



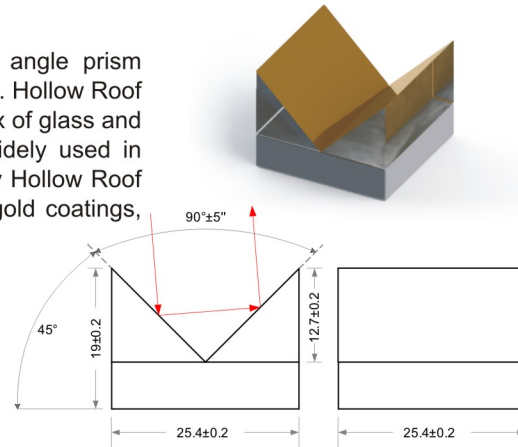
## Hollow Roof Prism Mirror

Hollow Roof Prism Mirror is constructed by two first surface right angle prism mirrors, the dihedral angle between two mirror surfaces is  $90^\circ \pm 5\text{arcsec}$ . Hollow Roof Prism Mirror is insensitive to chromatic dispersion of the refractive index of glass and the absorptive of glass, due to the optical path is in air, so it is widely used in interferometry and also building optical delay lines. Union Optic supply Hollow Roof Prism Mirror with different metal coatings, like aluminum, silver and gold coatings, dielectric coating is also available upon request.

- Hollow Design, No Chromatic Aberration & Material Absorption
- Dihedral Angle  $90^\circ \pm 5\text{arcsec}$
- $<\lambda/4@633\text{nm}$  Reflected Wavefront Distortion
- Aluminum, Silver, Gold & Dielectric Coating Available

### Specifications

|                     |                                                          |
|---------------------|----------------------------------------------------------|
| Dimension Tolerance | $\pm 0.2\text{mm}$                                       |
| Surface Quality     | 40/20 scratch and dig                                    |
| Clear Aperture      | $>90\%$                                                  |
| Flatness            | $<\lambda/4@632.8\text{nm}$                              |
| Dihedral Angle      | $90^\circ \pm 5\text{Arc Second}$                        |
| Coating             | Aluminum, Silver, Gold, Dielectric coatings upon request |
| Damage Threshold    | $>1\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm           |



Standard Product-Hollow Roof Prism Mirror

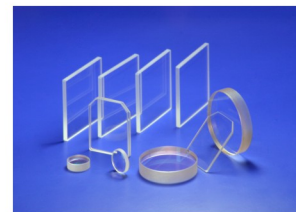
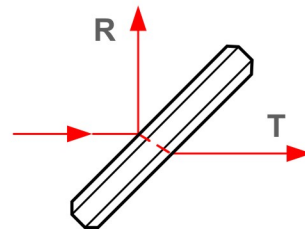
| Part No.    | Material | Dimension(mm) | Height(mm) | Angle Tolerance    | Coating           |
|-------------|----------|---------------|------------|--------------------|-------------------|
| HRM0025-MAL | Bk7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Aluminum          |
| HRM0025-EAL | BK7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Enhanced Aluminum |
| HRM0025-MAG | BK7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Silver            |
| HRM0025-MAU | BK7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Gold              |

## Beamsplitter

### Beamsplitter Plate

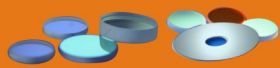
#### Specifications

|                           |                                                |
|---------------------------|------------------------------------------------|
| Dimension Tolerance       | $\pm 0/-0.2\text{mm}$                          |
| Thickness Tolerance       | $\pm 0.2\text{mm}$                             |
| Surface Quality           | 60/40                                          |
| Clear Aperture            | $>90\%$                                        |
| Flatness                  | $<\lambda/4@632.8\text{nm}$ per 25mm           |
| Parallelism               | $<1$ arc minute                                |
| Chamfer                   | Protected $<0.5\text{mm} \times 45^\circ$      |
| T/R                       | $\pm 5\%$ , $T=(T_s+T_p)/2$ , $R=(R_s+R_p)/2$  |
| Coating(AOI= $45^\circ$ ) | S1: Partial reflectance coating S2: AR coating |
| Damage Threshold          | $>1\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm |



### Standard Product-Round Beamsplitter Plate

| Part No.                 |                          |                          | Material | T/R             | Wavelength(nm) | AOI( $^\circ$ ) | Polarization |
|--------------------------|--------------------------|--------------------------|----------|-----------------|----------------|-----------------|--------------|
| $\Phi 12.7*3.0\text{mm}$ | $\Phi 25.4*3.0\text{mm}$ | $\Phi 50.8*3.0\text{mm}$ |          |                 |                |                 |              |
| BSP0112-4R2              | BSP0125-4R2              | BSP0150-4R2              | BK7      | 20:80 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-4R3              | BSP0125-4R3              | BSP0150-4R3              | BK7      | 30:70 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-4R4              | BSP0125-4R4              | BSP0150-4R4              | BK7      | 40:60 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-4R               | BSP0125-4R               | BSP0150-4R               | BK7      | 50:50 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-4R6              | BSP0125-4R6              | BSP0150-4R6              | BK7      | 60:40 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-4R7              | BSP0125-4R7              | BSP0150-4R7              | BK7      | 70:30 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-4R8              | BSP0125-4R8              | BSP0150-4R8              | BK7      | 80:20 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-6R2              | BSP0125-6R2              | BSP0150-6R2              | BK7      | 20:80 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-6R3              | BSP0125-6R3              | BSP0150-6R3              | BK7      | 30:70 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-6R4              | BSP0125-6R4              | BSP0150-6R4              | BK7      | 40:60 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-6R               | BSP0125-6R               | BSP0150-6R               | BK7      | 50:50 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-6R6              | BSP0125-6R6              | BSP0150-6R6              | BK7      | 60:40 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-6R7              | BSP0125-6R7              | BSP0150-6R7              | BK7      | 70:30 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-6R8              | BSP0125-6R8              | BSP0150-6R8              | BK7      | 80:20 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-9R2              | BSP0125-9R2              | BSP0150-9R2              | BK7      | 20:80 $\pm 5\%$ | 900-1200       | 45              | Avg          |
| BSP0112-9R3              | BSP0125-9R3              | BSP0150-9R3              | BK7      | 30:70 $\pm 5\%$ | 900-1200       | 45              | Avg          |
| BSP0112-9R4              | BSP0125-9R4              | BSP0150-9R4              | BK7      | 40:60 $\pm 5\%$ | 900-1200       | 45              | Avg          |
| BSP0112-9R               | BSP0125-9R               | BSP0150-9R               | BK7      | 50:50 $\pm 5\%$ | 900-1200       | 45              | Avg          |
| BSP0112-9R6              | BSP0125-9R6              | BSP0150-9R6              | BK7      | 60:40 $\pm 5\%$ | 900-1200       | 45              | Avg          |
| BSP0112-9R7              | BSP0125-9R7              | BSP0150-9R7              | BK7      | 70:30 $\pm 5\%$ | 900-1200       | 45              | Avg          |
| BSP0112-9R8              | BSP0125-9R8              | BSP0150-9R8              | BK7      | 80:20 $\pm 5\%$ | 900-1200       | 45              | Avg          |



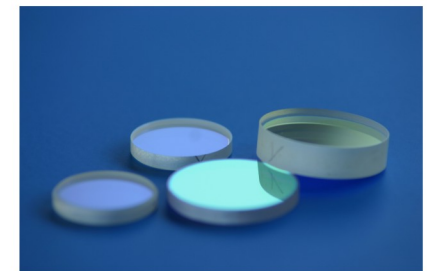
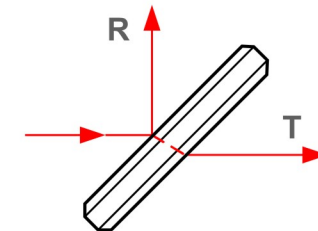
### Standard Product-Retangular Beamsplitter Plate

| Part No.                 |                          |                          | Material | T/R             | Wavelength(nm) | AOI( $^\circ$ ) | Polarization |
|--------------------------|--------------------------|--------------------------|----------|-----------------|----------------|-----------------|--------------|
| $12.7*12.7*3.0\text{mm}$ | $25.4*25.4*3.0\text{mm}$ | $50.8*50.8*3.0\text{mm}$ |          |                 |                |                 |              |
| BSP0112-4S               | BSP0125-4S               | BSP0150-4S               | BK7      | 50:50 $\pm 5\%$ | 400-700        | 45              | Avg          |
| BSP0112-6S               | BSP0125-6S               | BSP0150-6S               | BK7      | 50:50 $\pm 5\%$ | 650-900        | 45              | Avg          |
| BSP0112-9S               | BSP0125-9S               | BSP0150-9S               | BK7      | 50:50 $\pm 5\%$ | 900-1200       | 45              | Avg          |

## Nd:YAG Laser Beamsplitter Plate

### Specifications

|                           |                                                   |
|---------------------------|---------------------------------------------------|
| Dimension Tolerance       | $\pm 0/-0.2\text{mm}$                             |
| Thickness Tolerance       | $\pm 0.2\text{mm}$                                |
| Surface Quality           | 60/40                                             |
| Clear Aperture            | $>90\%$                                           |
| Flatness                  | $<\lambda/4@633\text{nm}$ per 25mm                |
| Parallelism               | $<30$ arc seconds                                 |
| Chamfer                   | Protected $<0.5\text{mm} \times 45^\circ$         |
| T/R                       | $\pm 5\%$ at specific polarization state          |
| Coating(AOI= $45^\circ$ ) | S1: Partial reflectance coating<br>S2: AR coating |
| Damage Threshold          | $>5\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm    |

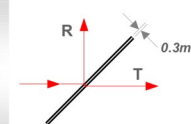
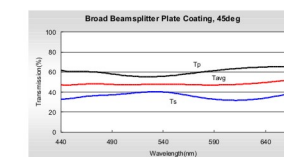


