A	115	042-7930FA	145	045-7930A	265
266	50±3	50±3	UV FS	041-7950A	115	042-7950FA	145	045-7950A	265
266	70±3	30±3	UV FS	041-7970A	115	042-7970FA	145	045-7970A	265
266	80±3	20±3	UV FS	041-7980A	115	042-7980FA	145	045-7980A	265

DESIGNED FOR **S- POLARIZATION.** Laser Damage Threshold: >100 mJ/cm², 50 fsec pulse, 800 nm typical

Wavelength, nm	Reflection, %	Transmission, %	Substrate material	Ø12.7 × 3 mm		Ø25.4 × 3 mm		Ø50.8 × 8 mm	
				Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	20±3	80±3	UV FS	031-7420S	105	032-7420S	125	035-7420S	205
1030	30±3	70±3	UV FS	031-7430S	105	032-7430S	125	035-7430S	205
1030	50±3	50±3	UV FS	031-7450S	105	032-7450S	125	035-7450S	205
1030	70±3	30±3	UV FS	031-7470S	105	032-7470S	125	035-7470S	205
1030	80±3	20±3	UV FS	031-7480S	105	032-7480S	125	035-7480S	205
515	20±3	80±3	UV FS	031-7520S	103	032-7520S	123	035-7520S	200
515	30±3	70±3	UV FS	031-7530S	103	032-7530S	123	035-7530S	200
515	50±3	50±3	UV FS	031-7550S	103	032-7550S	123	035-7550S	200
515	70±3	30±3	UV FS	031-7570S	103	032-7570S	123	035-7570S	200
515	80±3	20±3	UV FS	031-7580S	103	032-7580S	123	035-7580S	200
343	20±3	80±3	UV FS	031-7620S	110	032-7620S	140	035-7620S	245
343	30±3	70±3	UV FS	031-7630S	110	032-7630S	140	035-7630S	245
343	50±3	50±3	UV FS	031-7650S	110	032-7650S	140	035-7650S	245
343	70±3	30±3	UV FS	031-7670S	110	032-7670S	140	035-7670S	245
343	80±3	20±3	UV FS	031-7680S	110	032-7680S	140	035-7680S	245
800	20±3	80±3	UV FS	041-7720S	105	042-7720S	125	045-7720S	205
800	30±3	70±3	UV FS	041-7730S	105	042-7730S	125	045-7730S	205
800	50±3	50±3	UV FS	041-7750S	105	042-7750S	125	045-7750S	205
800	70±3	30±3	UV FS	041-7770S	105	042-7770S	125	045-7770S	205
800	80±3	20±3	UV FS	041-7780S	105	042-7780S	125	045-7780S	205
400	20±3	80±3	UV FS	041-7820S	103	042-7820S	123	045-7820S	200
400	30±3	70±3	UV FS	041-7830S	103	042-7830S	123	045-7830S	200
400	50±3	50±3	UV FS	041-7850S	103	042-7850S	123	045-7850S	200
400	70±3	30±3	UV FS	041-7870S	103	042-7870S	123	045-7870S	200
400	80±3	20±3	UV FS	041-7880S	103	042-7880S	123	045-7880S	200
266	20±3	80±3	UV FS	041-7920S	115	042-7920FS	145	045-7920S	265
266	30±3	70±3	UV FS	041-7930S	115	042-7930FS	145	045-7930S	265
266	50±3	50±3	UV FS	041-7950S	115	042-7950FS	145	045-7950S	265
266	70±3	30±3	UV FS	041-7970S	115	042-7970FS	145	045-7970S	265
266	80±3	20±3	UV FS	041-7980S	115	042-7980FS	145	045-7980S	265

DESIGNED FOR **P- POLARIZATION.** Laser Damage Threshold: >100 mJ/cm², 50 fsec pulse, 800 nm typical

Wavelength, nm	Reflection, %	Transmission, %	Substrate material	Ø12.7 × 3 mm		Ø25.4 × 3 mm		Ø50.8 × 8 mm	
				Catalogue number	Price, EUR	Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	20±3	80±3	UV FS	031-7420P	105	032-7420P	125	035-7420P	205
1030	30±3	70±3	UV FS	031-7430P	105	032-7430P	125	035-7430P	205
1030	50±3	50±3	UV FS	031-7450P	105	032-7450P	125	035-7450P	205
1030	70±3	30±3	UV FS	031-7470P	105	032-7470P	125	035-7470P	205
1030	80±3	20±3	UV FS	031-7480P	105	032-7480P	125	035-7480P	205
515	20±3	80±3	UV FS	031-7520P	103	032-7520P	123	035-7520P	200
515	30±3	70±3	UV FS	031-7530P	103	032-7530P	123	035-7530P	200
515	50±3	50±3	UV FS	031-7550P	103	032-7550P	123	035-7550P	200
515	70±3	30±3	UV FS	031-7570P	103	032-7570P	123	035-7570P	200
515	80±3	20±3	UV FS	031-7580P	103	032-7580P	123	035-7580P	200
343	20±3	80±3	UV FS	031-7620P	110	032-7620P	140	035-7620P	245
343	30±3	70±3	UV FS	031-7630P	110	032-7630P	140	035-7630P	245
343	50±3	50±3	UV FS	031-7650P	110	032-7650P	140	035-7650P	245
343	70±3	30±3	UV FS	031-7670P	110	032-7670P	140	035-7670P	245
343	80±3	20±3	UV FS	031-7680P	110	032-7680P	140	035-7680P	245
800	20±3	80±3	UV FS	041-7720P	105	042-7720P	125	045-7720P	205
800	30±3	70±3	UV FS	041-7730P	105	042-7730P	125	045-7730P	205
800	50±3	50±3	UV FS	041-7750P	105	042-7750P	125	045-7750P	205
800	70±3	30±3	UV FS	041-7770P	105	042-7770P	125	045-7770P	205
800	80±3	20±3	UV FS	041-7780P	105	042-7780P	125	045-7780P	205
400	20±3	80±3	UV FS	041-7820P	103	042-7820P	123	045-7820P	200
400	30±3	70±3	UV FS	041-7830P	103	042-7830P	123	045-7830P	200
400	50±3	50±3	UV FS	041-7850P	103	042-7850P	123	045-7850P	200
400	70±3	30±3	UV FS	041-7870P	103	042-7870P	123	045-7870P	200
400	80±3	20±3	UV FS	041-7880P	103	042-7880P	123	045-7880P	200
266	20±3	80±3	UV FS	041-7920P	115	042-7920FP	145	045-7920P	265
266	30±3	70±3	UV FS	041-7930P	115	042-7930FP	145	045-7930P	265
266	50±3	50±3	UV FS	041-7950P	115	042-7950FP	145	045-7950P	265
266	70±3	30±3	UV FS	041-7970P	115	042-7970FP	145	045-7970P	265
266	80±3	20±3	UV FS	041-7980P	115	042-7980FP	145	045-7980P	265

BROADBAND LASER BEAMSPLITTERS

DESIGNED FOR **S- POLARIZATION.** Laser Damage Threshold: >50 mJ/cm², 50 fsec pulse, 800 nm typical

Wavelength, nm	Reflection, %	Transmission, %	Substrate material	Ø25.4 × 3 mm		Ø50.8 × 6 mm	
				Catalogue number	Price, EUR	Catalogue number	Price, EUR
720 – 880	8±1	92±1	UV FS	042-7708SB	110	045-7708SB	185
720 – 880	20±5	80±5	UV FS	042-7720SB	185	045-7720SB	340
720 – 880	30±5	70±5	UV FS	042-7730SB	185	045-7730SB	340
720 – 880	40±5	60±5	UV FS	042-7740SB	185	045-7740SB	340
720 – 880	50±5	50±5	UV FS	042-7750SB	185	045-7750SB	340
720 – 880	60±5	40±5	UV FS	042-7760SB	190	045-7760SB	360
720 – 880	70±5	30±5	UV FS	042-7770SB	195	045-7770SB	390
720 – 880	80±5	20±5	UV FS	042-7780SB	195	045-7780SB	390
720 – 880	90±3	10±3	UV FS	042-7790SB	215	045-7790SB	440
720 – 880	95±2	5±2	UV FS	042-7795SB	225	045-7795SB	470

DESIGNED FOR **P- POLARIZATION.** Laser Damage Threshold: >50 mJ/cm², 50 fsec pulse, 800 nm typical

Wavelength, nm	Reflection, %	Transmission, %	Substrate material	Ø25.4 × 3 mm		Ø50.8 × 6 mm	
				Catalogue number	Price, EUR	Catalogue number	Price, EUR
750 – 850	10±2	90±2	UV FS	042-7708PB	185	045-7708PB	340
750 – 850	20±5	80±5	UV FS	042-7720PB	185	045-7720PB	340
750 – 850	25±5	75±5	UV FS	042-7725PB	185	045-7725PB	340
750 – 850	30±5	70±5	UV FS	042-7730PB	185	045-7730PB	340
750 – 850	40±5	60±5	UV FS	042-7740PB	185	045-7740PB	340
750 – 850	50±5	50±5	UV FS	042-7750PB	185	045-7750PB	340
750 – 850	60±5	40±5	UV FS	042-7760PB	190	045-7760PB	360
750 – 850	70±5	30±5	UV FS	042-7770PB	195	045-7770PB	390
750 – 850	75±5	25±5	UV FS	042-7775PB	195	045-7775PB	390
750 – 850	80±5	20±5	UV FS	042-7780PB	195	045-7780PB	390
750 – 850	90±3	10±3	UV FS	042-7790PB	215	045-7790PB	440
750 – 850	95±2	5±2	UV FS	042-7795PB	225	045-7795PB	470

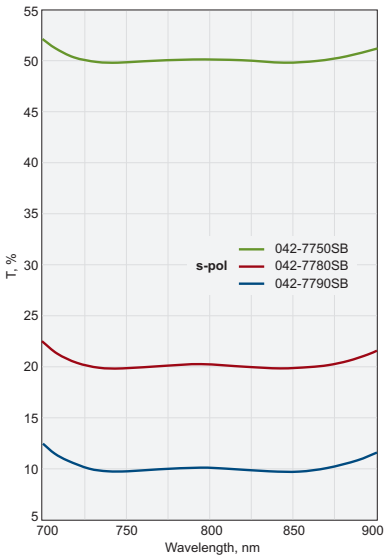
RELATED PRODUCTS

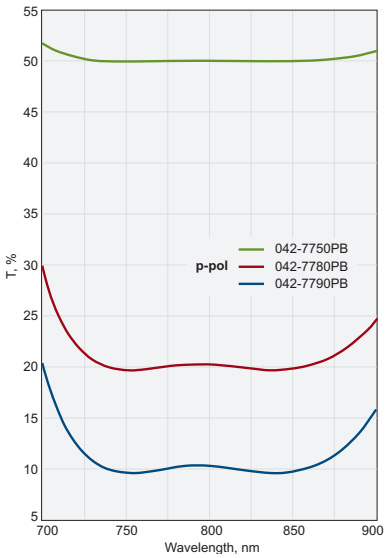
Uncoated Elliptical Mirrors
See page 1.10

