

Photonchina's windows are used to isolate different physical environments while allowing light to pass. When selecting windows you should consider materials, transmission, scattering, wavefront distortion, parallelism and resistance to certain environments.

We offer a wide range of different materials and different degree of precision windows. Special materials are available upon requirement.

A broad range of single layer or multilayer antireflective coatings on optical windows are available.

## N-BK7 Optical Windows

N-BK7, or H-K9L Chinese equivalent, is an excellent optical glass material for most visible and near infrared applications. It is the most common borosilicate crown optical glass, and it provides great performance at a good value. Its high homogeneity, low bubble and inclusion content, and straightforward manufacturability make it a good choice for transmissive optics.

Our laser grade optical windows have excellent < 30 arc-seconds parallelism leading to minimal transmitted beam deviation. The windows are available with broadband AR coatings on both sides for use in visible or IR applications.

- Laser-grade, suitable for the most demanding applications
- $\leq \lambda/20$  surface flatness and 10-5 scratch-dig
- Parallel to less than 30 arc sec for minimal transmitted beam deviation
- High quality Grade A N-BK7 or H-K9L.
- Broadband AR coatings for visible, or NIR applications

### PHOTONCHINA BK7 WINDOWS CAPABILITY

ATTRIBUTE	STANDARD	PREMIUM
MATERIAL	BK7 grade A optical glass	
DIAMETER TOLERANCE	+0.0, -0.2mm	+0.0, -0.1mm
THICKNESS TOLERANCE	±0.1mm	±0.01mm
CLEAR APERTURE	>90%	>90%
PARALLELISM	<1 arc minute	<10 arc seconds
SURFACE QUALITY	40-20 scratch and dig	20-10 scratch and dig
WAVEFRONT DISTORTION	$\lambda/4$ per 25mm @ 632.8nm	$\lambda/20$ per 25mm @ 632.8nm
PROTECTIVE BEVEL	0.1 - 0.5mm	0.05 - 0.2mm

## UV Fused Silica Optical Windows

UV Fused Silica Windows feature low distortion, excellent parallelism, low bulk scattering and fine surface quality. This makes them perfectly suited for a wide variety of demanding applications, including multiphoton imaging systems and intracavity laser applications.

- Extremely low bulk scatter and autofluorescence
- Available in high flatness  $\lambda/20$  or general purpose  $\lambda/10$
- <30 arc-second parallelism
- Fine, low scatter surface up to 10-5 scratch-dig
- Broadband AR coatings for UV, visible or IR applications

### PHOTONCHINA FUSED SILICA WINDOWS CAPABILITY

ATTRIBUTE	STANDARD	PREMIUM
MATERIAL	UV grade Fused Silica	UV grade Fused Silica
DIAMETER TOLERANCE	+0.0, -0.2mm	+0.0, -0.1mm
THICKNESS TOLERANCE	±0.1mm	±0.01mm
CLEAR APERTURE	>90%	>90%
PARALLELISM	<1 arc minute	<10 arc seconds
SURFACE QUALITY	40-20 scratch and dig	20-10 scratch and dig
WAVEFRONT DISTORTION	$\lambda/4$ per 25mm @ 632.8nm	$\lambda/20$ per 25mm @ 632.8nm
PROTECTIVE BEVEL	0.1 - 0.5mm	0.05 - 0.2mm

## Calcium Fluoride Optical Windows

Calcium Fluoride optical windows are transparent from 180 nm to 8  $\mu\text{m}$ , making them ideal for applications such as spectroscopy or fluorescence imaging in the UV, visible, and IR wavelengths.

- Ideal for excimer laser applications
- Low absorption and high damage threshold
- Transparent in UV, Visible, and IR
- <1 arc-minute parallelism
- Low chromatic aberration compared to other IR materials

#### PHOTONCHINA CALCIUM FLUORIDE WINDOWS CAPABILITY

ATTRIBUTE	STANDARD	PREMIUM
<b>CALCIUM FLUORIDE</b>	Transmission Range: 170-7800nm  Refractive Index: 1.399@ 5000nm  Little Hygroscopic Susceptibility  High Thermal Expansion Coefficient:  18.85 x 10 <sup>-6</sup> K	It is applicable for wide range spectrum, and it is particularly useful for excimer (exciplex) laser application.

## Sapphire Optical Windows

Uncoated Sapphire windows are ideal for harsh conditions, including environments subject to high temperatures, high pressures, strong vacuum, or corrosive atmospheres. Sapphire has high compressive strength and is resistant to attack from strong acid.

- Ideal for high temperature, high pressure, or strong vacuum environments
- Highly corrosion resistant
- Transparent from 170 nm to 5.5 μm
- Extremely hard and more durable than standard optical glass

For sapphire properties knowledge, please see our Sapphire.



## Wedged Windows

Photonchina high-energy laser wedge windows are specially designed to eliminate losses in vacuum cell applications and can be used as vacuum windows, convection barriers, or interferometer compensator plates.

- Damage resistant up to 10 J/cm<sup>2</sup>
- UV fused silica for excellent thermal stability
- Low wavefront distortion
- Hard refractory coatings
- 25.4, 50.8mm and other custom diameters

### PHOTONCHINA WEDGE WINDOWS CAPABILITY

ATTRIBUTE	PREMIUM
MATERIAL	UV grade Fused Silica
DIAMETER TOLERANCE	+0.0, -0.1mm
WEDGE	30±15 arc min
CLEAR APERTURE	>90%
PARALLELISM	<10 arc seconds
SURFACE QUALITY	20-10 scratch and dig
WAVEFRONT DISTORTION	λ/10 per 25mm @ 632.8nm
CHAMFER	45° ±15°

## Brewster Windows

When oriented at Brewster's angle ( $55.57^\circ$ ), s-polarized light is partially reflected, p-polarized light is transmitted without loss. When placed inside a laser cavity Brewster windows cause p-polarized light to have higher effective gain, resulting in the laser's final output being strongly p-polarized.

Photonchina Brewster windows are made of UV grade fused silica with laser grade surface quality and parallelism, making them ideal polarizers for use inside a laser cavity.

- Ideal for Laser Cavities
- p-polarized light transmitted without loss
- $\lambda/10$  transmitted wavefront distortion
- 10-5 Scratch-Dig

### PHOTONCHINA BREWSTER WINDOWS CAPABILITY

ATTRIBUTE	PREMIUM
MATERIAL	UV grade Fused Silica
SIZE TOLERANCE	+0.0, -0.1mm
WAVELENGTH RANGE	195-2100 nm
CLEAR APERTURE	>90%
PARALLELISM	<10 arc seconds
SURFACE QUALITY	10-5 scratch and dig
WAVEFRONT DISTORTION	$\lambda/10$ per 25mm @ 632.8nm
COATING	UNCOATED OR UPON REQUEST

Other types of optical windows, custom sizes, variations in optical coating request are all available upon request.

Please contact our sales engineer with [sales@photonchinaa.com](mailto:sales@photonchinaa.com), who will respond to your inquiry in time.