### Standard Product-Nd:YAG Laser Beamsplitter Plate

| Part No.                 |                          |                          | Material | T/R             | Wavelength(nm) | AOI( $^\circ$ ) | Polarization |
|--------------------------|--------------------------|--------------------------|----------|-----------------|----------------|-----------------|--------------|
| $\Phi 12.7*3.0\text{mm}$ | $\Phi 25.4*3.0\text{mm}$ | $\Phi 50.8*3.0\text{mm}$ |          |                 |                |                 |              |
| NLB0012-1064-P           | NLB0025-1064-P           | NLB0050-1064-P           | BK7      | 50:50 $\pm 5\%$ | 1028-1080      | 45              | P            |
| NLB0012-1064-S           | NLB0025-1064-S           | NLB0050-1064-S           | BK7      | 50:50 $\pm 5\%$ | 1028-1080      | 45              | S            |
| NLB0012-1064-AVG         | NLB0025-1064-AVG         | NLB0050-1064-AVG         | BK7      | 50:50 $\pm 5\%$ | 1028-1080      | 45              | Avg          |
| NLB0012-532-P            | NLB0025-532-P            | NLB0050-532-P            | BK7      | 50:50 $\pm 5\%$ | 515-532        | 45              | P            |
| NLB0012-532-S            | NLB0025-532-S            | NLB0050-532-S            | BK7      | 50:50 $\pm 5\%$ | 515-532        | 45              | S            |
| NLB0012-532-AVG          | NLB0025-532-AVG          | NLB0050-532-AVG          | BK7      | 50:50 $\pm 5\%$ | 515-532        | 45              | Avg          |
| NLB1012-355-P            | NLB1025-355-P            | NLB1050-355-P            | UVFS     | 50:50 $\pm 5\%$ | 351-355        | 45              | P            |
| NLB1012-355-S            | NLB1025-355-S            | NLB1050-355-S            | UVFS     | 50:50 $\pm 5\%$ | 351-355        | 45              | S            |
| NLB1012-355-AVG          | NLB1025-355-AVG          | NLB1050-355-AVG          | UVFS     | 50:50 $\pm 5\%$ | 351-355        | 45              | Avg          |
| NLB1012-266-P            | NLB1025-266-P            | NLB1050-266-P            | UVFS     | 50:50 $\pm 5\%$ | 260-270        | 45              | P            |
| NLB1012-266-S            | NLB1025-266-S            | NLB1050-266-S            | UVFS     | 50:50 $\pm 5\%$ | 260-270        | 45              | S            |
| NLB1012-266-AVG          | NLB1025-266-AVG          | NLB1050-266-AVG          | UVFS     | 50:50 $\pm 5\%$ | 260-270        | 45              | Avg          |

## Ultra Thin Beamsplitter Plate

- Minimize Beam Displacement
- Eliminate Ghost Image
- Easy to Handle With Mount
- Custom Size Available



### Specifications

|                                  |                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------|
| Dimension                        | Mount Diameter 25.4 $\pm 0/-0.2\text{mm}$                                        |
| Thickness                        | 6.0 $\pm 0.2\text{mm}$ for Mount, 0.3 $\pm 0.05\text{mm}$ for Beamsplitter plate |
| Beam Displacement                | 0.1mm                                                                            |
| Surface Quality                  | 60/40                                                                            |
| Clear Aperture                   | 18mm                                                                             |
| Transmitted Wavefront Distortion | $<\lambda/10@632.8\text{nm}$                                                     |
| Parallelism                      | $<5$ arc minutes                                                                 |
| T/R                              | 50/50 $\pm 5\%$ , $T=(T_s+T_p)/2$ , $R=(R_s+R_p)/2$                              |
| Coating(AOI= $45^\circ$ )        | S1: Partial reflectance coating<br>S2: AR coating                                |
| Damage Threshold                 | $>1\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm                                   |

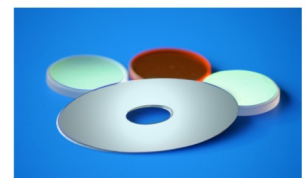
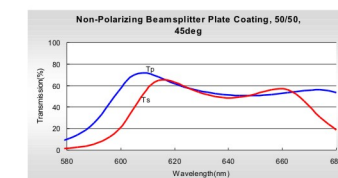
### Standard Product-Ultra Thin Beamsplitter Plate

| Part No.  | Material | Mount(mm)       | CA*T(mm) | T/R             | Wavelength(nm) | AOI( $^\circ$ ) | Polarization |
|-----------|----------|-----------------|----------|-----------------|----------------|-----------------|--------------|
| UTB0020-4 | BK7      | $\Phi 25.4*6.0$ | 18*0.3   | 50:50 $\pm 5\%$ | 400-700        | 45              | Avg          |
| UTB0020-6 | BK7      | $\Phi 25.4*6.0$ | 18*0.3   | 50:50 $\pm 5\%$ | 650-900        | 45              | Avg          |
| UTB0020-9 | BK7      | $\Phi 25.4*6.0$ | 18*0.3   | 50:50 $\pm 5\%$ | 900-1200       | 45              | Avg          |

Note: Other T/R and custom wavelength can be offered upon request.

## Non-Polarizing Beamsplitter Plate

- All Dielectric Coating
- High Damage Threshold
- T/R=50:50,  $|R_s-R_p|<5\%$
- Custom Design Available







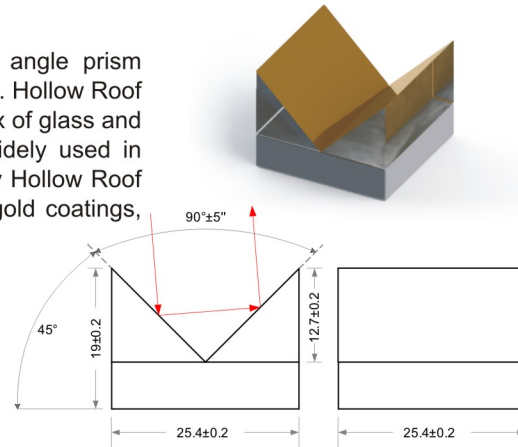
## Hollow Roof Prism Mirror

Hollow Roof Prism Mirror is constructed by two first surface right angle prism mirrors, the dihedral angle between two mirror surfaces is  $90^\circ \pm 5\text{arcsec}$ . Hollow Roof Prism Mirror is insensitive to chromatic dispersion of the refractive index of glass and the absorptive of glass, due to the optical path is in air, so it is widely used in interferometry and also building optical delay lines. Union Optic supply Hollow Roof Prism Mirror with different metal coatings, like aluminum, silver and gold coatings, dielectric coating is also available upon request.

- Hollow Design, No Chromatic Aberration & Material Absorption
- Dihedral Angle  $90^\circ \pm 5\text{arcsec}$
- $<\lambda/4@633\text{nm}$  Reflected Wavefront Distortion
- Aluminum, Silver, Gold & Dielectric Coating Available

### Specifications

|                     |                                                          |
|---------------------|----------------------------------------------------------|
| Dimension Tolerance | $\pm 0.2\text{mm}$                                       |
| Surface Quality     | 40/20 scratch and dig                                    |
| Clear Aperture      | $>90\%$                                                  |
| Flatness            | $<\lambda/4@632.8\text{nm}$                              |
| Dihedral Angle      | $90^\circ \pm 5\text{Arc Second}$                        |
| Coating             | Aluminum, Silver, Gold, Dielectric coatings upon request |
| Damage Threshold    | $>1\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm           |



Standard Product-Hollow Roof Prism Mirror

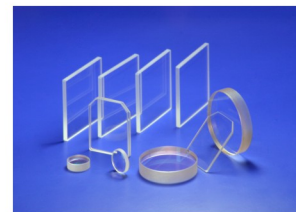
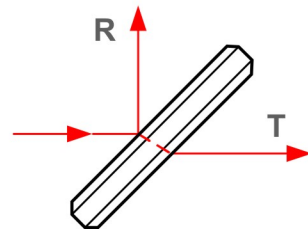
| Part No.    | Material | Dimension(mm) | Height(mm) | Angle Tolerance    | Coating           |
|-------------|----------|---------------|------------|--------------------|-------------------|
| HRM0025-MAL | Bk7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Aluminum          |
| HRM0025-EAL | BK7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Enhanced Aluminum |
| HRM0025-MAG | BK7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Silver            |
| HRM0025-MAU | BK7      | 25.4*25.4     | 19         | $90^\circ \pm 5''$ | Gold              |

## Beamsplitter

### Beamsplitter Plate

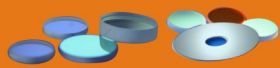
#### Specifications

|                     |                                                |
|---------------------|------------------------------------------------|
| Dimension Tolerance | $\pm 0/-0.2\text{mm}$                          |
| Thickness Tolerance | $\pm 0.2\text{mm}$                             |
| Surface Quality     | 60/40                                          |
| Clear Aperture      | $>90\%$                                        |
| Flatness            | $<\lambda/4@632.8\text{nm}$ per 25mm           |
| Parallelism         | $<1$ arc minute                                |
| Chamfer             | Protected $<0.5\text{mm} \times 45^\circ$      |
| T/R                 | $\pm 5\%$ , $T=(T_s+T_p)/2$ , $R=(R_s+R_p)/2$  |
| Coating(AOI=45deg)  | S1: Partial reflectance coating S2: AR coating |
| Damage Threshold    | $>1\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm |



### Standard Product-Round Beamsplitter Plate

| Part No.                        |                                 |                                 | Material | T/R             | Wavelength(nm) | AOI(°) | Polarization |
|---------------------------------|---------------------------------|---------------------------------|----------|-----------------|----------------|--------|--------------|
| $\Phi 12.7 \times 3.0\text{mm}$ | $\Phi 25.4 \times 3.0\text{mm}$ | $\Phi 50.8 \times 3.0\text{mm}$ |          |                 |                |        |              |
| BSP0112-4R2                     | BSP0125-4R2                     | BSP0150-4R2                     | BK7      | 20:80 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-4R3                     | BSP0125-4R3                     | BSP0150-4R3                     | BK7      | 30:70 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-4R4                     | BSP0125-4R4                     | BSP0150-4R4                     | BK7      | 40:60 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-4R                      | BSP0125-4R                      | BSP0150-4R                      | BK7      | 50:50 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-4R6                     | BSP0125-4R6                     | BSP0150-4R6                     | BK7      | 60:40 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-4R7                     | BSP0125-4R7                     | BSP0150-4R7                     | BK7      | 70:30 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-4R8                     | BSP0125-4R8                     | BSP0150-4R8                     | BK7      | 80:20 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-6R2                     | BSP0125-6R2                     | BSP0150-6R2                     | BK7      | 20:80 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-6R3                     | BSP0125-6R3                     | BSP0150-6R3                     | BK7      | 30:70 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-6R4                     | BSP0125-6R4                     | BSP0150-6R4                     | BK7      | 40:60 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-6R                      | BSP0125-6R                      | BSP0150-6R                      | BK7      | 50:50 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-6R6                     | BSP0125-6R6                     | BSP0150-6R6                     | BK7      | 60:40 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-6R7                     | BSP0125-6R7                     | BSP0150-6R7                     | BK7      | 70:30 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-6R8                     | BSP0125-6R8                     | BSP0150-6R8                     | BK7      | 80:20 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-9R2                     | BSP0125-9R2                     | BSP0150-9R2                     | BK7      | 20:80 $\pm 5\%$ | 900-1200       | 45     | Avg          |
| BSP0112-9R3                     | BSP0125-9R3                     | BSP0150-9R3                     | BK7      | 30:70 $\pm 5\%$ | 900-1200       | 45     | Avg          |
| BSP0112-9R4                     | BSP0125-9R4                     | BSP0150-9R4                     | BK7      | 40:60 $\pm 5\%$ | 900-1200       | 45     | Avg          |
| BSP0112-9R                      | BSP0125-9R                      | BSP0150-9R                      | BK7      | 50:50 $\pm 5\%$ | 900-1200       | 45     | Avg          |
| BSP0112-9R6                     | BSP0125-9R6                     | BSP0150-9R6                     | BK7      | 60:40 $\pm 5\%$ | 900-1200       | 45     | Avg          |
| BSP0112-9R7                     | BSP0125-9R7                     | BSP0150-9R7                     | BK7      | 70:30 $\pm 5\%$ | 900-1200       | 45     | Avg          |
| BSP0112-9R8                     | BSP0125-9R8                     | BSP0150-9R8                     | BK7      | 80:20 $\pm 5\%$ | 900-1200       | 45     | Avg          |