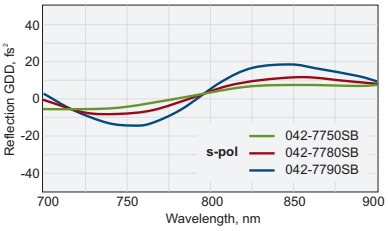
Kinematic Mirror and Beamsplitter Mount 840-0030-02

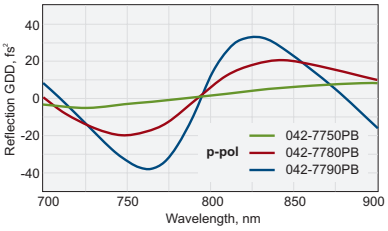
Adapter for Beamsplitter at 45° 840-0116

Flipping Mirror / Beamsplitter Mount 840-0155









042-7750SB. *Rs=50±5% @ 720–880 nm, AOI=45°*
042-7780SB. *Rp=80±5% @ 720–880 nm, AOI=45°*
042-7790SB. *Rp=90±3% @ 720–880 nm, AOI=45°*

042-7750PB. *Rp=50±5% @ 750–850 nm, AOI=45°*
042-7780PB. *Rp=80±5% @ 750–850 nm, AOI=45°*
042-7790PB. *Rp=90±3% @ 750–850 nm, AOI=45°*

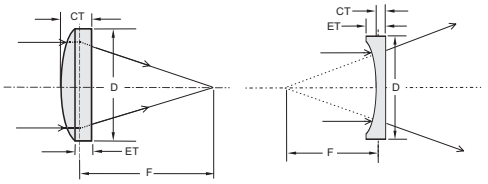
THIN LENSES

FEATURES

- Very thin: edge thickness varies from 0.5~1.9 mm
- Centre thickness varies from 1~3 mm
- Plano-Convex or Plano-Concave type
- Uncoated,
  AR coated @ 333-353 nm, AR coated @ 380-420 nm,
  AR coated @ 500-530 nm, AR coated @ 515+1030 nm,
  AR coated @ 760-840 nm, AR coated @ 1000-1060 nm,
  BBAR @ 700-900 nm, UBBAR @ 350-900 nm

SPECIFICATIONS

Material	UV FS
Surface quality	40 – 20 scratch & dig (MIL-PRF-13830B)
Clear aperture	90% of the diameter
Diameter tolerance	+0.00; -0.12 mm
Thickness tolerance	±0.2 mm
Surface irregularity	λ/8 @ 633 nm
Concentricity	3 arcmin
Paraxial focal length	±2% @ 800 nm



Plano-convex lens *Plano-concave lens*

THIN PLANO-CONVEX LENSES, Ø12.7 mm

UNCOATED LENSES. Material – UVFS. Diameter D = Ø12.7 mm

Focal Length, mm @ 800 nm	Centre Thickness CT, mm	Edge Thickness ET, mm	Radius, mm	Catalogue number	Price, EUR
30	2.5	1.0	13.6	110-1106ET	60
40	1.8	0.7	18.1	110-1108ET	60
50	1.9	1.0	22.7	110-1109ET	60
75	1.8	1.2	34.0	110-1111ET	60
100	1.5	0.9	45.3	110-1115ET	60
125	1.4	1.0	56.7	110-1117ET	60
150	1.5	1.2	68.0	110-1119ET	60
175	1.2	1.0	79.3	110-1121ET	60
200	1.2	1.0	90.7	110-1123ET	60
250	1.1	1.0	113.3	110-1126ET	60
300	1.1	1.0	136.0	110-1129ET	60
400	1.1	1.0	181.3	110-1133ET	60
450	1.1	1.0	204.0	110-1135ET	60
500	1.1	1.0	226.7	110-1137ET	60

THIN PLANO-CONVEX LENSES, Ø25.4 mm

UNCOATED LENSES. Material – UVFS. Diameter D = Ø25.4 mm

Focal Length, mm @ 800 nm	Centre Thickness CT, mm	Edge Thickness ET, mm	Radius, mm	Catalogue number	Price, EUR
50	4.9	1.0	22.7	110-1205ET	80
75	3	0.5	34.0	110-1209ET	80
100	2.5	0.7	45.3	110-1211ET	80
125	2	0.6	56.7	110-1216ET	80
150	2	0.8	68.0	110-1217ET	80
200	2	1.1	90.7	110-1219ET	80
300	2	1.4	136.0	110-1223ET	80
350	2	1.5	158.7	110-1225ET	80
400	2	1.6	181.3	110-1227ET	80
450	2	1.6	204.0	110-1231ET	80
500	2	1.6	226.7	110-1233ET	80
1000	1.5	1.3	453.3	110-1245ET	80
1500	1.4	1.3	680.0	110-1255ET	80
2000	1.4	1.3	906.6	110-1265ET	80

THIN PLANO-CONVEX LENSES, Ø50.8 mm

UNCOATED LENSES. Material – UVFS. Diameter D = Ø50.8 mm

Focal Length, mm @ 800 nm	Centre Thickness CT, mm	Edge Thickness ET, mm	Radius, mm	Catalogue number	Price, EUR
75	14	2.5	34.0	110-1505ET	180
100	10.3	2.5	45.3	110-1509ET	180
150	7.4	2.5	68.0	110-1511ET	180
200	6.1	2.5	90.7	110-1515ET	180
300	4.9	2.5	136.0	110-1519ET	180
400	4.3	2.5	181.3	110-1523ET	180
500	3.9	2.5	226.7	110-1527ET	180
1000	3.2	2.5	453.3	110-1545ET	180
1500	3	2.5	680.0	110-1550ET	180
2000	2.9	2.5	906.6	110-1555ET	180
3000	2.7	2.5	1360.0	110-1566ET	180
4000	2.7	2.5	1813.3	110-1568ET	180
5000	2.6	2.5	2266.6	110-1567ET	180
6000	2.6	2.5	2719.9	110-1570ET	180

THIN PLANO-CONCAVE LENSES, Ø12.7 mm

UNCOATED LENSES. Material – UVFS. Diameter D = Ø12.7 mm

Focal Length, mm @ 800 nm	Centre Thickness CT, mm	Edge Thickness ET, mm	Radius, mm	Catalogue number	Price, EUR
-20	1	3.5	-9.1	112-1104ET	60
-30	1	2.5	-13.6	112-1106ET	60
-40	1	2.1	-18.1	112-1108ET	60
-50	1	1.9	-22.7	112-1109ET	60
-60	1	1.7	-27.2	112-1110ET	60
-75	1	1.5	-34.0	112-1112ET	60
-80	1	1.5	-36.3	112-1113ET	60
-100	1	1.4	-45.3	112-1115ET	60
-125	1	1.3	-56.7	112-1117ET	60
-150	1	1.2	-68.0	112-1119ET	60

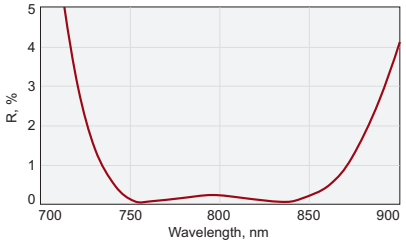
AVAILABLE STANDARD COATINGS FOR THIN LENSES

SPECIFICATIONS

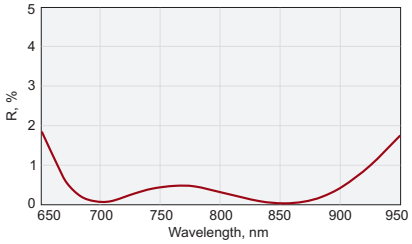
Technology	Electron beam multilayer dielectric
Adhesion and Durability	Per MIL-C-675A. Insoluble in lab solvents
Clear Aperture	Exceeds central 85% of diameter
Angle of Incidence	0°
Coated Surface Flatness	λ/10 at 633 nm over clear aperture

AVAILABLE COATINGS

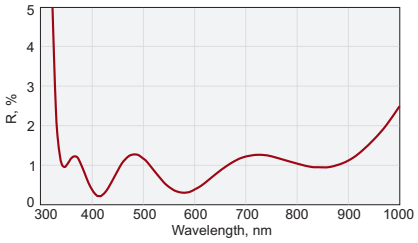
Wavelength	Reflection per surface	Laser Damage Threshold	Coating suffix	Price per unit to be addded, EUR/pc.
760 – 840 nm	R<0.5%	100 mJ/cm²	**AR**	29
700 – 900 nm	R<0.5%	50 mJ/cm²	**BBAR**	50
350 – 900 nm	R<1.5%	50 mJ/cm²	**UBBAR**	60
1000 – 1060 nm	R<0.3%	100 mJ/cm²	**AR1030**	29
500 – 530 nm	R<0.4%	100 mJ/cm²	**AR515**	29
380 – 420 nm	R<0.5%	100 mJ/cm²	**AR400**	29
333 – 353 nm	R<0.5%	100 mJ/cm²	**AR343**	29
515 + 1030 nm	R<0.5%	100 mJ/cm²	**ARD**	35



Reflectivity @ 760-840 nm



Reflectivity @ 700-900 nm



Reflectivity @ 350-900 nm

AVAILABLE IBS COATINGS FOR THIN LENSES

SPECIFICATIONS

Technology	Ion Beam Sputtering (IBS)
Adhesion and Durability	Per MIL-C-675A. Insoluble in lab solvents
Clear Aperture	Exceeds central 85% of diameter
Angle of Incidence	0°
Coated Surface Flatness	λ/10 at 633 nm over clear aperture

AVAILABLE COATINGS

Wavelength	Reflection per surface	Laser Damage Threshold	Coating suffix	Price per unit to be addded, EUR/pc.
760 – 840 nm	R<0.1%	100 mJ/cm²	**AR800HT**	105
700 – 900 nm	R<0.1%	100 mJ/cm²	**ARB800HT**	115
380 – 420 nm	R<0.2%	50 mJ/cm²	**AR400HT**	105
400 + 800 nm	R<0.2%	50 mJ/cm²	**ARD800HT**	115
1000 – 1060 nm	R<0.1%	100 mJ/cm²	**AR1030HT**	105
500 – 530 nm	R<0.1%	50 mJ/cm²	**AR515HT**	105
333 – 353 nm	R<0.2%	25 mJ/cm²	**AR343HT**	135
515 + 1030 nm	R<0.1%	50 mJ/cm²	**ARD1030HT**	115

Ordering of Coated Thin Lenses

Please choose the coating and add its suffix to the lens code.

