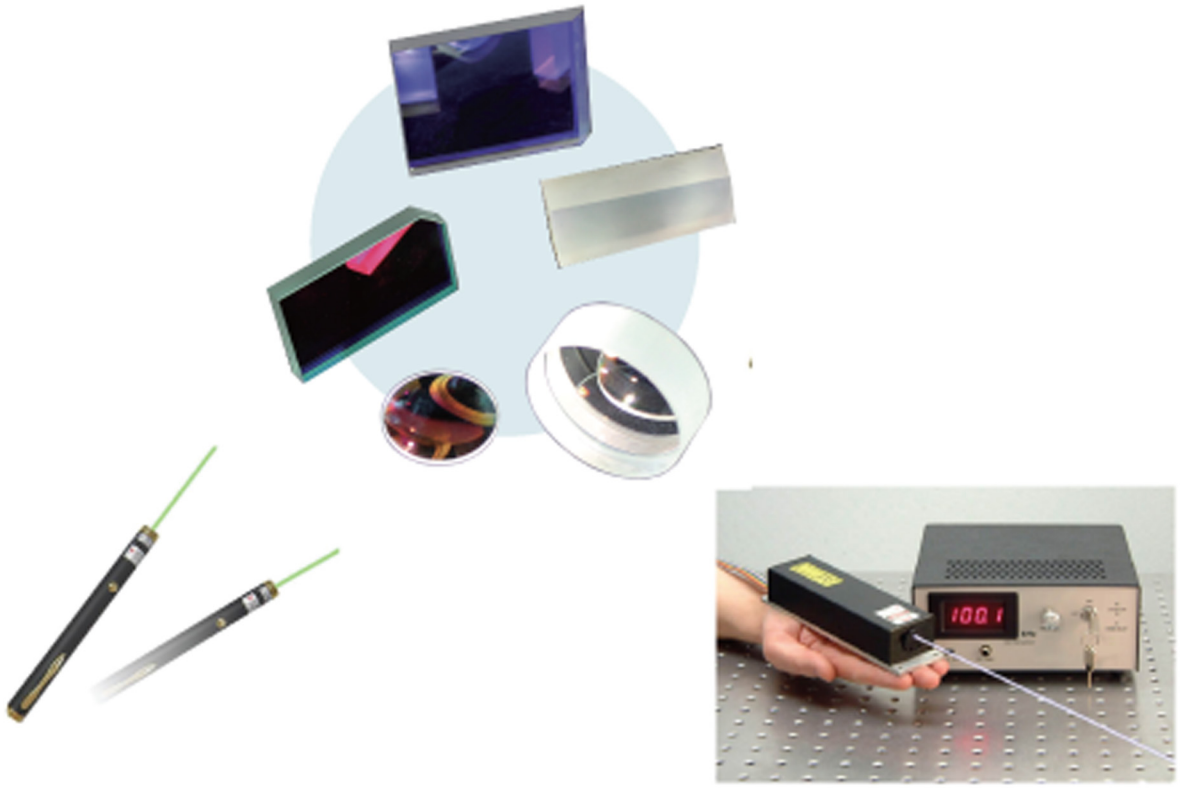
Laser Optics

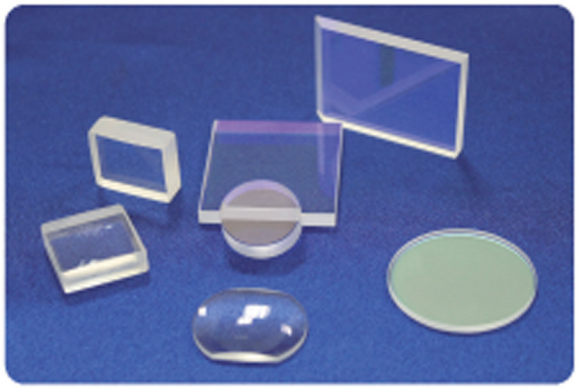


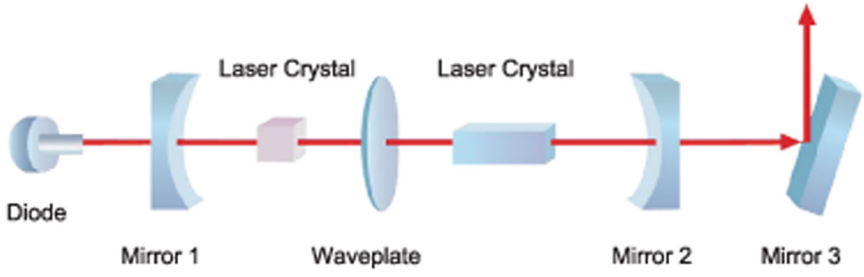
Foreal supplies customers with many types of high efficiency Laser Optics using precision polishing and IBS hard coating technology.