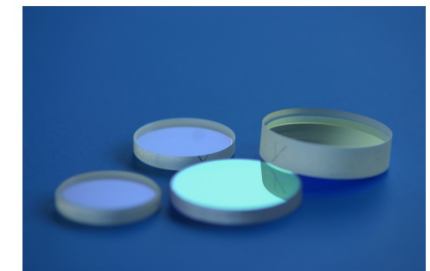
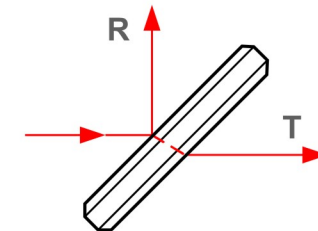
### Standard Product-Retangular Beamsplitter Plate

| Part No.                               |                                        |                                        | Material | T/R             | Wavelength(nm) | AOI(°) | Polarization |
|----------------------------------------|----------------------------------------|----------------------------------------|----------|-----------------|----------------|--------|--------------|
| $12.7 \times 12.7 \times 3.0\text{mm}$ | $25.4 \times 25.4 \times 3.0\text{mm}$ | $50.8 \times 50.8 \times 3.0\text{mm}$ |          |                 |                |        |              |
| BSP0112-4S                             | BSP0125-4S                             | BSP0150-4S                             | BK7      | 50:50 $\pm 5\%$ | 400-700        | 45     | Avg          |
| BSP0112-6S                             | BSP0125-6S                             | BSP0150-6S                             | BK7      | 50:50 $\pm 5\%$ | 650-900        | 45     | Avg          |
| BSP0112-9S                             | BSP0125-9S                             | BSP0150-9S                             | BK7      | 50:50 $\pm 5\%$ | 900-1200       | 45     | Avg          |

## Nd:YAG Laser Beamsplitter Plate

### Specifications

|                     |                                                   |
|---------------------|---------------------------------------------------|
| Dimension Tolerance | $\pm 0/-0.2\text{mm}$                             |
| Thickness Tolerance | $\pm 0.2\text{mm}$                                |
| Surface Quality     | 60/40                                             |
| Clear Aperture      | $>90\%$                                           |
| Flatness            | $<\lambda/4@633\text{nm}$ per 25mm                |
| Parallelism         | $<30$ arc seconds                                 |
| Chamfer             | Protected $<0.5\text{mm} \times 45^\circ$         |
| T/R                 | $\pm 5\%$ at specific polarization state          |
| Coating(AOI=45deg)  | S1: Partial reflectance coating<br>S2: AR coating |
| Damage Threshold    | $>5\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm    |

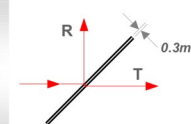
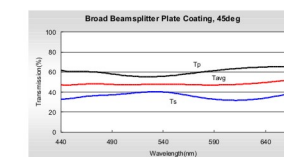


### Standard Product-Nd:YAG Laser Beamsplitter Plate

| Part No.                        |                                 |                                 | Material | T/R             | Wavelength(nm) | AOI(°) | Polarization |
|---------------------------------|---------------------------------|---------------------------------|----------|-----------------|----------------|--------|--------------|
| $\Phi 12.7 \times 3.0\text{mm}$ | $\Phi 25.4 \times 3.0\text{mm}$ | $\Phi 50.8 \times 3.0\text{mm}$ |          |                 |                |        |              |
| NLB0012-1064-P                  | NLB0025-1064-P                  | NLB0050-1064-P                  | BK7      | 50:50 $\pm 5\%$ | 1028-1080      | 45     | P            |
| NLB0012-1064-S                  | NLB0025-1064-S                  | NLB0050-1064-S                  | BK7      | 50:50 $\pm 5\%$ | 1028-1080      | 45     | S            |
| NLB0012-1064-AVG                | NLB0025-1064-AVG                | NLB0050-1064-AVG                | BK7      | 50:50 $\pm 5\%$ | 1028-1080      | 45     | Avg          |
| NLB0012-532-P                   | NLB0025-532-P                   | NLB0050-532-P                   | BK7      | 50:50 $\pm 5\%$ | 515-532        | 45     | P            |
| NLB0012-532-S                   | NLB0025-532-S                   | NLB0050-532-S                   | BK7      | 50:50 $\pm 5\%$ | 515-532        | 45     | S            |
| NLB0012-532-AVG                 | NLB0025-532-AVG                 | NLB0050-532-AVG                 | BK7      | 50:50 $\pm 5\%$ | 515-532        | 45     | Avg          |
| NLB1012-355-P                   | NLB1025-355-P                   | NLB1050-355-P                   | UVFS     | 50:50 $\pm 5\%$ | 351-355        | 45     | P            |
| NLB1012-355-S                   | NLB1025-355-S                   | NLB1050-355-S                   | UVFS     | 50:50 $\pm 5\%$ | 351-355        | 45     | S            |
| NLB1012-355-AVG                 | NLB1025-355-AVG                 | NLB1050-355-AVG                 | UVFS     | 50:50 $\pm 5\%$ | 351-355        | 45     | Avg          |
| NLB1012-266-P                   | NLB1025-266-P                   | NLB1050-266-P                   | UVFS     | 50:50 $\pm 5\%$ | 260-270        | 45     | P            |
| NLB1012-266-S                   | NLB1025-266-S                   | NLB1050-266-S                   | UVFS     | 50:50 $\pm 5\%$ | 260-270        | 45     | S            |
| NLB1012-266-AVG                 | NLB1025-266-AVG                 | NLB1050-266-AVG                 | UVFS     | 50:50 $\pm 5\%$ | 260-270        | 45     | Avg          |

## Ultra Thin Beamsplitter Plate

- Minimize Beam Displacement
- Eliminate Ghost Image
- Easy to Handle With Mount
- Custom Size Available



### Specifications

|                                  |                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------|
| Dimension                        | Mount Diameter $25.4 \pm 0/-0.2\text{mm}$                                        |
| Thickness                        | $6.0 \pm 0.2\text{mm}$ for Mount, $0.3 \pm 0.05\text{mm}$ for Beamsplitter plate |
| Beam Displacement                | 0.1mm                                                                            |
| Surface Quality                  | 60/40                                                                            |
| Clear Aperture                   | 18mm                                                                             |
| Transmitted Wavefront Distortion | $<\lambda/10@632.8\text{nm}$                                                     |
| Parallelism                      | $<5$ arc minutes                                                                 |
| T/R                              | 50/50 $\pm 5\%$ , $T=(T_s+T_p)/2$ , $R=(R_s+R_p)/2$                              |
| Coating(AOI=45°)                 | S1: Partial reflectance coating<br>S2: AR coating                                |
| Damage Threshold                 | $>1\text{J}/\text{cm}^2$ , 20ns, 20Hz, @1064nm                                   |

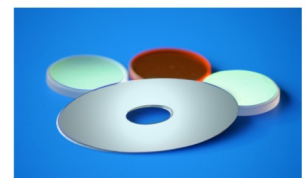
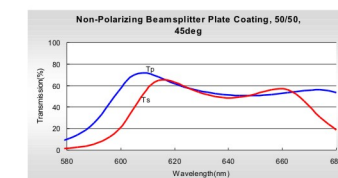
### Standard Product-Ultra Thin Beamsplitter Plate

| Part No.  | Material | Mount(mm)              | CA*T(mm) | T/R             | Wavelength(nm) | AOI(°) | Polarization |
|-----------|----------|------------------------|----------|-----------------|----------------|--------|--------------|
| UTB0020-4 | BK7      | $\Phi 25.4 \times 6.0$ | 18*0.3   | 50:50 $\pm 5\%$ | 400-700        | 45     | Avg          |
| UTB0020-6 | BK7      | $\Phi 25.4 \times 6.0$ | 18*0.3   | 50:50 $\pm 5\%$ | 650-900        | 45     | Avg          |
| UTB0020-9 | BK7      | $\Phi 25.4 \times 6.0$ | 18*0.3   | 50:50 $\pm 5\%$ | 900-1200       | 45     | Avg          |

Note: Other T/R and custom wavelength can be offered upon request.