Example:

UVFS Thin Plano-Convex Lens, focal length 75 mm, coated AR / AR @ 760-840 nm

Code: **110-1209ET** + **AR**, Price: 80 + 29 EUR= 109 EUR/pc.

Lens code | Coating code | Lens price | Coating price

AR COATED LENS KITS

Large Spherical Lens Kit

Lens kits contain different types of spherical (plano-convex, biconvex, plano-concave, biconcave) or cylindrical (plano-convex, plano-concave) lenses with various focal lengths. Kits are packed into foam lined plastic boxes for safe handling and storage. Kits are available with laser line and broadband multilayer anti-reflection coatings.

Spherical lens kits consist of 40 (large kit) or 15 (small kit) Ø25.4 mm lenses made of UVFS.

Cylindrical lens kits consist of 12 rectangular lenses (25.4 × 50.8 mm) made of UVFS.

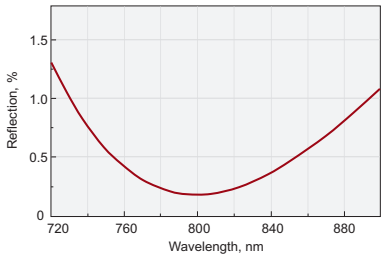
LARGE UV FS SPHERICAL LENS KIT (40 pcs.)

Coating	Catalogue number	Price, EUR
BBAR @ 210 – 400 nm, R<2%	140-1240-AR210-400	3490
BBAR @ 350 – 900 nm, R<1.5%	140-1240-AR350-900	3290
BBAR @ 760 – 840 nm, R<0.4%	140-1240-AR760-840	3040
BBAR @ 700 – 900 nm, R<0.8%	140-1240-AR700-900	3210
BBAR @ 650 – 1100 nm, R<1%	140-1240-AR650-1100	3310
AR @ 266 nm, R<0.4%	140-1240-AR266	3130
AR @ 1030 nm, R<0.25%	140-1240-AR1030	2930
AR @ 515 nm, R<0.25%	140-1240-AR515	2930
AR @ 343 nm, R<0.3%	140-1240-AR343	3030
AR @ 258 nm, R<0.4%	140-1240-AR258	3130

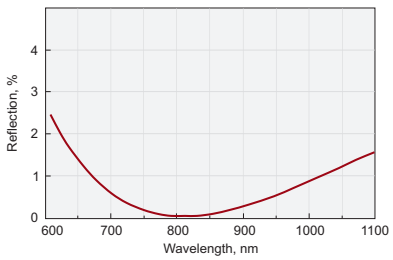
Large UV FS Spherical Lens Kit

Type	Dia, mm	F, mm	Catalogue number
pl/cx	25.4	30	110-1203E
pl/cx	25.4	50	110-1205E
pl/cx	25.4	75	110-1209E
pl/cx	25.4	80	110-1210E
pl/cx	25.4	100	110-1211E
pl/cx	25.4	125	110-1216E
pl/cx	25.4	150	110-1217E
pl/cx	25.4	200	110-1219E
pl/cx	25.4	250	110-1221E
pl/cx	25.4	300	110-1223E
pl/cx	25.4	350	110-1225E
pl/cx	25.4	400	110-1227E
pl/cx	25.4	500	110-1233E
pl/cx	25.4	600	110-1235E
pl/cx	25.4	750	110-1239E
pl/cx	25.4	1000	110-1245E
bi/cx	25.4	25	111-1204E
bi/cx	25.4	40	111-1207E
bi/cx	25.4	50	111-1210E
bi/cx	25.4	75	111-1214E

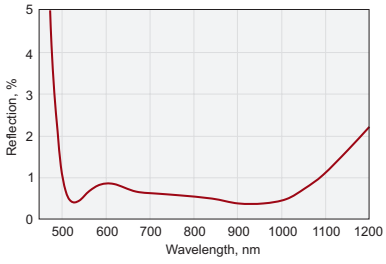
Type	Dia, mm	F, mm	Catalogue number
bi/cx	25.4	100	111-1218E
bi/cx	25.4	150	111-1222E
bi/cx	25.4	200	111-1226E
bi/cx	25.4	250	111-1230E
bi/cx	25.4	300	111-1234E
bi/cx	25.4	400	111-1238E
bi/cx	25.4	500	111-1240E
bi/cx	25.4	1000	111-1260E
pl/cv	25.4	-50	112-1205E
pl/cv	25.4	-75	112-1209E
pl/cv	25.4	-100	112-1211E
pl/cv	25.4	-150	112-1217E
pl/cv	25.4	-200	112-1219E
pl/cv	25.4	-300	112-1223E
bi/cv	25.4	-25	114-1204E
bi/cv	25.4	-50	114-1208E
bi/cv	25.4	-75	114-1212E
bi/cv	25.4	-100	114-1216E
bi/cv	25.4	-150	114-1220E
bi/cv	25.4	-200	114-1224E



R<0.5% @ 760-840 nm, AOI= 0°



R<0.8% @ 700-900 nm, AOI= 0°



R<1.5% @ 500-1100 nm, AOI=0°

SMALL UV FS SPHERICAL LENS KIT (15 pcs.)

Coating	Code	Price, EUR
BBAR @ 210 – 400 nm, R<2%	140-1215-AR210-400	1830
BBAR @ 350 – 900 nm, R<1.5%	140-1215-AR350-900	1660
BBAR @ 760 – 840 nm, R<0.4%	140-1215-AR760-840	1530
BBAR @ 700 – 900 nm, R<0.8%	140-1215-AR700-900	1610
BBAR @ 650 – 1100 nm, R<1%	140-1215-AR650-1100	1670
AR @ 266 nm, R<0.4%	140-1215-AR266	1380
AR @ 1030 nm, R<0.25%	140-1215-AR1030	1320
AR @ 515 nm, R<0.25%	140-1215-AR515	1320
AR @ 343 nm, R<0.3%	140-1215-AR343	1350
AR @ 258 nm, R<0.4%	140-1215-AR258	1380

Small UV FS Spherical Lens Kit

Type	Dia, mm	F, mm	Catalogue number
pl/cx	25.4	30	110-1203E
pl/cx	25.4	50	110-1205E
pl/cx	25.4	75	110-1209E
pl/cx	25.4	100	110-1211E
pl/cx	25.4	125	110-1216E
pl/cx	25.4	150	110-1217E
pl/cx	25.4	200	110-1219E
pl/cx	25.4	300	110-1223E

Type	Dia, mm	F, mm	Catalogue number
pl/cx	25.4	500	110-1233E
pl/cx	25.4	1000	110-1245E
pl/cv	25.4	-50	112-1205E
pl/cv	25.4	-75	112-1209E
pl/cv	25.4	-100	112-1211E
pl/cv	25.4	-125	112-1215E
pl/cv	25.4	-150	112-1217E

UV FS CYLINDRICAL LENS KIT (12 pcs.)

Coating	Catalogue number	Price, EUR
AR @ 210 – 400nm, R<2%	140-0212-ARB300	2720
AR @ 350 – 900nm, R<1.5%	140-0212-ARB625	2630
AR @ 515 + 1030nm, R<0.5%	140-0212-ARD1030	2370
AR @ 700 – 900nm, R<0.5%	140-0212-ARB800	2500
AR @ 650 – 1100nm, R<0.7%	140-0212-ARB825	2550
AR @ 1000 – 1060nm, R<0.3%	140-0212-AR1030	2300
AR @ 515 + 1030nm, R<0.1%	140-0212-ARD1030HT	3300
AR @ 700 – 900nm, R<0.1%	140-0212-ARB800HT	3400
AR @ 900 – 1100nm, R<0.1%	140-0212-ARB1000HT	3400

UV FS Cylindrical Lens Kit

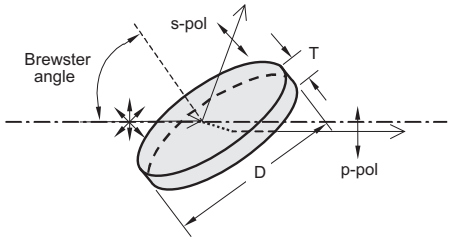
Type	Size, mm	F, mm	Catalogue number
pl/cx	25.4 × 50.8	50	120-1205E
pl/cx	25.4 × 50.8	75	120-1210E
pl/cx	25.4 × 50.8	100	120-1215E
pl/cx	25.4 × 50.8	150	120-1220E
pl/cx	25.4 × 50.8	200	120-1225E
pl/cx	25.4 × 50.8	300	120-1230E

Type	Size, mm	F, mm	Catalogue number
pl/cx	25.4 × 50.8	500	120-1235E
pl/cx	25.4 × 50.8	1000	120-1240E
pl/cv	25.4 × 50.8	-50	122-1205E
pl/cv	25.4 × 50.8	-75	122-1210E
pl/cv	25.4 × 50.8	-100	122-1215E
pl/cv	25.4 × 50.8	-150	122-1220E

THIN FILM POLARIZERS (56° Angle of Incidence)

Thin film polarizers separate s- and p- polarization components. Due to their high laser damage threshold, thin film polarizers can be used as an alternative to Glan-Taylor laser polarizing prisms or cube polarizing beamsplitters.

Femtoline thin film laser polarizers are designed for use in high energy lasers. They can be used for Yb:KYW/KGW or Ti:Sapphire laser fundamental wavelengths or their harmonics, as well as intracavity Q-switch hold-off polarizers. The most efficient way to use these polarizers is at Brewster's angle – 56 ± 2°.