Typical Products and Applications

Main Application	Typical Products	Typical Laser Wavelength (nm)
YAG Laser	Laser Mirror	
DPSS Laser (R, G, B)	Laser Windows	
Q-Switch, Acousto-Optic Devices	Thin Film Plate Polarizer	355, 473, 532
Semiconductor Laser	High Index Beamsplitter	671, 808, 946
Fiber Laser	Laser Prism	1064, 1310, 1550, 1570
OPO Laser System	Scanning Mirror	
Laser Marking	Acousto-Optic Devices	

Laser Mirror





Key Features

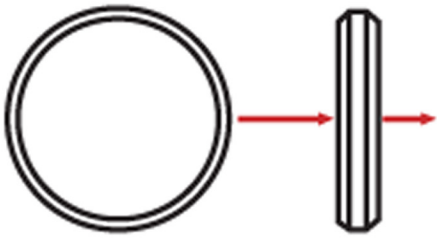
- High Transmission
- High Reflection
- High Damage Threshold
- Excellent Film Density
- Excellent Environmental Stability

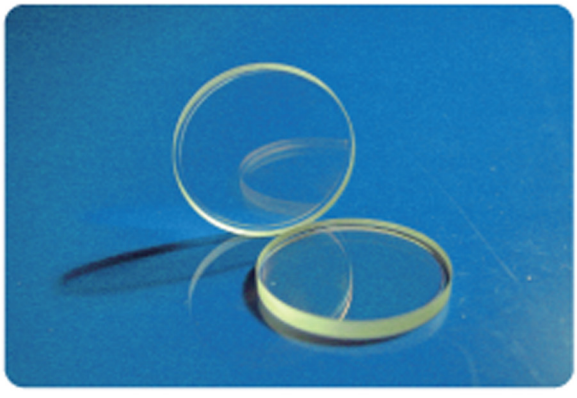
Typical Specifications

Dimension	4mm - 80mm, round or square
Material	BK7 or Fused Silica
Surface Quality	10/5
Surface Flatness	λ/10@632.8nm
Parallelism	30"
Roughness	3 Angstrom

Wavelength Type	Typical Wavelength (nm)	Coating Capability	Main Application
UV	351, 355	R>99.8%	Laser Welding
Visible	457, 473, 532, 633, 671	R>99.9%	Laser Engraving
IR	914, 1064, 1123, 1310, 1342, 1550	R>99.9%	Laser Marking Stage Laser

Laser Windows





Key Features

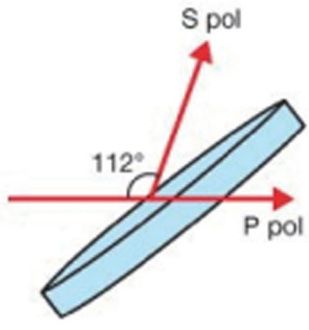
- High Transmission
- High Damage Threshold
- Low Scatter
- Low Absorption
- Excellent Film Density
- Excellent Environmental Stability

Typical Specifications

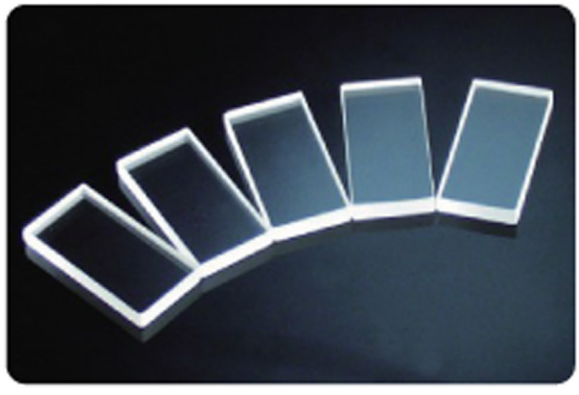
Material	BK7 or Fused Silica
Dimension	4mm - 80mm, round or square
Surface Quality	10/5
Surface Flatness	λ/10@632.8nm
Parallelism	30"
Roughness	3 Angstrom

Typical Wavelength (nm)	Coating Capability	Main Application
532, 785, 808, 1064	R<0.2%	Laser, Aesthetic