## Non-Polarizing Beamsplitter Plate

- All Dielectric Coating
- High Damage Threshold
- T/R=50:50,  $|R_s-R_p|<5\%$
- Custom Design Available







Optical Element

Non-Polarizing Beamsplitter Plate/Beamsplitter Cube/Non-Polarizing Beamsplitter Cube



Optical Element

Non-Polarizing Beamsplitter Cube/Lateral Displacement Beamsplitter/Lateral Displacement Polarization Beamsplitter



## Specifications

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                    |
| Surface Quality     | 60/40 scratch and dig                                     |
| Clear Aperture      | >90%                                                      |
| Flatness            | <λ/4@632.8nm                                              |
| Beam Deviation      | <3 arc minutes                                            |
| Chamfer             | Protected <0.5mmx45°                                      |
| T/R                 | 50:50±5%                                                  |
| Polarization        | Rs-Rp <5%                                                 |
| Coating(AOI=45°)    | S1: Non-polarizing beamsplitter coating<br>S2: AR coating |
| Damage Threshold    | >3J/cm², 20ns, 20Hz, @1064nm                              |

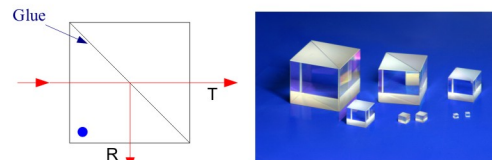
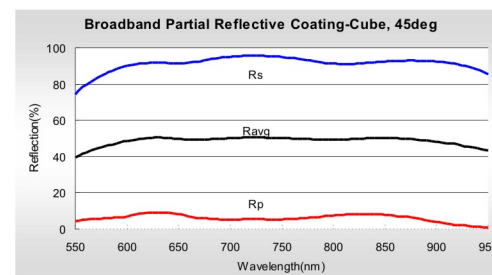
## Standard Product-Non-Polarizing Beamsplitter Plate

| Part No.     | Material | Dimension(mm) | T/R      | Wavelength(nm) | AOI(°) |
|--------------|----------|---------------|----------|----------------|--------|
| NBP1112-355  | UVFS     | Φ 12.7*3.0    | 50:50±5% | 351-355        | 45     |
| NBP1125-355  | UVFS     | Φ 25.4*3.0    | 50:50±5% | 351-355        | 45     |
| NBP1150-355  | UVFS     | Φ 50.8*3.0    | 50:50±5% | 351-355        | 45     |
| NBP0112-532  | BK7      | Φ 12.7*3.0    | 50:50±5% | 515-532        | 45     |
| NBP0125-532  | BK7      | Φ 25.4*3.0    | 50:50±5% | 515-532        | 45     |
| NBP0150-532  | BK7      | Φ 50.8*3.0    | 50:50±5% | 515-532        | 45     |
| NBP0112-633  | BK7      | Φ 12.7*3.0    | 50:50±5% | 633            | 45     |
| NBP0125-633  | BK7      | Φ 25.4*3.0    | 50:50±5% | 633            | 45     |
| NBP0150-633  | BK7      | Φ 50.8*3.0    | 50:50±5% | 633            | 45     |
| NBP0112-780  | BK7      | Φ 12.7*3.0    | 50:50±5% | 780-795        | 45     |
| NBP0125-780  | BK7      | Φ 25.4*3.0    | 50:50±5% | 780-795        | 45     |
| NBP0150-780  | BK7      | Φ 50.8*3.0    | 50:50±5% | 780-795        | 45     |
| NBP0112-1064 | BK7      | Φ 12.7*3.0    | 50:50±5% | 1053-1070      | 45     |
| NBP0125-1064 | BK7      | Φ 25.4*3.0    | 50:50±5% | 1053-1070      | 45     |
| NBP0150-1064 | BK7      | Φ 50.8*3.0    | 50:50±5% | 1053-1070      | 45     |

## Beamsplitter Cube

### Specifications

|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                                |
| Surface Quality     | 60/40                                                                 |
| Clear Aperture      | >90%                                                                  |
| Flatness            | <λ/4@632.8nm                                                          |
| Beam Deviation      | <3 arc minutes                                                        |
| Chamfer             | Protected <0.5mmx45°                                                  |
| Coating             | Partial reflectance on hypotenuse face<br>AR coating on all entrances |
| T/R                 | ±5%, T=(Ts+Tp)/2, R=(Rs+Rp)/2                                         |
| Damage Threshold    | >500mJ/cm², 20ns, 20Hz, @1064nm                                       |



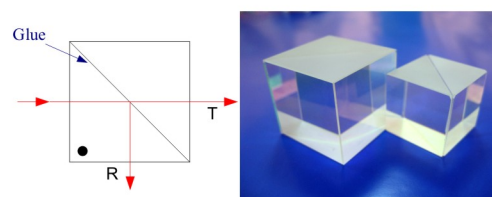
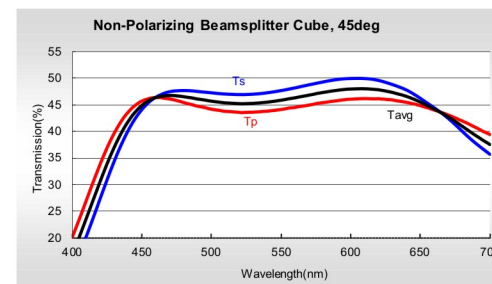
## Standard Product-Beamsplitter Cube

| Part No.  |           |            | Material | Dimension(mm)  | T/R      | Polarization |
|-----------|-----------|------------|----------|----------------|----------|--------------|
| 400-700nm | 650-900nm | 900-1200nm |          |                |          |              |
| BSC0105-4 | BSC0105-6 | BSC0105-9  | BK7      | 5.0*5.0*5.0    | 50:50±5% | Avg          |
| BSC0110-4 | BSC0110-6 | BSC0110-9  | BK7      | 10.0*10.0*10.0 | 50:50±5% | Avg          |
| BSC0112-4 | BSC0112-6 | BSC0112-9  | BK7      | 12.7*12.7*12.7 | 50:50±5% | Avg          |
| BSC0115-4 | BSC0115-6 | BSC0115-9  | BK7      | 15.0*15.0*15.0 | 50:50±5% | Avg          |
| BSC0120-4 | BSC0120-6 | BSC0120-9  | BK7      | 20.0*20.0*20.0 | 50:50±5% | Avg          |
| BSC0125-4 | BSC0125-6 | BSC0125-9  | BK7      | 25.4*25.4*25.4 | 50:50±5% | Avg          |

## Non-Polarizing Beamsplitter Cube

### Specifications

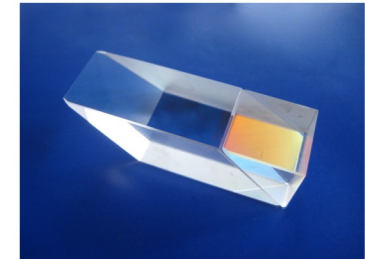
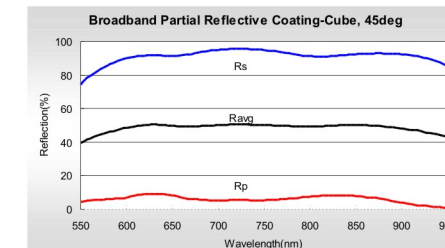
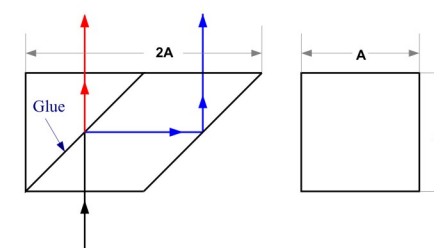
|                     |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                                                |
| Surface Quality     | 60/40                                                                                 |
| Clear Aperture      | >90%                                                                                  |
| Flatness            | <λ/4@632.8nm                                                                          |
| Beam Deviation      | <3 arc minutes                                                                        |
| Chamfer             | Protected <0.5mmx45°                                                                  |
| Absorption          | <10%                                                                                  |
| Transmission        | 45%±5%                                                                                |
| Polarization        | <6%                                                                                   |
| Coating             | Non-polarizing beamsplitter coating on hypotenuse face<br>AR coating on all entrances |
| Damage Threshold    | >100mJ/cm², 20ns, 20Hz, @1064nm                                                       |



## Standard Product-Non-Polarizing Beamsplitter Cube

| Part No.          |                   |                   |                   | Material | T/R      | Wavelength(nm) |
|-------------------|-------------------|-------------------|-------------------|----------|----------|----------------|
| 10*10*10mm        | 12.7*12.7*12.7mm  | 20*20*20mm        | 25.4*25.4*25.4mm  |          |          |                |
| NPB0110-532       | NPB0112-532       | NPB0120-532       | NPB0125-532       | BK7      | 45:45±5% | 532            |
| NPB0110-633       | NPB0112-633       | NPB0120-633       | NPB0125-633       | BK7      | 45:45±5% | 633            |
| NPB0110-780       | NPB0112-780       | NPB0120-780       | NPB0125-780       | BK7      | 45:45±5% | 780            |
| NPB0110-420-700   | NPB0112-420-700   | NPB0120-420-700   | NPB0125-420-700   | BK7      | 45:45±5% | 420-700        |
| NPB0110-700-1000  | NPB0112-700-1000  | NPB0120-700-1000  | NPB0125-700-1000  | BK7      | 45:45±5% | 700-1000       |
| NPB0110-900-1200  | NPB0112-900-1200  | NPB0120-900-1200  | NPB0125-900-1200  | BK7      | 45:45±5% | 900-1200       |
| NPB0110-1200-1600 | NPB0112-1200-1600 | NPB0120-1200-1600 | NPB0125-1200-1600 | BK7      | 45:45±5% | 1200-1600      |

## Lateral Displacement Beamsplitter



### Specifications

|                     |                                                                         |
|---------------------|-------------------------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                                  |
| Surface Quality     | 60/40 scratch and dig                                                   |
| Clear Aperture      | >90%                                                                    |
| Flatness            | <λ/4@632.8nm                                                            |
| Beam Deviation      | <3 arc minutes                                                          |
| Chamfer             | Protected <0.5mmx45°                                                    |
| Coating             | Partial reflectance on cemented surfaces<br>AR coating on all entrances |
| T/R                 | ±5%, T=(Ts+Tp)/2, R=(Rs+Rp)/2                                           |
| Damage Threshold    | >500mJ/cm², 20ns, 20Hz, @1064nm                                         |

## Standard Product-Lateral Displacement Beamsplitter

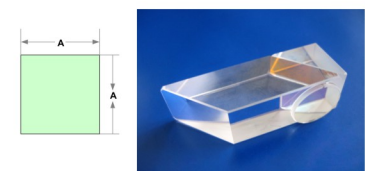
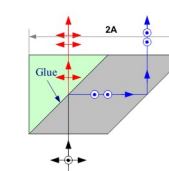
| Part No.  | Material | A(mm) | T/R      | Wavelength(nm) | Polarization |
|-----------|----------|-------|----------|----------------|--------------|
| LDB0112-4 | BK7      | 12.7  | 50:50±5% | 400-700        | Avg          |
| LDB0125-4 | BK7      | 25.4  | 50:50±5% | 400-700        | Avg          |
| LDB0112-6 | BK7      | 12.7  | 50:50±5% | 650-900        | Avg          |
| LDB0125-6 | BK7      | 25.4  | 50:50±5% | 650-900        | Avg          |
| LDB0112-9 | BK7      | 12.7  | 50:50±5% | 900-1200       | Avg          |
| LDB0125-9 | BK7      | 25.4  | 50:50±5% | 900-1200       | Avg          |

## Lateral Displacement Polarization Beamsplitter

Lateral displacement polarization Beamsplitter produces two parallel output beams which are separated by a lateral displacement. And the displacement is decided by the size of rhomboid prism. This Beamsplitter consists of one or two rhomboid prisms cemented to a right angle prism, and sometimes we can add a waveplate to manage the polarization state of the output beams. By using high precision prisms, we can ensure the parallelism between input and output beams within 30 arc seconds. And all entrances feature a multi layer anti-reflection coating.