SPECIFICATIONS

Material	BK7, UV FS
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Transmitted wavefront distortion	λ/10 @ 633 nm
Angle of incidence (AOI)	56 ± 2°
Laser damage threshold	>100 mJ/cm², 50 fsec pulse, 50 Hz, 800 nm typical

THIN FILM POLARIZERS WITH HIGH EXTINCTION RATIO

ROUND POLARIZERS. Material – UV FS. Tp > 98%, Ts < 0.1%.
Extinction ratio for transmitted light Tp/Ts: >1000:1

Wavelength, nm	Diameter D, mm	Thickness T, mm	Catalogue number	Price, EUR
343	25.4	3	**420-1242HE**	218
515	25.4	3	**420-1244HE**	185
800	25.4	3	**420-1256HE**	185
780 – 820	25.4	3	**420-1266HE**	275
1030	25.4	3	**420-1248HE**	216

RECTANGULAR POLARIZERS. Material – UV FS. Tp > 98%, Ts < 0.1%.
Extinction ratio for transmitted light Tp/Ts: >1000:1

Wavelength, nm	Rectangular dimensions		Thickness T, mm	Catalogue number	Price, EUR
	Length, mm	Width, mm			
1030	20	15	6	**420-1478HE**	165
1030	30	20	6	**420-1578HE**	220

HIGH TRANSMISSION THIN FILM POLARIZERS

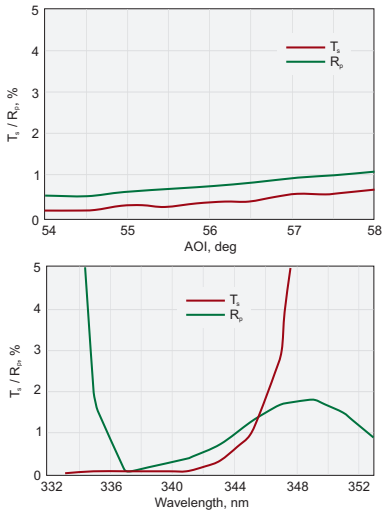
ROUND POLARIZERS. Material – UV FS. Rs / Tp > 99.5 / 99.0%.
Extinction ratio for transmitted light Tp/Ts >200:1

Wavelength, nm	Diameter D, mm	Thickness T, mm	Catalogue number	Price, EUR
343	25.4	3.0	**420-1242HT**	237
515	25.4	3.0	**420-1244HT**	200
800	25.4	3.0	**420-1256HT**	200
1030	25.4	3.0	**420-1248HT**	234

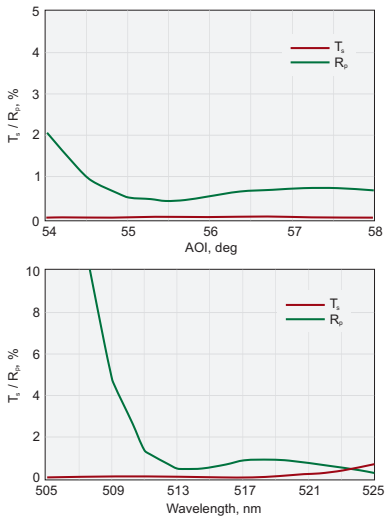
ULTRA HIGH TRANSMISSION THIN FILM POLARIZERS

ROUND POLARIZERS. Material – UV FS. Ts < 0.2%, Rp < 0.2%.
Extinction ratio for transmitted light Tp/Ts >500:1

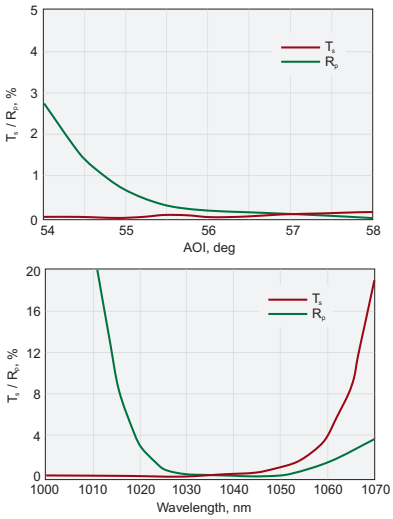
Wavelength, nm	Diameter D, mm	Thickness T, mm	Catalogue number	Price, EUR
800	25.4	3.0	**420-1256UHT**	260
1030	25.4	3.0	**420-1248UHT**	304



420-1242HT.
High Transmission @ 343 nm, Rs/Tp > 99.5/99.0 %, AOI=56°

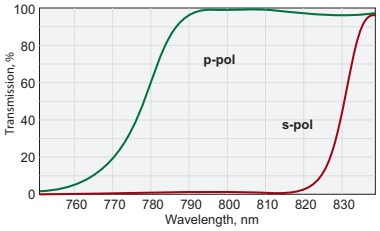


420-1244HT.
High Transmission @ 515 nm, Rs/Tp > 99.5/99.0 %, AOI=56°

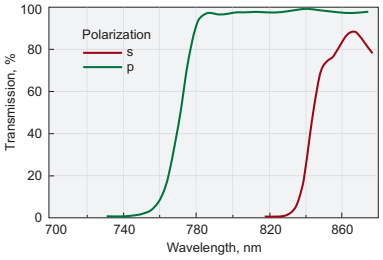


420-1248HT.
High Transmission @ 1030 nm, Rs/Tp > 99.5/99.0 %, AOI=56°

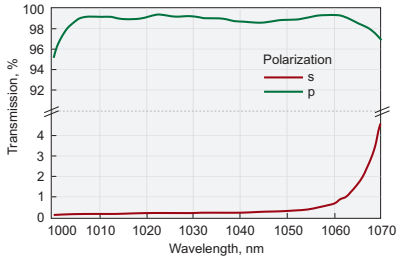
STANDARD THIN FILM POLARIZERS



420-0126E.
Transmission @ 800 nm,
Rs/Tp > 99.5/95.0 %, AOI=56°



420-0266E.
Transmission @ 780-820 nm,
Rs/Tp > 99.5/95.0 %, AOI=56°



420-0268E.
Transmission @ 1010-1050 nm,
Rs/Tp > 99.5/95.0 %, AOI=56°

Please contact us if you need thin film laser polarizers of other wavelengths or other types of substrates.

ROUND POLARIZERS. Material – BK7. Rs / Tp > 99.5 / 95.0%.
Extinction ratio for transmitted light Tp/Ts >200:1

Wavelength, nm	Diameter D, mm	Thickness T, mm	Catalogue number	Price, EUR
515	12.7	3.0	420-0114E	108
800	12.7	3.0	420-0126E	108
780-820	12.7	3.0	420-0136E	160
1030	12.7	3.0	420-0118E	115
1010-1050	12.7	3.0	420-0138E	160
515	25.4	3.0	420-0244E	128
800	25.4	3.0	420-0256E	128
780-820	25.4	3.0	420-0266E	189
1030	25.4	3.0	420-0248E	155
1010-1050	25.4	3.0	420-0268E	189
515	50.8	6.0	420-0514E	206
800	50.8	6.0	420-0506E	215
780-820	50.8	6.0	420-0526E	309
1030	50.8	6.0	420-0518E	255
1010-1050	50.8	6.0	420-0528E	335

RECTANGULAR POLARIZERS. Material – BK7. Rs / Tp > 99.5 / 95.0%.
Extinction ratio for transmitted light Tp/Ts >200:1

Wavelength, nm	Rectangular dimensions		Thickness T, mm	Catalogue number	Price, EUR
	Length, mm	Width, mm			
515	28.6	14.3	3.0	420-0274	142
800	28.6	14.3	3.0	420-0286	142
780-820	28.6	14.3	3.0	420-0296	220
1030	28.6	14.3	3.0	420-0278	170
1010-1050	28.6	14.3	3.0	420-0298	220

ROUND POLARIZERS. Material – UV FS. Rs / Tp > 99.5 / 95.0%.
Extinction ratio for transmitted light Tp/Ts >200:1

Wavelength, nm	Diameter D, mm	Thickness T, mm	Catalogue number	Price, EUR
343	12.7	3.0	420-1112E	164
400	12.7	3.0	420-1123E	131
515	12.7	3.0	420-1114E	131
800	12.7	3.0	420-1126E	131
780-820	12.7	3.0	420-1136E	196
1030	12.7	3.0	420-1118E	145
1010-1050	12.7	3.0	420-1138E	196
343	25.4	3.0	420-1242E	182
400	25.4	3.0	420-1253E	154
515	25.4	3.0	420-1244E	154
800	25.4	3.0	420-1256E	154
780-820	25.4	3.0	420-1266E	231
1030	25.4	3.0	420-1248E	180
1010-1050	25.4	3.0	420-1268E	231
343	50.8	6.0	420-1512E	325
400	50.8	6.0	420-1503E	295
515	50.8	6.0	420-1514E	295
800	50.8	6.0	420-1506E	305
780-820	50.8	6.0	420-1526E	404
1030	50.8	6.0	420-1518E	315
1010-1050	50.8	6.0	420-1528E	404

RECTANGULAR POLARIZERS. Material – UV FS. Rs / Tp > 99.5 / 95.0%.
Extinction ratio for transmitted light Tp/Ts >2 00:1

Wavelength, nm	Rectangular dimensions		Thickness T, mm	Catalogue number	Price, EUR
	Length, mm	Width, mm			
343	28.6	14.3	3.0	420-1272	255
400	28.6	14.3	3.0	420-1283	215
515	28.6	14.3	3.0	420-1274	215
800	28.6	14.3	3.0	420-1286	215
780-820	28.6	14.3	3.0	420-1296	315
1030	28.6	14.3	3.0	420-1278	225
1010-1050	28.6	14.3	3.0	420-1298	315

RELATED PRODUCTS

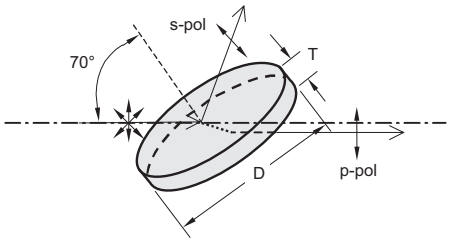
Glan Laser Polarizing, Wollaston Prisms
See page 1.63

Adapters for Polarizer
at 56° 840-0117, 840-0118

Variable Attenuators
for Linearly Polarized
Laser Beam 990-0070
See page 4.29

THIN FILM POLARIZERS (70° Angle of Incidence)

Broadband thin film polarizers separate the s- and p-polarization components in broad region at 70° angle of incidence (AOI). These polarizers are designed to be used in high energy laser systems, typically as extracavity attenuators for femtosecond lasers. Polarizers are made form UV fused silica and feature a high laser damage threshold – up to 50 mJ/cm², 50 fsec pulse, 50 Hz, 800 nm typical.