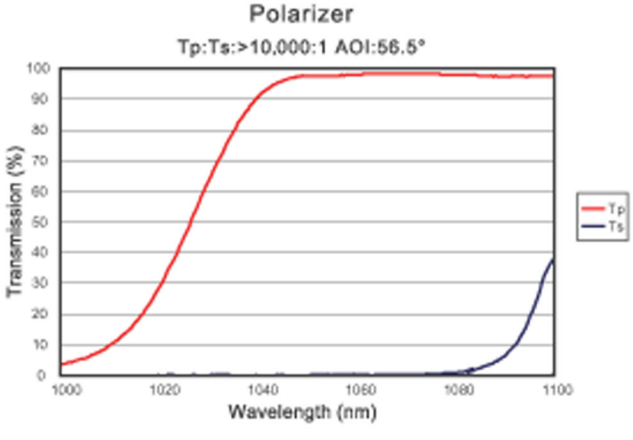
Thin Film Plate Polarizer



AOI of Brewster Angle



Typical Spectrum

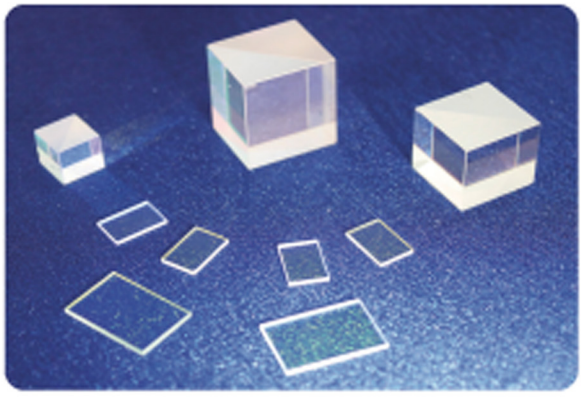


Typical Specifications

Material	BK7 or Fused Silica
Dimension	4mm - 80mm, round or square
Surface Quality	10/5
Surface Flatness	λ/10@632.8nm
Parallelism	30"
Extinction Ratio (Tp/Ts)	200:1 - 10,000:1
Angle of Incidence (AOI)	56.5deg or 45deg (or custom design)
Damage Threshold	10J/cm^2, 10nm pulse @1064nm
Typical Wavelength	1064nm, 532nm (or custom design)
Transmitted Wavefront Error	λ/8@632.8nm

Foreal Spectrum

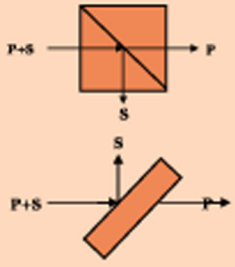
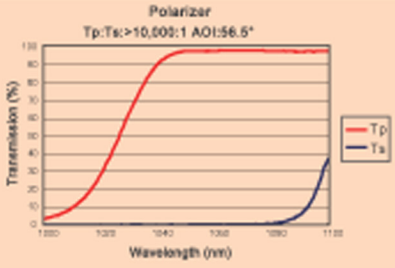
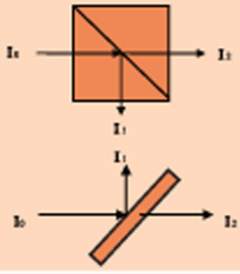
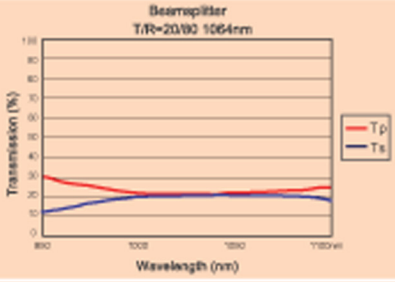
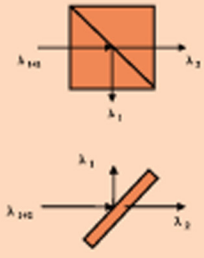
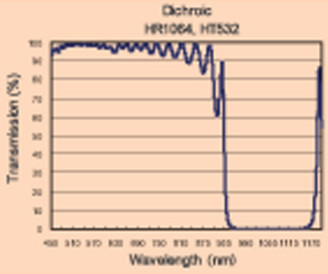
High Index Beamsplitter



Key Features

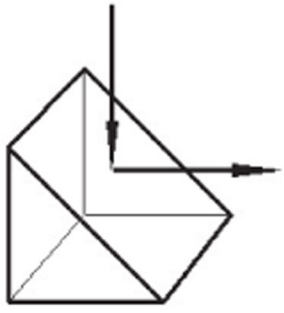
- High Damage Threshold
- Excellent Film Density
- Excellent Environmental Stability