### Specifications

|                                  |                                                                                                |
|----------------------------------|------------------------------------------------------------------------------------------------|
| Dimension Tolerance              | ±0.2mm                                                                                         |
| Surface Quality                  | 60/40 scratch and dig                                                                          |
| Clear Aperture                   | >90%                                                                                           |
| Transmitted Wavefront Distortion | <λ/4@632.8nm                                                                                   |
| Beam Deviation                   | <3 arc minute                                                                                  |
| Chamfer                          | Protected <0.5mmx45°                                                                           |
| Extinction Ratio                 | >100:1                                                                                         |
| Transmission                     | Tp>90%, Ts<1%                                                                                  |
| Coating                          | Rs>99%, Rp<5%                                                                                  |
| Reflection                       | Polarization beamsplitter coating on cemented surface AR coating on all input and output faces |
| Damage Threshold                 | >500mJ/cm², 20ns, 20Hz@1064nm                                                                  |



- Split incident beam into two displaced parallel beams
- Waveplate can be added to manage polarization state
- NOA61 cemented
- RoHS Compliant

## Standard Product-Lateral Displacement Polarization Beamsplitter

| Part No.  | Material | A(mm) | Tp/Ts  | Wavelength(nm) |
|-----------|----------|-------|--------|----------------|
| LDP0112-4 | K9       | 12.7  | >100:1 | 450-650        |
| LDP0125-4 | K9       | 25.4  | >100:1 | 450-650        |
| LDP0112-6 | K9       | 12.7  | >100:1 | 650-900        |
| LDP0125-6 | K9       | 25.4  | >100:1 | 650-900        |
| LDP0112-9 | K9       | 12.7  | >100:1 | 900-1200       |
| LDP0125-9 | K9       | 25.4  | >100:1 | 900-1200       |

Optical Material

Lens

Window

Mirror

Beamsplitter

Prism

Filter

Optical Material

Lens

Window

Mirror

Beamsplitter

Prism

Filter





Optical Element

Non-Polarizing Beamsplitter Plate/Beamsplitter Cube/Non-Polarizing Beamsplitter Cube



Optical Element

Non-Polarizing Beamsplitter Cube/Lateral Displacement Beamsplitter/Lateral Displacement Polarization Beamsplitter



## Specifications

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                    |
| Surface Quality     | 60/40 scratch and dig                                     |
| Clear Aperture      | >90%                                                      |
| Flatness            | <λ/4@632.8nm                                              |
| Beam Deviation      | <3 arc minutes                                            |
| Chamfer             | Protected <0.5mmx45°                                      |
| T/R                 | 50:50±5%                                                  |
| Polarization        | Rs-Rp <5%                                                 |
| Coating(AOI=45°)    | S1: Non-polarizing beamsplitter coating<br>S2: AR coating |
| Damage Threshold    | >3J/cm², 20ns, 20Hz, @1064nm                              |

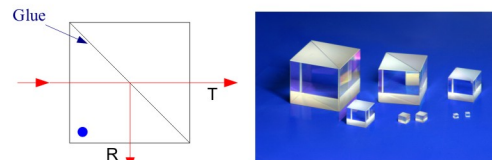
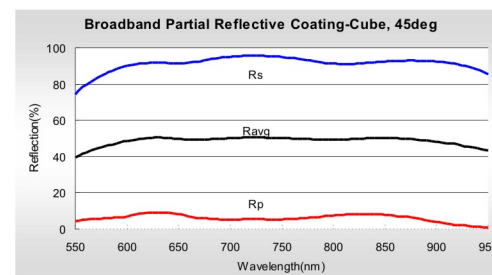
## Standard Product-Non-Polarizing Beamsplitter Plate

| Part No.     | Material | Dimension(mm) | T/R      | Wavelength(nm) | AOI(°) |
|--------------|----------|---------------|----------|----------------|--------|
| NBP1112-355  | UVFS     | Φ 12.7*3.0    | 50:50±5% | 351-355        | 45     |
| NBP1125-355  | UVFS     | Φ 25.4*3.0    | 50:50±5% | 351-355        | 45     |
| NBP1150-355  | UVFS     | Φ 50.8*3.0    | 50:50±5% | 351-355        | 45     |
| NBP0112-532  | BK7      | Φ 12.7*3.0    | 50:50±5% | 515-532        | 45     |
| NBP0125-532  | BK7      | Φ 25.4*3.0    | 50:50±5% | 515-532        | 45     |
| NBP0150-532  | BK7      | Φ 50.8*3.0    | 50:50±5% | 515-532        | 45     |
| NBP0112-633  | BK7      | Φ 12.7*3.0    | 50:50±5% | 633            | 45     |
| NBP0125-633  | BK7      | Φ 25.4*3.0    | 50:50±5% | 633            | 45     |
| NBP0150-633  | BK7      | Φ 50.8*3.0    | 50:50±5% | 633            | 45     |
| NBP0112-780  | BK7      | Φ 12.7*3.0    | 50:50±5% | 780-795        | 45     |
| NBP0125-780  | BK7      | Φ 25.4*3.0    | 50:50±5% | 780-795        | 45     |
| NBP0150-780  | BK7      | Φ 50.8*3.0    | 50:50±5% | 780-795        | 45     |
| NBP0112-1064 | BK7      | Φ 12.7*3.0    | 50:50±5% | 1053-1070      | 45     |
| NBP0125-1064 | BK7      | Φ 25.4*3.0    | 50:50±5% | 1053-1070      | 45     |
| NBP0150-1064 | BK7      | Φ 50.8*3.0    | 50:50±5% | 1053-1070      | 45     |

## Beamsplitter Cube

### Specifications

|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                                |
| Surface Quality     | 60/40                                                                 |
| Clear Aperture      | >90%                                                                  |
| Flatness            | <λ/4@632.8nm                                                          |
| Beam Deviation      | <3 arc minutes                                                        |
| Chamfer             | Protected <0.5mmx45°                                                  |
| Coating             | Partial reflectance on hypotenuse face<br>AR coating on all entrances |
| T/R                 | ±5%, T=(Ts+Tp)/2, R=(Rs+Rp)/2                                         |
| Damage Threshold    | >500mJ/cm², 20ns, 20Hz, @1064nm                                       |



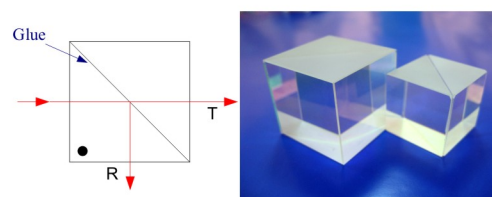
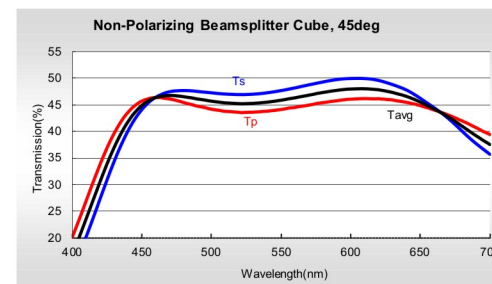
## Standard Product-Beamsplitter Cube

| Part No.  |           |            | Material | Dimension(mm)  | T/R      | Polarization |
|-----------|-----------|------------|----------|----------------|----------|--------------|
| 400-700nm | 650-900nm | 900-1200nm |          |                |          |              |
| BSC0105-4 | BSC0105-6 | BSC0105-9  | BK7      | 5.0*5.0*5.0    | 50:50±5% | Avg          |
| BSC0110-4 | BSC0110-6 | BSC0110-9  | BK7      | 10.0*10.0*10.0 | 50:50±5% | Avg          |
| BSC0112-4 | BSC0112-6 | BSC0112-9  | BK7      | 12.7*12.7*12.7 | 50:50±5% | Avg          |
| BSC0115-4 | BSC0115-6 | BSC0115-9  | BK7      | 15.0*15.0*15.0 | 50:50±5% | Avg          |
| BSC0120-4 | BSC0120-6 | BSC0120-9  | BK7      | 20.0*20.0*20.0 | 50:50±5% | Avg          |
| BSC0125-4 | BSC0125-6 | BSC0125-9  | BK7      | 25.4*25.4*25.4 | 50:50±5% | Avg          |

## Non-Polarizing Beamsplitter Cube

### Specifications

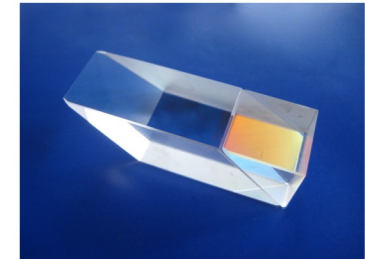
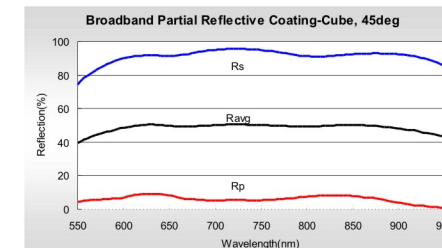
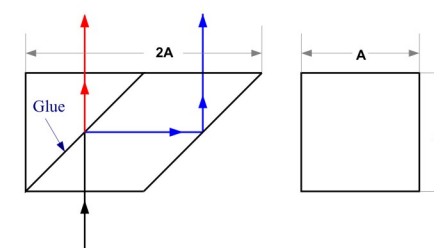
|                     |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                                                |
| Surface Quality     | 60/40                                                                                 |
| Clear Aperture      | >90%                                                                                  |
| Flatness            | <λ/4@632.8nm                                                                          |
| Beam Deviation      | <3 arc minutes                                                                        |
| Chamfer             | Protected <0.5mmx45°                                                                  |
| Absorption          | <10%                                                                                  |
| Transmission        | 45%±5%                                                                                |
| Polarization        | <6%                                                                                   |
| Coating             | Non-polarizing beamsplitter coating on hypotenuse face<br>AR coating on all entrances |
| Damage Threshold    | >100mJ/cm², 20ns, 20Hz, @1064nm                                                       |



