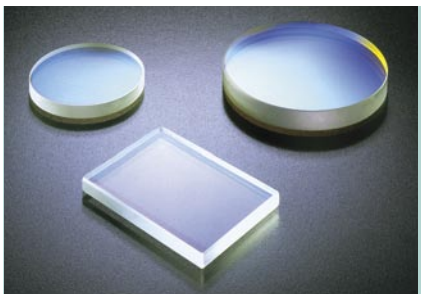


Windows

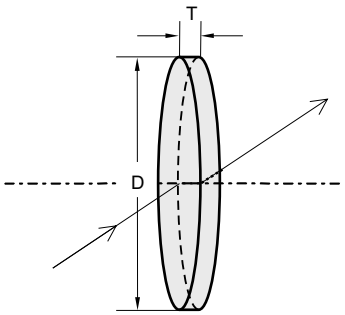
WINDOWS

- **Have high transmittance, low wavefront distortion and low scatter**
- **Are durable and strong**
- **BK7 glass is an economical and ideal choice for high-quality visible applications**
- **FS is the most physically robust and has the lowest coefficient of thermal expansion**
- **UV FS has the deepest UV range and the highest transmittance**

Windows are used to allow optical radiation to pass from one environment to another without allowing other components of these environments to mix. Considerations in selecting windows may include transmission, scattering, wavefront distortion and resistance to certain environments. An ideal window allows an optical beam to pass from one medium to the next without changing the wavelength distribution of the beam, the transmitted wavefront or scatter any of the light out of the beam. We offer windows made from three different materials, from which you may choose in view of the properties you need: BK7, fused silica and UV grade fused silica.

Windows can be anti-reflection coated.
For a required coating, please refer to the Coatings section.
Diameters of up to 250 mm are available on request.

Only homogeneous and inclusion free materials are used.



SPECIFICATIONS

Material	BK7, FS, UV FS
Surface quality	60–40 scratch & dig
Clear aperture	80% of the diameter
Diameter tolerance	+0.00 -0.12 mm
Thickness tolerance	±0.2 mm
Surface flatness	1 λ per inch @ 633 nm
Parallelism	2 arcmin

If you don't see the exact size or shape of a window you need, please let us know. A wide variety of other shapes and sizes can be supplied upon request.

Catalogue number			Diameter D, mm		Thickness T, mm	Price, EUR
BK7	UV FS	FS	Metric	English		BK7 / UV FS / FS
210-0103	210-1103	210-3103	12.5	12.7	3.0	10 / 19 / 17
210-0203	210-1203	210-3203	25.0	25.4	3.0	16 / 26 / 24
210-0403	210-1403	210-3403	40.0	38.1	3.0	24 / 41 / 37
210-0503	210-1503	210-3503	50.0	50.8	3.0	29 / 49 / 47

Please add code M to the catalogue number for metric dimensions and code E for English.

HOUSING ACCESSORIES

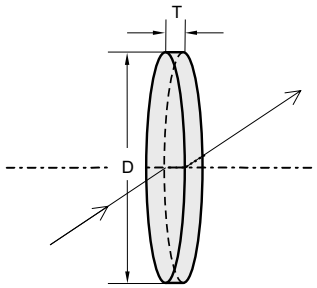
- Kinematic Mirror and Beamsplitter Mount 840-0020
See page 5.51

PRECISION WINDOWS

- **Manufactured from the high quality FS, UV FS and BK7**
- **Precision polished on both surfaces and held parallel to 3 arcsec**

These windows are designed to be used in precision optical systems. The optical transmission is high with little distortion of the transmitted signal. λ/10 transmitted wavefront distortion is usually preferred but λ/4 is offered as an option when this is not an issue.

Windows can be anti-reflection coated. For required coating, please refer to the Coatings section.
Diameters of up to 250 mm are available on request.



SPECIFICATIONS

Material	BK7, FS, UV FS
Surface quality	20–10 scratch & dig
Clear aperture	90% of the diameter
Diameter tolerance	+0.00 -0.12 mm
Thickness tolerance	±0.2 mm
Surface flatness	λ/4 or λ/10 @ 633 nm
Parallelism	30 arcsec or 3 arcsec

Please refer to the UV and IR Optics section for windows made from other materials: LiF, ZnSe, Ge, Sapphire, etc.

Catalogue number			Diameter D, mm		Thickness T, mm	Flatness	Parallelism	Price, EUR
BK7	UV FS	FS	Metric	English				BK7 / UV FS / FS
220-0101	220-1101	220-3101	12.5	12.7	3.0	λ/10	30 arcsec	28 / 53 / 51
220-0201	220-1201	220-3201	25.0	25.4	6.0	λ/10	30 arcsec	39 / 79 / 74
220-0402	220-1402	220-3402	40.0	38.1	8.0	λ/10	30 arcsec	51 / 122 / 109
220-0502	220-1502	220-3502	50.0	50.8	10.0	λ/10	30 arcsec	65 / 160 / 130
220-0103	220-1103	220-3103	12.5	12.7	3.0	λ/10	3 arcsec	44 / 62 / 58
220-0203	220-1203	220-3203	25.0	25.4	6.0	λ/10	3 arcsec	69 / 94 / 91
220-0403	220-1403	220-3403	40.0	38.1	10.0	λ/10	3 arcsec	89 / 139 / 125
220-0503	220-1503	220-3503	50.0	50.8	12.0	λ/10	3 arcsec	119 / 185 / 156
220-0104	220-1104	220-3104	12.5	12.7	3.0	λ/4	30 arcsec	25 / 43 / 40
220-0204	220-1204	220-3204	25.0	25.4	6.0	λ/4	30 arcsec	28 / 61 / 61
220-0405	220-1405	220-3405	40.0	38.1	8.0	λ/4	30 arcsec	41 / 98 / 93
220-0505	220-1505	220-3505	50.0	50.8	10.0	λ /4	30 arcsec	52 / 128 / 117

Please add code M to the catalogue number for metric dimensions and code E for English.