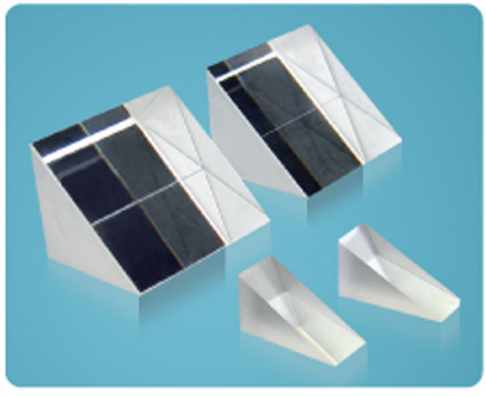
Typical Specifications

Typical Products	Diagram	Typical Coating	Typical Spectrum
Laser Line Polarizing Beamsplitter Cube / Plate		Tp:Ts>200:1 Tp:Ts>500:1 Tp:Ts>1,000:1 Tp:Ts>10,000:1	
Laser Line Non-Polarizing Beamsplitter Cube / Plate		T/R=20/80 T/R=30/70 T/R=40/60 T/R=50/50 Tolerance: ±1%	
Dichroic Cube / Plate		Tavg>90% Ravg>99% AOI:45°	

* Custom specifications available

Laser Prism





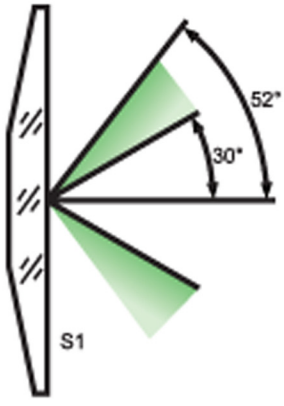
Key Features

- High Precision Processing
- Excellent Film Performance
- High Damage Threshold
- Excellent Environmental Stability

Processing Capability

Material	BK7 or Fused Silica
Dimension	4mm - 80mm (Right Angle Side)
Angle Tolerance	+/-5deg
Surface Quality	10/5
Surface Flatness	λ/8@632.8nm
Bevel	0.25mm x 45deg

Scanning Mirror



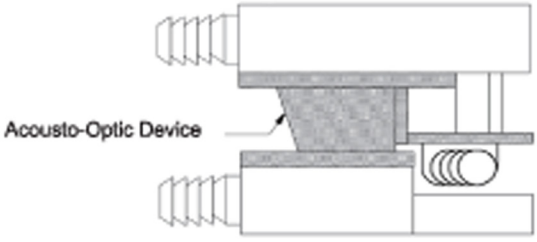
Key Features

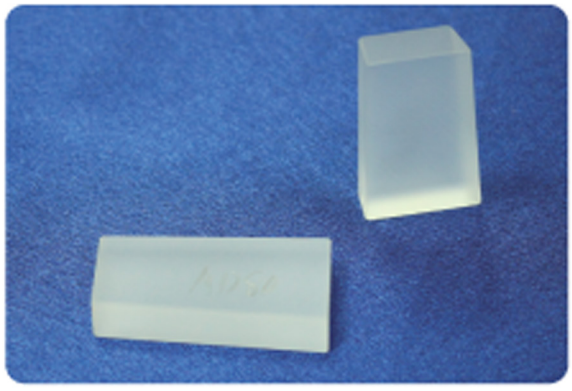
- High Reflection
- High Damage Threshold
- High Durability
- Excellent Environmental Stability

Typical Specification

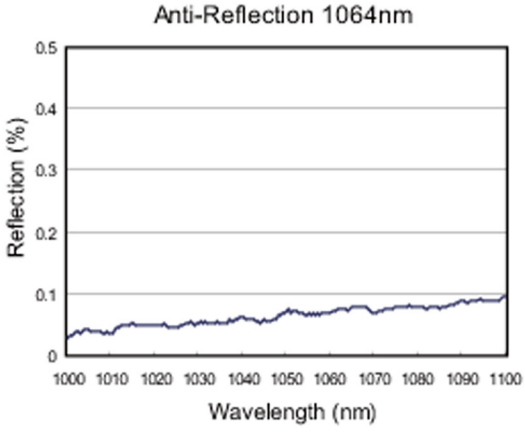
Material	BK7 or Fused Silica
Surface Quality	40/20
Surface Flatness	λ/4@632.8nm
Angle of Incidence (AOI)	45 +/- 11deg
Bevel	0.3mm x 45deg

Acousto-Optic Devices





Typical Spectrum



Typical Specifications

Specification	Fused Silica	Quartz
Surface Quality	10/5	20/10
Surface Flatness	λ/4@632.8nm	λ/2@632.8nm
Roughness	3 Angstrom	5 Angstrom
Typical Spectrum	Anti-Reflection 1064nm (R<0.1%)	