## Standard Product-Non-Polarizing Beamsplitter Cube

| Part No.          |                   |                   |                   | Material | T/R      | Wavelength(nm) |
|-------------------|-------------------|-------------------|-------------------|----------|----------|----------------|
| 10*10*10mm        | 12.7*12.7*12.7mm  | 20*20*20mm        | 25.4*25.4*25.4mm  |          |          |                |
| NPB0110-532       | NPB0112-532       | NPB0120-532       | NPB0125-532       | BK7      | 45:45±5% | 532            |
| NPB0110-633       | NPB0112-633       | NPB0120-633       | NPB0125-633       | BK7      | 45:45±5% | 633            |
| NPB0110-780       | NPB0112-780       | NPB0120-780       | NPB0125-780       | BK7      | 45:45±5% | 780            |
| NPB0110-420-700   | NPB0112-420-700   | NPB0120-420-700   | NPB0125-420-700   | BK7      | 45:45±5% | 420-700        |
| NPB0110-700-1000  | NPB0112-700-1000  | NPB0120-700-1000  | NPB0125-700-1000  | BK7      | 45:45±5% | 700-1000       |
| NPB0110-900-1200  | NPB0112-900-1200  | NPB0120-900-1200  | NPB0125-900-1200  | BK7      | 45:45±5% | 900-1200       |
| NPB0110-1200-1600 | NPB0112-1200-1600 | NPB0120-1200-1600 | NPB0125-1200-1600 | BK7      | 45:45±5% | 1200-1600      |

## Lateral Displacement Beamsplitter



### Specifications

|                     |                                                                         |
|---------------------|-------------------------------------------------------------------------|
| Dimension Tolerance | ±0.2mm                                                                  |
| Surface Quality     | 60/40 scratch and dig                                                   |
| Clear Aperture      | >90%                                                                    |
| Flatness            | <λ/4@632.8nm                                                            |
| Beam Deviation      | <3 arc minutes                                                          |
| Chamfer             | Protected <0.5mmx45°                                                    |
| Coating             | Partial reflectance on cemented surfaces<br>AR coating on all entrances |
| T/R                 | ±5%, T=(Ts+Tp)/2, R=(Rs+Rp)/2                                           |
| Damage Threshold    | >500mJ/cm², 20ns, 20Hz, @1064nm                                         |

## Standard Product-Lateral Displacement Beamsplitter

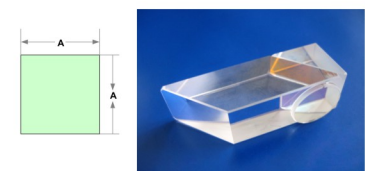
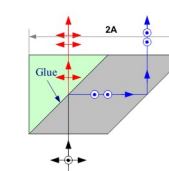
| Part No.  | Material | A(mm) | T/R      | Wavelength(nm) | Polarization |
|-----------|----------|-------|----------|----------------|--------------|
| LDB0112-4 | BK7      | 12.7  | 50:50±5% | 400-700        | Avg          |
| LDB0125-4 | BK7      | 25.4  | 50:50±5% | 400-700        | Avg          |
| LDB0112-6 | BK7      | 12.7  | 50:50±5% | 650-900        | Avg          |
| LDB0125-6 | BK7      | 25.4  | 50:50±5% | 650-900        | Avg          |
| LDB0112-9 | BK7      | 12.7  | 50:50±5% | 900-1200       | Avg          |
| LDB0125-9 | BK7      | 25.4  | 50:50±5% | 900-1200       | Avg          |

## Lateral Displacement Polarization Beamsplitter

Lateral displacement polarization Beamsplitter produces two parallel output beams which are separated by a lateral displacement. And the displacement is decided by the size of rhomboid prism. This Beamsplitter consists of one or two rhomboid prisms cemented to a right angle prism, and sometimes we can add a waveplate to manage the polarization state of the output beams. By using high precision prisms, we can ensure the parallelism between input and output beams within 30 arc seconds. And all entrances feature a multi layer anti-reflection coating.

### Specifications

|                                  |                                                                                                |
|----------------------------------|------------------------------------------------------------------------------------------------|
| Dimension Tolerance              | ±0.2mm                                                                                         |
| Surface Quality                  | 60/40 scratch and dig                                                                          |
| Clear Aperture                   | >90%                                                                                           |
| Transmitted Wavefront Distortion | <λ/4@632.8nm                                                                                   |
| Beam Deviation                   | <3 arc minute                                                                                  |
| Chamfer                          | Protected <0.5mmx45°                                                                           |
| Extinction Ratio                 | >100:1                                                                                         |
| Transmission                     | Tp>90%, Ts<1%                                                                                  |
| Coating                          | Rs>99%, Rp<5%                                                                                  |
| Reflection                       | Polarization beamsplitter coating on cemented surface AR coating on all input and output faces |
| Damage Threshold                 | >500mJ/cm², 20ns, 20Hz@1064nm                                                                  |



- Split incident beam into two displaced parallel beams
- Waveplate can be added to manage polarization state
- NOA61 cemented
- RoHS Compliant

## Standard Product-Lateral Displacement Polarization Beamsplitter

| Part No.  | Material | A(mm) | Tp/Ts  | Wavelength(nm) |
|-----------|----------|-------|--------|----------------|
| LDP0112-4 | K9       | 12.7  | >100:1 | 450-650        |
| LDP0125-4 | K9       | 25.4  | >100:1 | 450-650        |
| LDP0112-6 | K9       | 12.7  | >100:1 | 650-900        |
| LDP0125-6 | K9       | 25.4  | >100:1 | 650-900        |
| LDP0112-9 | K9       | 12.7  | >100:1 | 900-1200       |
| LDP0125-9 | K9       | 25.4  | >100:1 | 900-1200       |

Optical Material

Lens

Window

Mirror

Beamsplitter

Prism

Filter

Optical Material

Lens

Window

Mirror

Beamsplitter

Prism

Filter

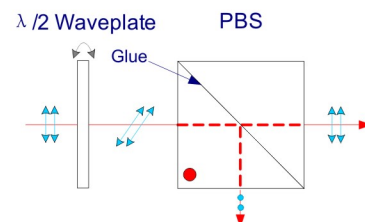




## Variable Beamsplitter/Attenuator

Variable Beamsplitter/Attenuator is a combination of a polarization Beamsplitter cube (PBS) and a zero order half waveplate made of crystal quartz. Variable Beamsplitter/Attenuator is used to continuously vary the transmitted intensity of a linearly polarized beam by rotating the waveplate, which can achieve split ratios (T:R) of 1:99 to 95:1. It is widely used in holography, interferometry and other applications.

- Continuously Variable Split Ratios (T:R) from 1:99 to 95:1
- High Extinction Ratio  $T_p/T_s > 1000:1$
- Zero Order Half Waveplate
- Two M4 hole available for mounting
- RoHS Compliant



### Specifications

|                             |                                             |
|-----------------------------|---------------------------------------------|
| Diameter Tolerance          | +0/-0.2mm                                   |
| Surface Quality             | 60/40                                       |
| Wavefront Distortion        | $< \lambda/4 @ 632.8\text{nm}$              |
| Beam Deviation              | $< 10$ arc minutes                          |
| Variable Split Ratios (T:R) | 1:99-95:1                                   |
| Retardation Tolerance       | $\lambda/300$ (Typical)                     |
| Extinction Ratio            | $T_p/T_s > 1000:1$                          |
| AR Coating                  | $R < 0.25\%$ per surface                    |
| Damage Threshold            | $> 500\text{mJ/cm}^2$ , 20ns, 20Hz, @1064nm |

### Standard Product-Variable Beamsplitter/Attenuator

| Part No.     | Dimension(mm)            | CA(mm) | Wavelength(nm) |
|--------------|--------------------------|--------|----------------|
| VBA0010-532  | $\Phi 25.4 \times 31.75$ | 10     | 532            |
| VBA0010-633  | $\Phi 25.4 \times 31.75$ | 10     | 633            |
| VBA0010-780  | $\Phi 25.4 \times 31.75$ | 10     | 780            |
| VBA0010-1064 | $\Phi 25.4 \times 31.75$ | 10     | 1064           |
| VBA0010-1550 | $\Phi 25.4 \times 31.75$ | 10     | 1550           |

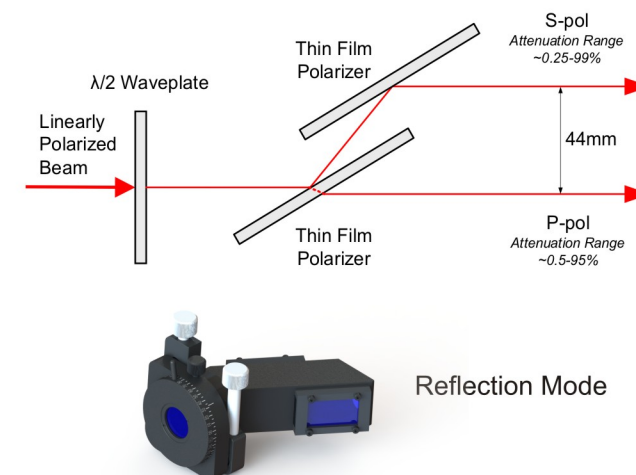
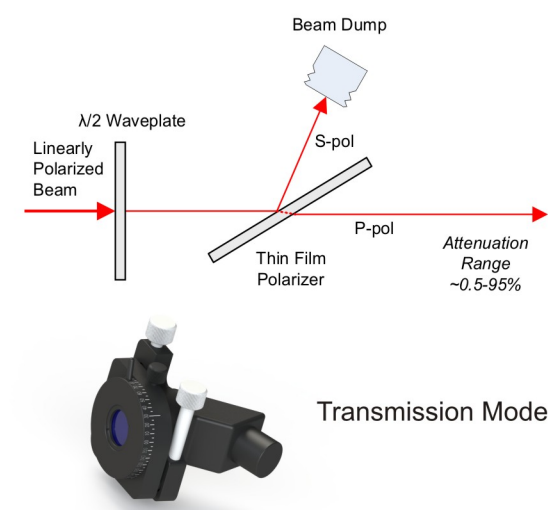
## High Power Variable Attenuator

High Power Variable Attenuator is a combination of one or two thin film polarization Beamsplitter plate and a zero order half waveplate made of crystal quartz. High Power Variable Attenuator is used to continuously vary the transmitted intensity of a linearly polarized beam by rotating the waveplate, which can achieve attenuation range from 0.25% to 99%. Two working mode is available, transmission mode and reflection mode. It is widely used to adjust power output in high power applications.