HOUSING ACCESSORIES

- Kinematic Mirror and Beamsplitter Mount 840-0030
See page 5.51

Nd:YAG LaserLine

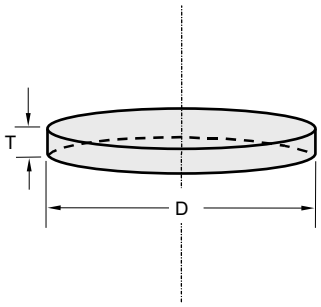
- We offer AR Coated Precision Windows for Nd:YAG laser applications
See page 3.10

OPTICAL FLATS

- **Flatness of reference surface λ/20**

Optical flats are used for testing and evaluating other optical elements. An interference pattern is formed in the air between the flat and object being evaluated, and this pattern is usually more easily seen through the flat than through the object. The pattern consists of alternating bright and dark bands or fringes which are a contour map of the thickness of the air film. If the surface of the optic is significantly flatter than the surface being evaluated, it is correct to interpret the interference pattern directly as a contour map of the surface being evaluated. If the flat is used on the top of the object, and the interference pattern viewed through the flat, it is advantageous to have an anti-reflection coating on the top surface of the flat (the surface which does not touch the object being evaluated).

For an appropriate AR coating, please refer to the Coatings section.



Catalogue number FS	Diameter D, mm Metric	Diameter D, mm English	Thickness T, mm	Price, EUR
230-3208	25.0	25.4	8.0	112
230-3410	40.0	38.1	10.0	149

For metric dimensions please add to catalogue number code M, for English – code E.

SPECIFICATIONS

Material		FS
Diameter tolerance		+0.00 -0.12 mm
Thickness tolerance		±0.2 mm
Surface flatness:	1st surface	λ/20 @ 633 nm
	2nd surface	2 λ @ 633 nm

NEUTRAL DENSITY ABSORPTION TYPE FILTERS

Neutral density absorption type filters decrease the intensity of light without altering the relative spectral distribution of energy. They are used to filter the entire visible spectrum evenly, allowing light reduction without influencing the colour or contrast. Attenuation is accomplished by using light-absorbing glass.

SPECIFICATIONS

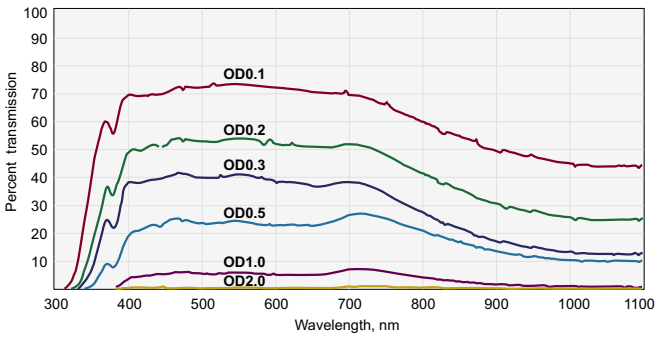
Material	Neutral density colour glass
Surface quality	60-40 scr/dig
Surface flatness	1λ per inch @ 633 nm
Parallelism	3 arcmin
Diameter tolerance	+0.0, -0.2 mm
Clear aperture	90% of the diameter
Design wavelength	450-650 nm
Optical density tolerance	+/-5% of density

HOUSING ACCESSORIES

- Filter Holder 840-0060
  See page 5.59

RELATED PRODUCTS

- Variable Wheel Attenuator 990-0604
  See page 5.163



External transmission curves (include reflections from uncoated surfaces)

Optical Density	Internal Transmittance, % @ 633 nm	Code Ø25.4 mm	Code 25.4x25.4 mm	Code Ø50.8 mm	Code 50.8x50.8 mm	Price, EUR Ø25.4 / 25.4x25.4 / / Ø50.8 / 50.8x50.8
0.1	80	240-2501	240-2601	240-5001	240-5601	35 / 34 / 56 / 55
0.2	63	240-2502	240-2602	240-5002	240-5602	35 / 34 / 56 / 55
0.3	50	240-2503	240-2603	240-5003	240-5603	35 / 34 / 56 / 55
0.5	32	240-2505	240-2605	240-5005	240-5605	35 / 34 / 56 / 55
1.0	10	240-2510	240-2610	240-5010	240-5610	35 / 34 / 56 / 55
2.0	1.0	240-2520	240-2620	240-5020	240-5620	36 / 35 / 57 / 56
3.0	0.1	240-2530	240-2630	240-5030	240-5630	37 / 36 / 58 / 57