SPECIFICATIONS

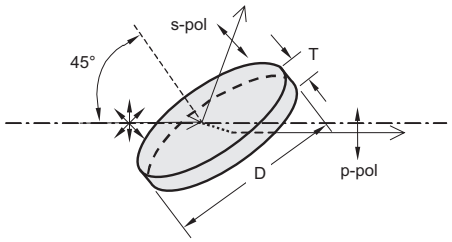
Substrate material	UV FS
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Transmitted wavefront distortion	λ/10 @ 633 nm
Clear aperture	>90% of diameter
Angle of incidence (AOI)	70 ± 2°
Parallelism	<30 arcsec

RECTANGULAR POLARIZERS. Material – UV FS. Rs / Tp > 99.5 / 95.0%.
Extinction ratio for transmitted light Tp/Ts >200:1

Centre wavelength, nm	Operating wavelength region, nm	Rectangular dimensions		Thickness T, mm	Catalogue number	Price, EUR
		Length, mm	Width, mm			
800	750 – 850	60.0	20.0	4.0	**420-1696BBi70**	435
1030	980 – 1080	60.0	20.0	4.0	**420-1698BBi70**	435

THIN FILM POLARIZERS (45° Angle of Incidence)

These thin film polarizers separate or combine the s- and p-polarization components at 45° angle of incidence. They are designed for use in high energy lasers. Polarizers are made from UV FS and feature high laser damage threshold reaching 10 J/cm² at 1064 nm.



SPECIFICATIONS

Substrate material	UV FS
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Transmitted wavefront distortion	λ/10 @ 633 nm
Clear aperture	>90% of diameter
Angle of incidence (AOI)	45 ± 2°
Parallelism	<30 arcsec

TF POLARIZERS WITH HIGH EXTINCTION RATIO

ROUND POLARIZERS. Material – UV FS. Tp > 98%, Ts < 0.1%.
Extinction ratio for transmitted light Tp/Ts: >1000:1

Wavelength, nm	Diameter D, mm	Thickness T, mm	Catalogue number	Price, EUR
343	25.4	3	**420-1242i45HE**	328
515	25.4	3	**420-1244i45HE**	295
1030	25.4	3	**420-1248i45HE**	315
343	50.8	6	**420-1512i45HE**	640
515	50.8	6	**420-1514i45HE**	555
1030	50.8	6	**420-1518i45HE**	620

STANDARD THIN FILM POLARIZERS

ROUND POLARIZERS. Material – UV FS. Rs / Tp > 99.5 / 95.0%.
Extinction ratio for transmitted light Tp/Ts >200:1

Wavelength, nm	Diameter D, mm	Thickness T, mm	Catalogue number	Price, EUR
343	25.4	3	**420-1242i45**	238
515	25.4	3	**420-1244i45**	200
1030	25.4	3	**420-1248i45**	225
343	50.8	6	**420-1512i45**	455
515	50.8	6	**420-1514i45**	395
1030	50.8	6	**420-1518i45**	440

QUARTZ RETARDATION WAVEPLATES

Quartz Retardation Plates are made of material enabling linear birefringence. These plates are made of high quality optical grade crystalline quartz, featuring high damage threshold. Retardation plates rotate polarization's direction (λ/2) or convert linear into circular polarization or vice versa (λ/4). Quartz retardation plates are supplied mounted and AR coated.

ZERO ORDER OPTICALLY CONTACTED WAVEPLATES

FEATURES

- Easily aligned
- Temperature insensitive
- Moderately insensitive to wavelength

Zero order plates are comprised of two different plates cut parallel to their optical axis. This construction makes plates less dependent on temperature. The plates are polished to different thicknesses enabling one to achieve required retardation difference. These component plates have orthogonal optic axis directions, so that the roles of the ordinary and extraordinary rays are interchanged in passing from one plate to another. The thickness of the plate determines the phase shift between the ordinary and extraordinary beams for any specific wavelength.

SPECIFICATIONS

Material	Single crystal quartz
Optical axis	normal to facet on circumference of retarder
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Wavefront distortion	λ/10 @ 633 nm
Parallelism	< 10 arcsec
AR coating	R < 0.5%
Laser damage threshold	> 10 mJ/cm², 50 fsec pulse, 800 nm typical

Ø12.7 mm waveplates. Clear aperture Ø11 mm, unmounted

Center wavelength, nm	AR coating range, nm	Retardation λ/2		Retardation λ/4	
		Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	1000-1060	460-4208D12	165	460-4408D12	165
800	760-840	460-4215D12	165	460-4415D12	165
780	740-820	460-4220D12	165	460-4420D12	165
515	500-530	460-4232D12	165	460-4432D12	165
400	380-420	460-4235D12	165	460-4435D12	165
343	333-353	460-4241D12	175	460-4441D12	175
266	257-275	460-4245D12	185	460-4445D12	185
257	250-265	460-4246D12	185	460-4446D12	185

RELATED PRODUCTS

Achromatic Air-Spaced Waveplates
See page 1.68

Polarizer Holder
840-0180

High Precision Rotation Polarizer, Waveplate Mount 840-0186

Ø20 mm waveplates. Clear aperture Ø17 mm, mounted into Ø25.4 mm ring holder

Center wavelength, nm	AR coating range, nm	Retardation λ/2		Retardation λ/4	
		Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	1000-1060	460-4208	245	460-4408	245
800	760-840	460-4215	245	460-4415	245
780	740-820	460-4220	245	460-4420	245
515	500-530	460-4232	245	460-4432	245
400	380-420	460-4235	245	460-4435	245
343	333-353	460-4241	270	460-4441	270
266	257-275	460-4245	280	460-4445	280
257	250-265	460-4246	280	460-4446	280

ZERO ORDER AIR-SPACED WAVEPLATES

FEATURES

› For high power laser applications

SPECIFICATIONS

Material	Single crystal quartz
Optical axis	normal to facet on circumference of retarder
Clear aperture	Ø17 mm
Ring mount outer diameter	25.4 +0.0 / -0.12 mm
Wavefront distortion	λ/10 @ 633 nm
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Parallelism	< 10 arcsec
AR coating	R < 0.5%
Laser damage threshold	100 mJ/cm², 50 fsec pulse, 800 nm typical

Center wavelength, nm	AR coating range, nm	Retardation λ/2		Retardation λ/4	
		Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	1000-1060	**464-4208**	310	**464-4408**	310
800	760-840	**464-4215**	310	**464-4415**	310
780	740-820	**464-4220**	310	**464-4420**	310
515	500-530	**464-4232**	310	**464-4432**	310
400	380-420	**464-4235**	310	**464-4435**	310
343	333-353	**464-4241**	335	**464-4441**	335
266	257-275	**464-4245**	345	**464-4445**	345
257	250-265	**464-4246**	345	**464-4446**	345

HOUSING ACCESSORIES

Polarizer Holder 840-0180

ZERO ORDER DUAL WAVELENGTH WAVEPLATES

When optical axis is turned by 45 degrees to input polarization, the waveplate rotates polarization of Ti:Sapphire laser fundamental (800 nm) by 90 degrees and the polarization of Ti:Sapphire second harmonic (400 nm) remains the same.

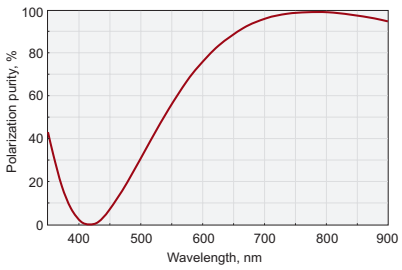
SPECIFICATIONS

Material	Single crystal quartz
Optical axis	normal to facet on circumference of retarder
Clear aperture	Ø17 mm
Ring mount outer diameter	25.4 +0.0/-0.12 mm
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Wavefront distortion	λ/10 @ 633 nm
Parallelism	<10 arcsec
AR coating	R<0.5%

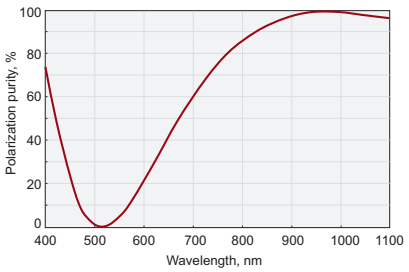
Description	AR coated	Laser Damage Threshold	Application	Catalogue number	Price, EUR
optically contacted λ/2@800 nm + λ@400 nm	800+400 nm	>10 mJ/cm², 50 fsec pulse, 800 nm typical	Ti:Sapphire	**465-4211**	345
air-spaced λ/2@800 nm + λ@400 nm	800+400 nm	100 mJ/cm², 50 fsec pulse, 800 nm typical	Ti:Sapphire	**466-4211**	410
optically contacted λ/2@1030 nm + λ@515 nm	1030+515 nm	>10 mJ/cm², 50 fsec pulse, 1030 nm typical	Yb:KGW/KYW	**465-4212**	345
air-spaced λ/2@1030 nm + λ@515 nm	1030+515 nm	100 mJ/cm², 50 fsec pulse, 1030 nm typical	Yb:KGW/KYW	**466-4212**	410

HOUSING ACCESSORIES

Polarizer Holder 840-0180



Polarization purity of zero order dual waveplate. λ/2@800 nm + λ/400 nm



Polarization purity of zero order dual waveplate. λ/2@1030 nm + λ/515 nm

LOW ORDER WAVEPLATES

FEATURES

› Thinner than multiple order

Low order plates are less temperature sensitive and temperature dependent than multiple order plates. These plates are suitable for high and low power applications.