- Large Dynamic Range
- P-Pol Attenuation Range ~0.5%-95%
- S-Pol Attenuation Range ~0.25%-99%
- Zero Order Half Waveplate
- High Damage Threshold

### Specifications

|                                  |                                                           |
|----------------------------------|-----------------------------------------------------------|
| Clear Aperture                   | 14mm                                                      |
| Transmitted Wavefront Distortion | $< \lambda/10 @ 632.8\text{nm}$                           |
| Transmitted Beam Shift           | Transmission Mode: ~0.5mm<br>Reflection Mode: ~2.2mm      |
| Extinction Ratio                 | $> 200:1$                                                 |
| Attenuation Range                | Transmission Mode: 0.5%-95%<br>Reflection Mode: 0.25%-99% |
| Damage Threshold                 | $> 5\text{J/cm}^2$ , 20ns, 20Hz, @1064nm                  |



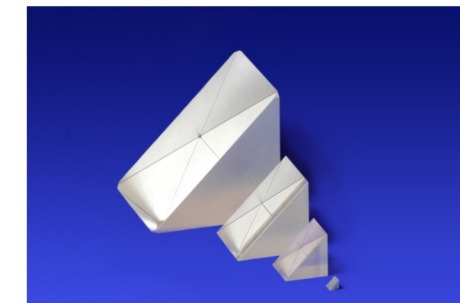
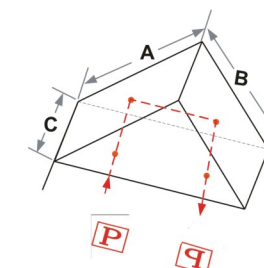
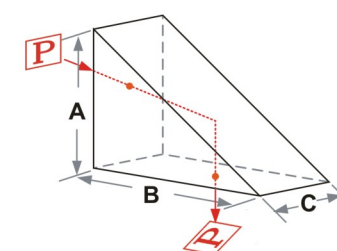
## Standard Product-High Power Variable Attenuator

| Part No.     | Type              | Wavelength(nm) | Clear Aperture(mm) | Attenuation Range |
|--------------|-------------------|----------------|--------------------|-------------------|
| VBA0120-266  | Transmission Mode | 266            | 14                 | 0.5%-95%          |
| VBA1120-266  | Reflection Mode   | 266            | 14                 | 0.25%-99%         |
| VBA0120-355  | Transmission Mode | 355            | 14                 | 0.5%-95%          |
| VBA1120-355  | Reflection Mode   | 355            | 14                 | 0.25%-99%         |
| VBA0120-532  | Transmission Mode | 532            | 14                 | 0.5%-95%          |
| VBA1120-532  | Reflection Mode   | 532            | 14                 | 0.25%-99%         |
| VBA0120-1064 | Transmission Mode | 1064           | 14                 | 0.5%-95%          |
| VBA1120-1064 | Reflection Mode   | 1064           | 14                 | 0.25%-99%         |

## Prism

### Right Angle Prism

Right Angle Prism can be used to bend a beam by 90deg or 180deg, depending on which face is entrance face. Please refer to following image to see how it works. Now Union Optic can provide right angle prisms from 0.5mm to 50.8mm size. Special size can also be offered upon request.



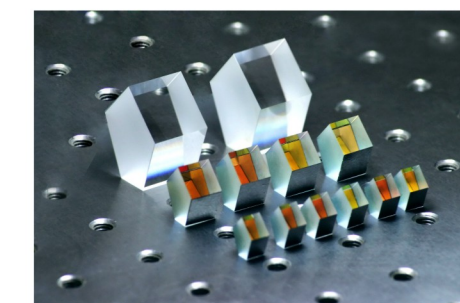
### Standard Product-Right Angle Prism

| Dimension(mm) | Part No.—BK7  | Part No.—Fused Silica |
|---------------|---------------|-----------------------|
| A=B=C         | $< 3$ arc min | $< 3$ arc min         |
| 2.0           | RAP0102       | RAP0002               |
| 3.2           | RAP0103       | RAP0003               |
| 5.0           | RAP0105       | RAP0005               |
| 10.0          | RAP0110       | RAP0010               |
| 12.7          | RAP0112       | RAP0012               |
| 15.0          | RAP0115       | RAP0015               |
| 20.0          | RAP0120       | RAP0020               |
| 25.4          | RAP0125       | RAP0025               |
| 30.0          | RAP0130       | RAP0030               |
| 38.1          | RAP0138       | RAP0038               |
| 50.8          | RAP0150       | RAP0050               |

Note: If you want to put mirror coatings on right angle prism, please refer to right angle prism mirror.

## Penta Prism

An incident beam can be deviated by 90 degree without inverting or reversing through a Penta prism. Penta prism has five sides, four of them polished. Two reflective sides are coated with metal or dielectric HR coating and these two sides can be blackened. The deviation angle of 90deg will not be changed if the penta prism is slightly adjusted, this will be convenient to install it. It is widely used in laser level, alignment and optical tooling. The reflecting surfaces of this prism must be coated with a metallic or dielectric reflective coating.



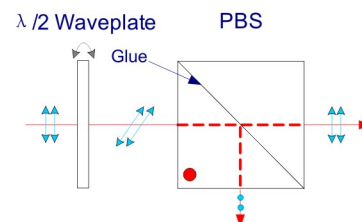




## Variable Beamsplitter/Attenuator

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- Continuously Variable Split Ratios (T:R) from 1:99 to 95:1
- High Extinction Ratio  $T_p/T_s > 1000:1$
- Zero Order Half Waveplate
- Two M4 hole available for mounting
- RoHS Compliant



### Specifications

|                             |                                             |
|-----------------------------|---------------------------------------------|
| Diameter Tolerance          | +0/-0.2mm                                   |
| Surface Quality             | 60/40                                       |
| Wavefront Distortion        | $< \lambda/4 @ 632.8\text{nm}$              |
| Beam Deviation              | $< 10$ arc minutes                          |
| Variable Split Ratios (T:R) | 1:99-95:1                                   |
| Retardation Tolerance       | $\lambda/300$ (Typical)                     |
| Extinction Ratio            | $T_p/T_s > 1000:1$                          |
| AR Coating                  | $R < 0.25\%$ per surface                    |
| Damage Threshold            | $> 500\text{mJ/cm}^2$ , 20ns, 20Hz, @1064nm |

### Standard Product-Variable Beamsplitter/Attenuator

| Part No.     | Dimension(mm)            | CA(mm) | Wavelength(nm) |
|--------------|--------------------------|--------|----------------|
| VBA0010-532  | $\Phi 25.4 \times 31.75$ | 10     | 532            |
| VBA0010-633  | $\Phi 25.4 \times 31.75$ | 10     | 633            |
| VBA0010-780  | $\Phi 25.4 \times 31.75$ | 10     | 780            |
| VBA0010-1064 | $\Phi 25.4 \times 31.75$ | 10     | 1064           |
| VBA0010-1550 | $\Phi 25.4 \times 31.75$ | 10     | 1550           |

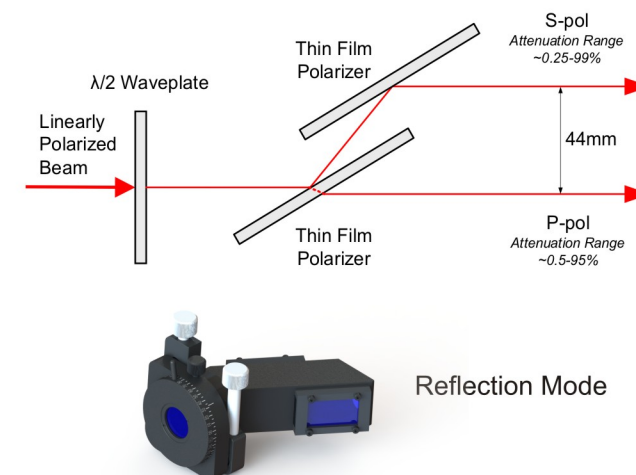
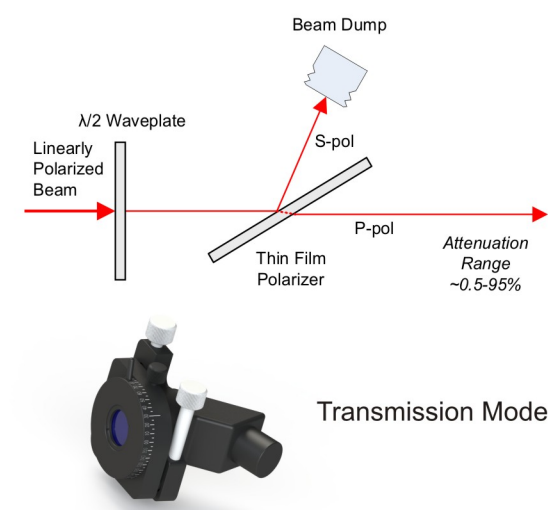
## High Power Variable Attenuator

High Power Variable Attenuator is a combination of one or two thin film polarization Beamsplitter plate and a zero order half waveplate made of crystal quartz. High Power Variable Attenuator is used to continuously vary the transmitted intensity of a linearly polarized beam by rotating the waveplate, which can achieve attenuation range from 0.25% to 99%. Two working mode is available, transmission mode and reflection mode. It is widely used to adjust power output in high power applications.