SPECIFICATIONS

Material	Single crystal quartz
Optical axis	normal to facet on circumference of retarder
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Wavefront distortion	λ/10 @ 633 nm
Parallelism	< 10 arcsec
AR coating	R < 0.5%
Laser damage threshold	100 mJ/cm², 50 fsec pulse, 800 nm typical

RELATED PRODUCTS

Low Order Plates of other wavelengths
See page 1.69

High Precision Rotation Polarizer, Waveplate Mount 840-0186

Ø12.7 mm waveplates. Clear aperture Ø11 mm, unmounted

Wavelength, nm	Retardation λ/2		Retardation λ/4	
	Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	461-4208D12	105	461-4408D12	105
800	461-4215D12	105	461-4415D12	105
780	461-4220D12	105	461-4420D12	105
515	461-4232D12	105	461-4432D12	105

Ø20 mm waveplates. Clear aperture Ø17 mm, mounted into Ø25.4 mm ring holder

Wavelength, nm	Retardation λ/2		Retardation λ/4	
	Catalogue number	Price, EUR	Catalogue number	Price, EUR
1030	461-4208	160	461-4408	160
800	461-4215	160	461-4415	160
780	461-4220	160	461-4420	160
515	461-4232	160	461-4432	160
400	461-4235	160	461-4435	160
343	461-4241	192	461-4441	192

MULTIPLE ORDER DUAL WAVELENGTH WAVEPLATES

SPECIFICATIONS

Material	Single crystal quartz
Optical axis	normal to facet on circumference of retarder
Wavefront distortion	λ/10 @ 633 nm
Clear aperture	Ø17 mm
Ring mount outer diameter	25.4 +0.0 / -0.12 mm
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Parallelism	< 10 arcsec
AR coating	R < 0.5%
Nominal thickness of waveplate	0.2 – 1.2 mm
Laser damage threshold	>100 mJ/cm², 50 fsec pulse, 800 nm typical

RELATED PRODUCTS

Dual Wavelength Plates of other wavelengths
See page 1.71

High Precision Rotation Polarizer, Waveplate Mount 840-0186

Retardation and Wavelength	Catalogue number	Price, EUR
λ @ 800 nm + λ/2 @ 400 nm	463-4121	215
λ @ 800 nm + λ/4 @ 400 nm	463-4141	215
λ/2 @ 800 nm + λ @ 400 nm	463-4211	215
λ/2 @ 800 nm + λ/2 @ 400 nm	463-4221	215
λ/2 @ 800 nm + λ/4 @ 400 nm	463-4241	215
λ/4 @ 800 nm + λ @ 400 nm	463-4411	215
λ/4 @ 800 nm + λ/2 @ 400 nm	463-4421	215
λ/4 @ 800 nm + λ/4 @ 400 nm	463-4441	215

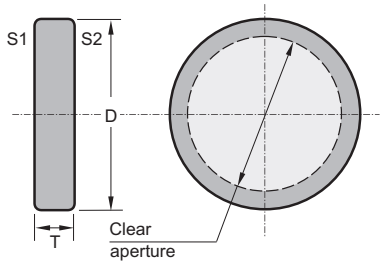
POLARIZATION PLANE ROTATORS

FEATURES

- Made of crystalline quartz
- Intended to rotate a beam polarization plane strictly to an appropriate angle using circular birefringent effect

Compared to a waveplate, a rotator has an intrinsic advantage, being independent of rotation around its own optical axis. It needs no adjustment, only to be installed normal to incident radiation. A polarization plane rotator is normally used for the specific wavelength. It is only slightly dependent on ambient temperature.

Polarization plane rotators for any wavelength from 200 to 2300 nm are available.



SPECIFICATIONS

Material	Single crystal quartz
Optical axis	Normal to faces S1, S2 of rotator
Clear aperture	Ø17 mm
Ring mount outer diameter	25.4 +0.0/-0.12 mm
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Wavefront distortion	λ/10 @ 633 nm
Parallelism	< 10 arcsec
AR coating	R < 0.5%
Laser damage threshold	100 mJ/cm^2, 50 fsec pulse, 800 nm typical

Center wavelength, nm	Rotation angle of polarization plane, deg	AR coating range, nm	Catalogue number	Price, EUR
1030	45	1000-1060	**470-4904**	215
1030	90	1000-1060	**470-4909**	215
800	45	760-840	**470-4804**	195
800	90	760-840	**470-4809**	195
780	45	740-820	**470-4784**	195
780	90	740-820	**470-4789**	195
515	45	500-530	**470-4514**	195
515	90	500-530	**470-4519**	195
400	45	380-420	**470-4044**	195
400	90	380-420	**470-4049**	195
343	45	333-353	**470-4344**	195
343	90	333-353	**470-4349**	195
266	45	257-275	**470-4264**	245
266	90	257-275	**470-4269**	245
257	45	250-265	**470-4254**	245
257	90	250-265	**470-4259**	245

RELATED PRODUCTS

Polarization plane rotators of other wavelengths
See page 1.72

Kinematic Mirror and Beamsplitter Mount 840-0020

Kinematic Positioning Mount 840-0193

GROUP VELOCITY DELAY COMPENSATION PLATES

Compensation plates are made of calcite. Plates are available with different orientation for different Group Velocity Delay compensation – starting from tens of femtosecond up to tens of picosecond delay compensation.

Standard GVD compensation plates are adjusted for required compensation by angular tuning changing the angle of incidence.

Suggested AOI is -5 to +5 deg, however they also can operate at larger AOI. Standard plates are made of 16×14 mm aperture, clear aperture Ø12 mm and mounted in to 1″ ring holder. The optical axis is at special orientation – non parallel to faces of plate.

AR coatings for custom wavelengths are also available. Standard GVP compensation plates have clear aperture Ø12 mm. However, on special requests clear apertures up to 20 mm diameter can be produced.

SPECIFICATIONS

Material	Natural Calcite
Clear aperture	Ø12 mm
Ring mount outer diameter	25.4 +0.0 / -0.12 mm
Surface quality	40 – 20 scratch & dig (MIL-PRF-13830B)
Wavefront distortion	λ/4@ 633 nm
Parallelism	<3 arc min
AR coating	R<0.5% 760-840 nm and R<1% at 380-420 nm

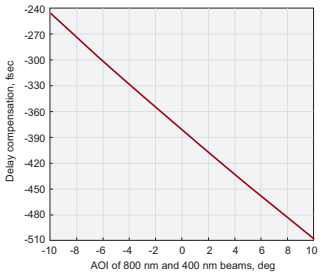
Group velocity delay between 800 nm and 400 nm pulses in compensation plates at different angle of incidence.
400 nm pulse („e“ pol) is faster than 800 nm pulse („o“ pol).

STANDARD CALCITE PLATES

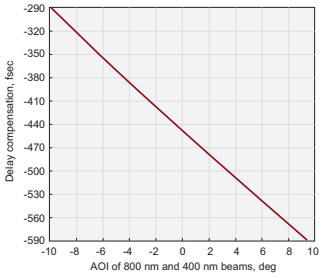
for delay compensation between 800 nm ("o" polarization) and 400 nm ("e" polarization) pulses

Delay compensation range*	Coatings	Catalogue number	Price, EUR
310 – 450 fsec	BBAR @ 800+400 nm	225-2113	470
370 – 520 fsec	BBAR @ 800+400 nm	225-2114	470
410 – 580 fsec	BBAR @ 800+400 nm	225-2111	470
440 – 630 fsec	BBAR @ 800+400 nm	225-2115	470

**GVD compensation range at Angle Of Incidence from -5° to +5°.*



225-2113.



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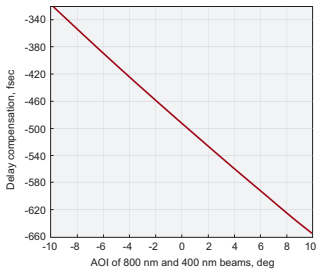

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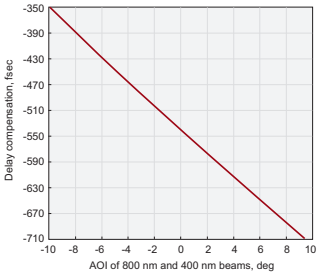


225-2115.

RELATED PRODUCTS

Thin BBO Crystals for SHG and THG of Ti:Sapphire laser wavelengths
See pages 4.35

Femtokits for THG of Femtosecond Ti:Sapphire Lasers
See page 4.38

Positioning Mount 840-0199 for Nonlinear Crystal Housing
See page 2.27

CRYSTAL WINDOWS FOR WHITE LIGHT (CONTINUUM) GENERATION

The interaction of intense laser pulses with transparent media (the crystals with cubic structure are more effective) can result in vast spectral broadening, ranging from the infrared to the ultraviolet spectral region. This continuum or white-light generation is a well-established phenomenon. Femtosecond laser induced white light has been the source of ultrashort coherent radiation for numerous applications: time-resolved broadband pump–probe spectroscopy, optical pulse compression, and optical parametric amplification.

SPECIFICATIONS

Material	undoped YAG, orientation [111]
Clear aperture	>90% of diameter
Diameter tolerance	+0.00 / -0.13 mm
Thickness tolerance	±0.2 mm
Surface quality	20 – 10 scratch & dig
Transmitted wavefront distortion	λ/4 – λ/10 @ 633 nm
Parallelism	<30 arcsec
Coating	uncoated

STANDARD YAG WINDOWS

Material	Diameter, mm	Thickness, mm	Transmitted wavefront distortion	Catalogue number	Price, EUR
YAG	12.7	1.0	λ/4	555-7121	185
YAG	12.7	2.0	λ/4	555-7122	185
YAG	12.7	3.0	λ/10	555-7123	195
YAG	12.7	4.0	λ/10	555-7124	195
YAG	12.7	6.0	λ/10	555-7126	215
YAG	12.7	8.0	λ/10	555-7128	230
YAG	25.4	1.0	λ/4	555-7251	225
YAG	25.4	2.0	λ/4	555-7252	225
YAG	25.4	3.0	λ/10	555-7253	245
YAG	25.4	4.0	λ/10	555-7254	245

SPECIFICATIONS

Material	sapphire, orientation c-cut [111]
Clear aperture	>90% of diameter
Diameter tolerance	+0.00 / -0.13 mm
Thickness tolerance	±0.2 mm
Surface quality	60 – 40 scratch & dig
Transmitted wavefront distortion	<1 λ @ 633 nm
Parallelism	<3 arcmin
Coating	uncoated

STANDARD SAPPHIRE WINDOWS

Material	Diameter, mm	Thickness, mm	Transmitted wavefront distortion	Catalogue number	Price, EUR
Sapphire	12.7	0.5	1 λ	550-7120	26
Sapphire	12.7	1.0	1 λ	550-7121	25
Sapphire	12.7	2.0	1 λ	550-7122	25
Sapphire	12.7	3.0	1 λ	550-7123	25
Sapphire	12.7	4.0	1 λ	550-7124	27
Sapphire	12.7	5.0	1 λ	550-7125	29
Sapphire	12.7	6.0	1 λ	550-7126	30
Sapphire	12.7	8.0	1 λ	550-7128	50
Sapphire	20.0	0.5	1 λ	550-7200	35
Sapphire	20.0	1.0	1 λ	550-7201	35
Sapphire	20.0	1.5	1 λ	550-7215	35
Sapphire	20.0	2.0	1 λ	550-7202	35
Sapphire	25.4	0.5	1 λ	550-7250	45
Sapphire	25.4	1.0	1 λ	550-7251	45
Sapphire	25.4	2.0	1 λ	550-7252	45
Sapphire	25.4	3.0	1 λ	550-7253	45
Sapphire	25.4	4.0	1 λ	550-7254	45
Sapphire	25.4	5.0	1 λ	550-7255	50
Sapphire	25.4	6.0	1 λ	550-7256	70
Sapphire	25.4	8.0	1 λ	550-7258	80

SPECIFICATIONS

Material	single crystal CaF_2, orientation [001]
Clear aperture	>90% of diameter
Diameter tolerance	+0.00 / -0.13 mm
Thickness tolerance	±0.2 mm
Surface quality	40 – 20 scratch & dig
Transmitted wavefront distortion	λ/4 – λ/10 @ 633 nm
Parallelism	<1 arcmin
Coating	uncoated

STANDARD CaF_2 WINDOWS

Material	Diameter, mm	Thickness, mm	Transmitted wavefront distortion	Catalogue number	Price, EUR
CaF_2	12.7	3.0	λ/6	531-5123	120
CaF_2	12.7	4.0	λ/8	531-5124	140
CaF_2	25.4	1.0	λ/4	531-5251	160
CaF_2	25.4	2.0	λ/4	531-5252	160
CaF_2	25.4	3.0	λ/4	531-5253	160
CaF_2	25.4	4.0	λ/10	531-5254	180
CaF_2	25.4	5.0	λ/10	531-5255	180

VARIABLE ATTENUATOR FOR FEMTOSECOND LINEARLY POLARIZED LASER BEAM 990-0070

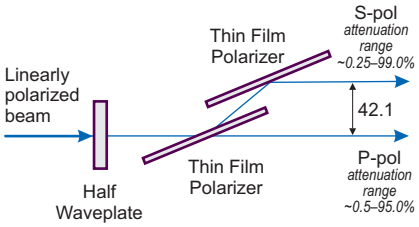
FEATURES

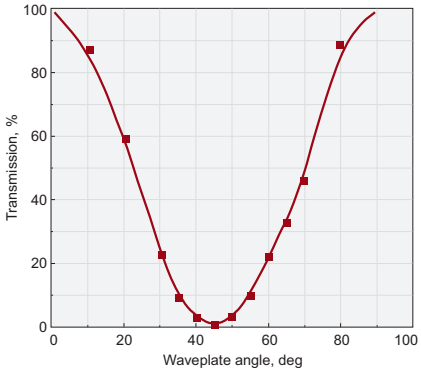
- Divides laser beam into two parallel beams of manually adjustable intensity ratio
- Large dynamic range
- Transmitted beam shift ~ 0.5 mm
- High Optical damage threshold
- Weight – 0.35 kg

*Note: Movable base **820-0090**, Rod Holder **820-0050-02** and standard rod should be ordered seperately.*

This variable attenuator/beamsplitter consists of special design opto-mechanical Adapter and precision opto-mechanical Holder 840-0197. Two Thin Film Brewster type polarizers, which reflect s-polarized light while transmitting p-polarized light, are housed into Adapter. Quartz Half Waveplates are housed in rotating holder 840-0197.

The intensity ratio of those two beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place. The holder 840-0197 allows to adjust Angle Of Incidence of the Thin Film Brewster type polarizers by ±2° and to get the maximum polarization contrast.





SPECIFICATIONS

Aperture diameter	17 mm
Damage threshold	>10 mJ/cm², 50 fs pulse at 800 nm, typical
for high power laser applications	>100 mJ/cm², 50 fs pulse at 800 nm, typical
Time dispersion	t<4 fs for 100 fs Ti:Sapphire laser pulses
Polarization Contrast (after 1st polarizer)	>1:200
Polarization Contrast (after 2nd polarizer)	>1:500

Wavelength, nm	Catalogue number	Price, EUR
257	990-0070-257	945
266	990-0070-266	945
343	990-0070-343	840
400	990-0070-400	740
390-410	990-0070-400B	890
515	990-0070-515	740
505-525	990-0070-515B	890
800	990-0070-800	740
780-820	990-0070-800B	890
1030	990-0070-1030	740
1010-1050	990-0070-1030B	890

Zero order optically contacted half waveplate is housed in rotating holder for high power femtosecond applications (Laser damage threshold: >10 mJ/cm², 50 fs pulse at 800 nm, typical).

FOR HIGH POWER LASER APPLICATIONS

Wavelength, nm	Catalogue number	Price, EUR
257	990-0070-257H	1020
266	990-0070-266H	1020
343	990-0070-343H	915
400	990-0070-400H	815
390-410	990-0070-400HB	965
515	990-0070-515H	815
505-525	990-0070-515HB	965
800	990-0070-800H	815
780-820	990-0070-800HB	965
1030	990-0070-1030H	815
1010-1050	990-0070-1030HB	965

Zero Order Air-Spaced half waveplate is housed in rotating holder for high power femtosecond applications (Laser damage threshold: >100 mJ/cm², 50 fs pulse at 800 nm, typical).

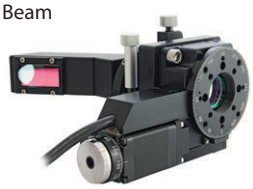
RELATED PRODUCTS

Femtoline Zero Order Optically Contacted/Air-Spaced Plates
See page 4.23

Femtoline Thin Film Laser Polarizers
See page 4.20

Neutral Density Filters
See page 1.14

Motorized Variable Attenuator for Linearly Polarized Laser Beam 990-0070M
See page 5.15



Beam dumps 990-0800, 990-0820
See page 5.22

BROADBAND VARIABLE ATTENUATOR FOR FEMTOSECOND LASER PULSES 990-0070HBBI70

FEATURES

- Divides laser beam into two parallel beams of manually adjustable intensity ratio
- Large dynamic range
- Transmitted beam shift ~ 2.6 mm
- High optical damage threshold

990-0070-800HBBi70

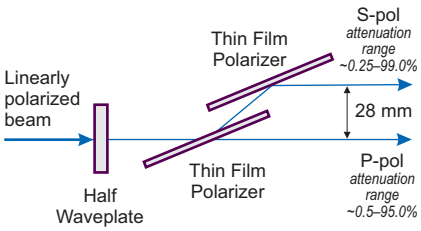
990-0070-800HBBi70M

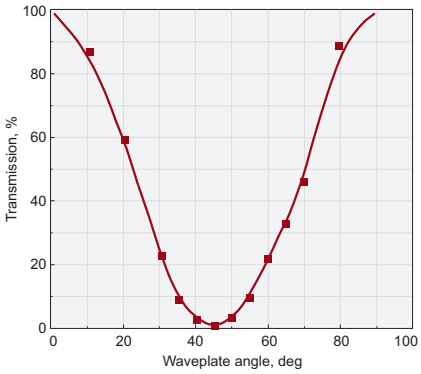
This variable attenuator/beamsplitter consists of a special design opto-mechanical adapter and a precision opto-mechanical holder 840-0197. Two thin film polarizers, operating at AOI=70° and reflecting s-polarized light while transmitting p-polarized light, are housed into the adapter. A quartz zero order air-spaced half waveplate is housed into the rotating holder 840-0197.

The intensity ratio of outgoing two parallel beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of the exit beam or outgoing beams intensity ratio can be controlled over a wide dynamic range.

P-polarized beam is transmitted straightly with a 2.6 mm shift and s-polarized beam (after 2 reflections) is parallel to the outgoing p-polarized beam, just separated by 28 mm.

The 840-0197 holder allows to adjust angle of incidence of the thin film polarizers by ±2° and to achieve the maximum polarization contrast.





SPECIFICATIONS

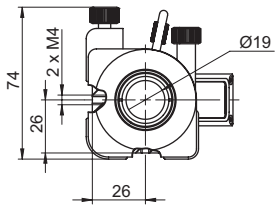
Aperture diameter	12 mm
Operating bandwidth	100 nm
Damage treshold	50 mJ/cm^2 pulsed at 800 nm, 50 fsec, 50 Hz
Polarization contrast (after 1st polarizer)	>1:200
Polarization contrast (after 2nd polarizer)	>1:500

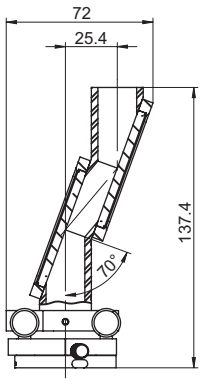
MANUAL ATTENUATORS

Wavelength, nm	Catalogue number	Price, EUR
750-850	990-0070-800HBBi70	1270
980-1080	990-0070-1030HBBi70	1270

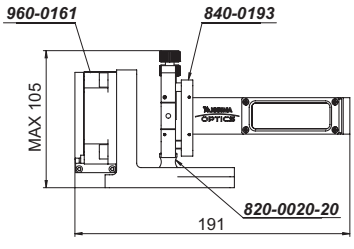
MOTORIZED ATTENUATORS

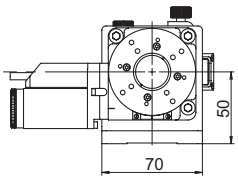
Wavelength, nm	Catalogue number	Price, EUR
750-850	990-0070-800HBBi70M	2050
980-1080	990-0070-1030HBBi70M	2050





990-0070-800HBBi70





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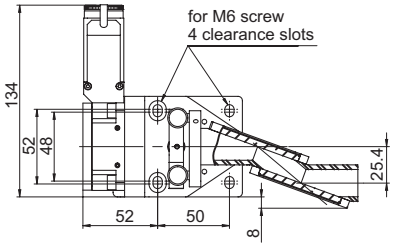


RELATED PRODUCTS

Neutral Density Filters
See page 1.14

Femtoline Zero Order Optically Contacted / Air-Spaced Plates
See page 4.23

Femtoline Thin Film Laser Polarizers
See page 4.20

VARIABLE ATTENUATOR FOR FEMTOSECOND LINEARLY POLARIZED LASER BEAM 990-0071

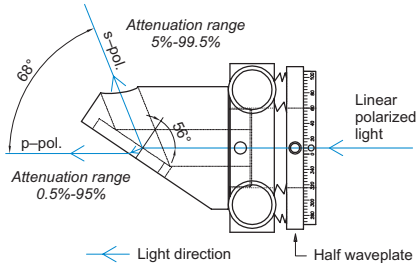
FEATURES

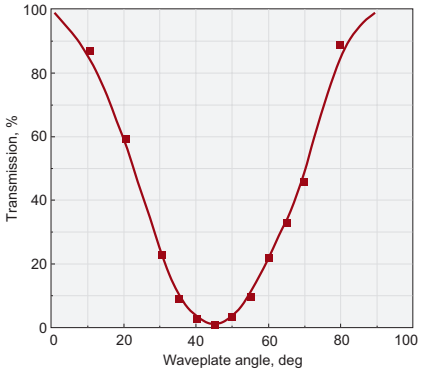
- Divides laser beam into two beams of manually adjustable intensity ratio separated by 68° angle
- Large dynamic range
- Transmitted beam shift ~0.5 mm
- High Optical damage threshold
- Weight – 0.25 kg

*Note: Solid Base Height Extender **820-0210** and Standard Rod **820-0020-20** should be ordered separately*

This variable attenuator/beamsplitter consists of special design opto-mechanical adapter for polarizer at 56° 840-0117A or 840-0118A and precision opto-mechanical holder 840-0197. Thin Film Brewster type polarizer, which reflect s-polarized light at 56° while transmitting p-polarized light, is housed into adapter for polarizer at 56°. Quartz Half Waveplates are housed in rotating holder 840-0197.

The intensity ratio of those two beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place. The holder 840-0197 allows to adjust Angle Of Incidence of the Thin Film Brewster type polarizer by ±2° and to get the maximum polarization contrast.





SPECIFICATIONS

Aperture diameter	10 mm
Damage threshold	>10 mJ/cm², 50 fs pulse at 800 nm, typical
for high power laser applications	>100 mJ/cm², 50 fs pulse, 800 nm typical
Time dispersion	t<4 fs for 100 fs Ti:Sapphire laser pulses
Polarization Contrast	>1:200

Wavelength, nm	Catalogue number	Price, EUR
257	990-0071-257	625
266	990-0071-266	625
343	990-0071-343	600
400	990-0071-400	550
390-410	990-0071-400B	650
515	990-0071-515	550
505-525	990-0071-515B	650
800	990-0071-800	550
780-820	990-0071-800B	650
1030	990-0071-1030	550
1010-1050	990-0071-1030B	650

Zero order optically contacted half waveplate is housed in rotating holder 840-0197 (laser damage threshold: >10 mJ/cm², 50 fs pulse at 800 nm, typical).

FOR HIGH POWER LASER APPLICATIONS

Wavelength, nm	Catalogue number	Price, EUR
257	990-0071-257H	690
266	990-0071-266H	690
343	990-0071-343H	665
400	990-0071-400H	615
390-410	990-0071-400HB	715
515	990-0071-515H	615
505-525	990-0071-515HB	715
800	990-0071-800H	615
780-820	990-0071-800HB	715
1030	990-0071-1030H	615
1010-1050	990-0071-1030HB	715

Zero Order Air-Spaced half waveplate is housed in rotating holder 840-0197 (laser damage threshold: >100 mJ/cm², 50 fs pulse at 800 nm, typical).

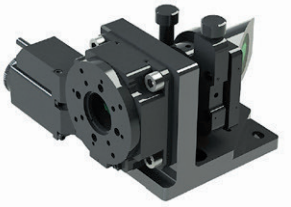
RELATED PRODUCTS

Neutral Density Filters
See page 1.14

Femtoline Zero Order Optically Contacted / Air-Spaced Plates
See page 4.23

Femtoline Thin Film Laser Polarizers
See page 4.20

Motorized Variable Attenuator for Linearly Polarized Laser Beam 990-0071M
See page 5.18



VARIABLE ATTENUATOR FOR FEMTOSECOND LASER PULSES 990-0072

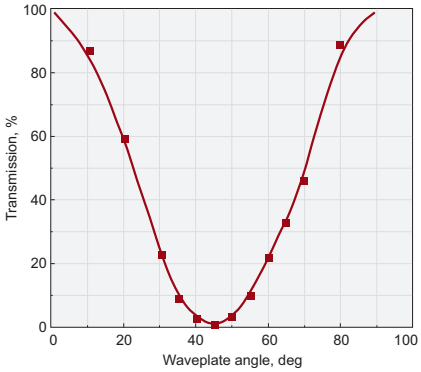
FEATURES

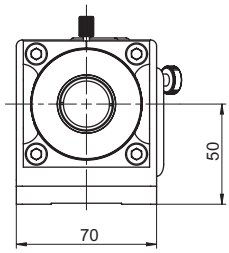
- Divides laser beam into two beams of manually adjustable intensity ratio separated by 68° angle
- Large dynamic range
- Trasmitted beam shift ~1 mm
- High optical damage threshold
- Motorized version 990-0072M available online

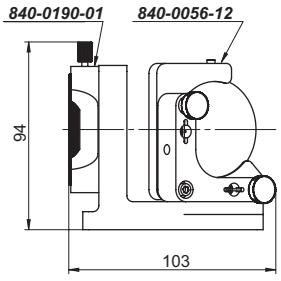
This variable attenuator/beamsplitter consists of Polarizer Holder 840-0190-01 and Kinematic Mirror/Beamsplitter Mount 840-0056-12. UVFS Thin Film Brewster type polarizer diameter 50.8 mm, which reflect s-polarized light while transmitting p-polarized light, is housed into Beamsplitter Mount 840-0056-12. A quartz Zero Order (optically contacted) Half Waveplate diameter 25.4 mm (for femtosecond applications) or Zero Order Air-Spaced Half Waveplate (for high power applications) is housed in rotating polarizer holder 840-0190-01 and placed in the incident linearly polarized laser beam.

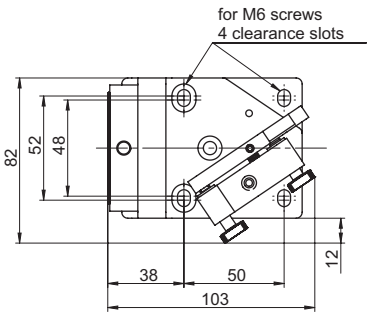
The intensity ratio of those two separted and different polarized beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place.

The holder 840-0056-12 allows to adjust Angle Of Incidence of the Thin Film Brewster type polarizers by ±4.5° and to get the maximum extinction contrast. The mounts are on rods, rod holders and Movable Base 820-0090. The optical axis height from the table top can be adjusted in the range 78-88mm. Other height can be offered as custom changing the standard rods and rod holders into higher.









SPECIFICATIONS

Clear Aperture diameter	22 mm
Damage threshold	>10 mJ/cm², 50 fs pulse at 800 nm, typical
for high power applications	>100 mJ/cm², 50 fs pulse at 800 nm, typical
Polarization Contrast	>1:200
Transmitted beam shift	~ 1 mm
Weight	0.45 kg

Wavelength, nm	Catalogue number	Price, EUR
266	990-0072-266	950
343	990-0072-343	895
400	990-0072-400	865
515	990-0072-515	865
800	990-0072-800	880
780-820	990-0072-800B	980
1030	990-0072-1030	890
1010-1050	990-0072-1030B	980

A quartz Zero Order (optically contacted) Half Waveplate Ø25.4 mm is housed in rotating holder 840-0190-01.

FOR HIGH POWER LASER APPLICATIONS

Wavelength, nm	Catalogue number	Price, EUR
266	990-0072-266H	1085
343	990-0072-343H	1030
400	990-0072-400H	1000
515	990-0072-515H	1000
800	990-0072-800H	1015
780-820	990-0072-800HB	1115
1030	990-0072-1030H	1025
1010-1050	990-0072-1030HB	1115

A quartz Zero Order Air-Spaced Half Waveplate clear aperture Ø22mm is housed in rotating holder 840-0190-01.

RELATED PRODUCTS

Neutral Density Filters
See page 1.14

Femtoline Thin Film Laser Polarizers
See page 4.20

Femtoline Zero Order Optically Contacted / Air-Spaced Plates
See page 4.23

Motorized Variable Attenuator for Linearly Polarized Laser Beam 990-0072M
Find more at EksmaOptics.com

VARIABLE ATTENUATOR FOR FEMTOSECOND LASER PULSES 990-0073

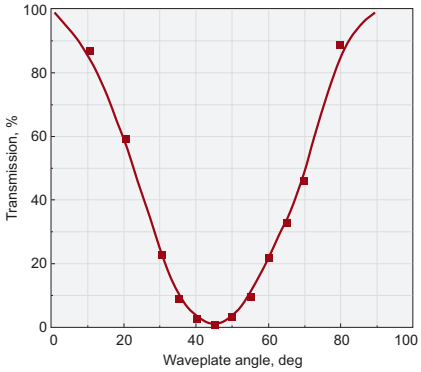
FEATURES

- Divides laser beam into two beams of manually adjustable intensity ratio separated by 68° angle
- Large dynamic range
- Trasmitted beam shift ~1.4 mm
- High optical damage threshold

This variable attenuator/beamsplitter consists of Polarizer Holder 840-0180-A2 and Kinematic Mirror/Beamsplitter Mount 840-0056-13. UVFS Thin Film Brewster type polarizer Ø76.2 mm, which reflect s-polarized light while transmitting p-polarized light, is housed into Beamsplitter Mount 840-0056-13. A quartz Zero Order (optically contacted) Half Waveplate Ø40 mm or Zero Order Air-Spaced Half Waveplate Ø40 mm is housed in rotating polarizer holder 840-0180-A2 and placed in the incident linearly polarized laser beam.

The intensity ratio of those two separated and different polarized beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place.

The holder 840-0056-13 allows to adjust Angle Of Incidence of the Thin Film Brewster type polarizers by ±4.5° and to get the maximum extinction contrast. The mounts are on rods, rod holders and Movable Base 820-0090. The optical axis height from the table top can be adjusted in the range 92-98 mm. Other height can be offered as custom changing the standard rods and rod holders into higher.



SPECIFICATIONS

Clear Aperture diameter	36 mm
Damage threshold	>10 mJ/cm², 50 fs pulse at 800 nm, typical
for high power applications	>100 mJ/cm², 50 fs pulse at 800 nm, typical
Polarization Contrast	>1:200
Transmitted beam shift	~ 1.4 mm
Weight	0.6 kg

Wavelength, nm	Catalogue number	Price, EUR
266	990-0073-266	1690
343	990-0073-343	1560
400	990-0073-400	1540
515	990-0073-515	1540
800	990-0073-800	1560
780-820	990-0073-800B	1790
1030	990-0073-1030	1615
1010-1050	990-0073-1030B	1850

A quartz Zero Order (optically contacted) Half Waveplate Ø40 mm is housed in rotating holder 840-0180-A2.

FOR HIGH POWER LASER APPLICATIONS

Wavelength, nm	Catalogue number	Price, EUR
266	990-0073-266H	1790
343	990-0073-343H	1660
400	990-0073-400H	1640
515	990-0073-515H	1640
800	990-0073-800H	1660
780-820	990-0073-800HB	1890
1030	990-0073-1030H	1715
1010-1050	990-0073-1030HB	1950

A quartz Zero Order Air-Spaced Half Waveplate Ø40 mm is housed in rotating holder 840-0180-A2.