- Large Dynamic Range
- P-Pol Attenuation Range ~0.5%-95%
- S-Pol Attenuation Range ~0.25%-99%
- Zero Order Half Waveplate
- High Damage Threshold

### Specifications

|                                  |                                                           |
|----------------------------------|-----------------------------------------------------------|
| Clear Aperture                   | 14mm                                                      |
| Transmitted Wavefront Distortion | $< \lambda/10 @ 632.8\text{nm}$                           |
| Transmitted Beam Shift           | Transmission Mode: ~0.5mm<br>Reflection Mode: ~2.2mm      |
| Extinction Ratio                 | $> 200:1$                                                 |
| Attenuation Range                | Transmission Mode: 0.5%-95%<br>Reflection Mode: 0.25%-99% |
| Damage Threshold                 | $> 5\text{J/cm}^2$ , 20ns, 20Hz, @1064nm                  |



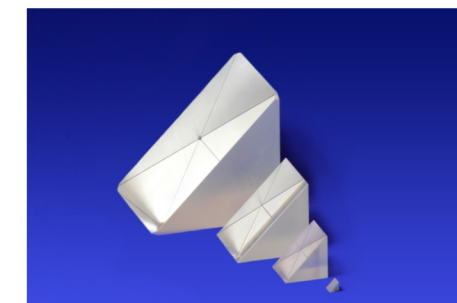
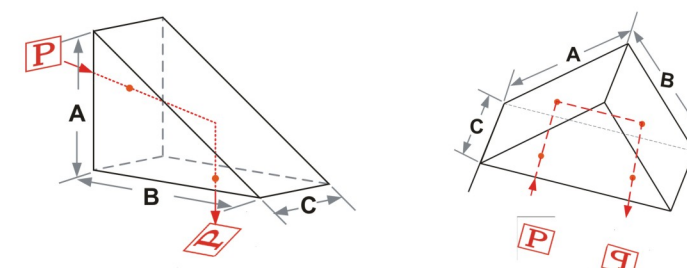
## Standard Product-High Power Variable Attenuator

| Part No.     | Type              | Wavelength(nm) | Clear Aperture(mm) | Attenuation Range |
|--------------|-------------------|----------------|--------------------|-------------------|
| VBA0120-266  | Transmission Mode | 266            | 14                 | 0.5%-95%          |
| VBA1120-266  | Reflection Mode   | 266            | 14                 | 0.25%-99%         |
| VBA0120-355  | Transmission Mode | 355            | 14                 | 0.5%-95%          |
| VBA1120-355  | Reflection Mode   | 355            | 14                 | 0.25%-99%         |
| VBA0120-532  | Transmission Mode | 532            | 14                 | 0.5%-95%          |
| VBA1120-532  | Reflection Mode   | 532            | 14                 | 0.25%-99%         |
| VBA0120-1064 | Transmission Mode | 1064           | 14                 | 0.5%-95%          |
| VBA1120-1064 | Reflection Mode   | 1064           | 14                 | 0.25%-99%         |

## Prism

### Right Angle Prism

Right Angle Prism can be used to bend a beam by 90deg or 180deg, depending on which face is entrance face. Please refer to following image to see how it works. Now Union Optic can provide right angle prisms from 0.5mm to 50.8mm size. Special size can also be offered upon request.



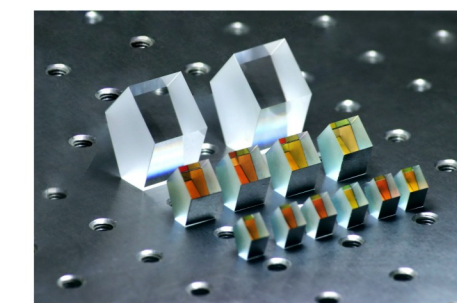
### Standard Product-Right Angle Prism

| Dimension(mm) | Part No.—BK7  |                | Part No.—Fused Silica |                |
|---------------|---------------|----------------|-----------------------|----------------|
| A=B=C         | $< 3$ arc min | $< 30$ arc sec | $< 3$ arc min         | $< 30$ arc sec |
| 2.0           | RAP0102       | RAP0002        | RAP1102               | RAP1002        |
| 3.2           | RAP0103       | RAP0003        | RAP1103               | RAP1003        |
| 5.0           | RAP0105       | RAP0005        | RAP1105               | RAP1005        |
| 10.0          | RAP0110       | RAP0010        | RAP1110               | RAP1010        |
| 12.7          | RAP0112       | RAP0012        | RAP1112               | RAP1012        |
| 15.0          | RAP0115       | RAP0015        | RAP1115               | RAP1015        |
| 20.0          | RAP0120       | RAP0020        | RAP1120               | RAP1020        |
| 25.4          | RAP0125       | RAP0025        | RAP1125               | RAP1025        |
| 30.0          | RAP0130       | RAP0030        | RAP1130               | RAP1030        |
| 38.1          | RAP0138       | RAP0038        | RAP1138               | RAP1038        |
| 50.8          | RAP0150       | RAP0050        | RAP1150               | RAP1050        |

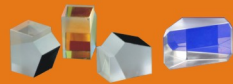
Note: If you want to put mirror coatings on right angle prism, please refer to right angle prism mirror.

## Penta Prism

An incident beam can be deviated by 90 degree without inverting or reversing through a Penta prism. Penta prism has five sides, four of them polished. Two reflective sides are coated with metal or dielectric HR coating and these two sides can be blackened. The deviation angle of 90deg will not be changed if the penta prism is slightly adjusted, this will be convenient to install it. It is widely used in laser level, alignment and optical tooling. The reflecting surfaces of this prism must be coated with a metallic or dielectric reflective coating.

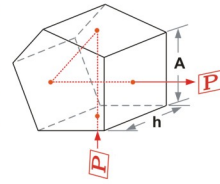






## Specifications

|                         |                                                                                  |
|-------------------------|----------------------------------------------------------------------------------|
| Dimension Tolerance     | ±0.2mm                                                                           |
| Surface Quality         | 60/40 scratch and dig                                                            |
| Clear Aperture          | >90%                                                                             |
| Flatness                | <λ/4@632.8nm                                                                     |
| 90° Deviation Tolerance | <30 arc seconds                                                                  |
| Coating                 | Protected Aluminum reflective coating<br>Single Layer MgF2 AR coating at visible |
| Chamfer                 | Protective<0.5mmx45°                                                             |



## Standard Product-Penta Prism

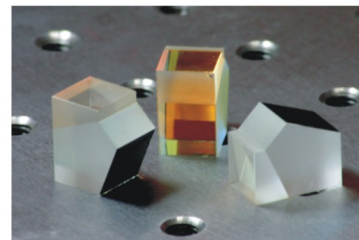
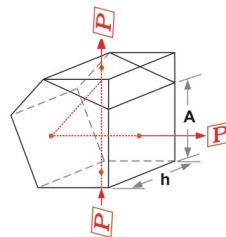
| Part No. | Material | A*h(mm)   | Deviation  |
|----------|----------|-----------|------------|
| PTP0007  | BK7      | 7.0*6.0   | <30Arc Sec |
| PTP0010  | BK7      | 10.0*10.0 | <30Arc Sec |
| PTP0020  | BK7      | 20.0*20.0 | <30Arc Sec |
| PTP0025  | BK7      | 25.4*25.4 | <30Arc Sec |

## Beamsplitter Penta Prism

Beamsplitter penta is combined with a penta prism and a wedge cemented on one reflective surface, a beamsplitter coating on the cemented interface to form a beamsplitter. Now the transmission/reflection (T/R) ratio of beamsplitter penta prism we provided include 20/80, 30/70, 40/60 and etc. Other T/R ratio is available upon request.

## Specifications

|                          |                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Dimension Tolerance      | ±0.2mm                                                                                                                             |
| Surface Quality          | 60/40 scratch and dig                                                                                                              |
| Clear Aperture           | >90%                                                                                                                               |
| Flatness                 | <λ/4@632.8nm                                                                                                                       |
| 90° Deviation Tolerance  | <30 arc seconds                                                                                                                    |
| 180° Deviation Tolerance | <30 arc seconds                                                                                                                    |
| Coating                  | Protected Aluminum reflective coating<br>Partial reflective coating on cemented surface<br>Single Layer MgF2 AR coating at visible |
| T/R Tolerance            | T/R: ±5%@400-700nm                                                                                                                 |
| Chamfer                  | Protective<0.5mmx45°                                                                                                               |



## Standard Product-Beamsplitter Penta Prism

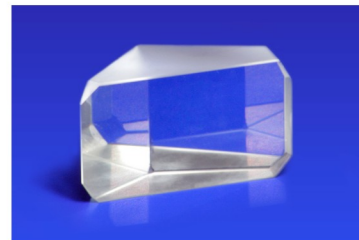
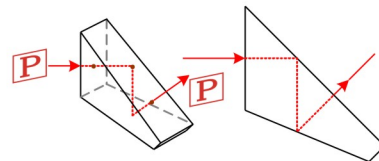
| Part No. | Material | A*h(mm)   | Deviation  | T/R      |
|----------|----------|-----------|------------|----------|
| SPP0007  | BK7      | 7.0*6.0   | <30arc sec | 20:80±5% |
| SPP0010  | BK7      | 10.0*10.0 | <30arc sec | 20:80±5% |
| SPP0020  | BK7      | 20.0*20.0 | <30arc sec | 20:80±5% |
| SPP0025  | BK7      | 25.4*25.4 | <30arc sec | 20:80±5% |

## Half Penta Prism

Half Penta prism is exactly an half cut from penta prism, it is widely used in telescope.

## Specifications

|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | ±0.2mm                |
| Surface Quality     | 60/40 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <λ/4@632.8nm          |
| Angle Tolerance     | <3 arc minutes        |

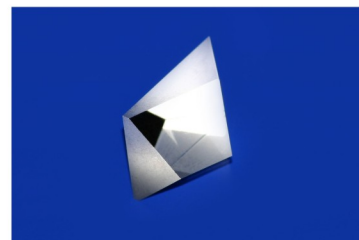


## Roof Half Penta Prism

Roof Half Penta prism is combined by half a penta prism and a totally internally reflecting roof which is attached to one of reflective face of the penta.

## Specifications

|                       |                       |
|-----------------------|-----------------------|
| Dimension Tolerance   | ±0.2mm                |
| Surface Quality       | 60/40 scratch and dig |
| Clear Aperture        | >90%                  |
| Flatness              | <λ/4@632.8nm          |
| Roof Angle Tolerance  | <3 arc seconds        |
| Other Angle Tolerance | <3 arc minutes        |



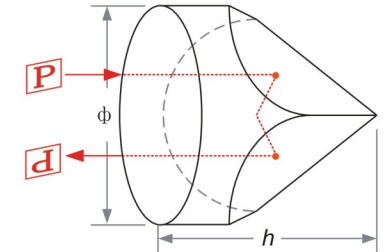
## Corner Cube Reflector

Corner Cube Retro Reflector operates on the principle of Total Internal Reflection (TIR). An incident beam will be reflected parallel to itself by the three roof surfaces. The reflection is insensitive to the incident angle, even when the incident beam enters the prism off normal axis, there will still be a strict 180deg reflection.



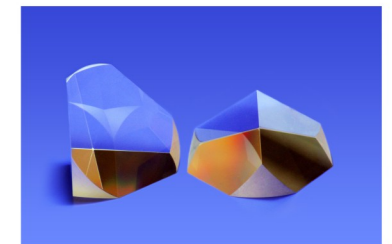
## Specifications

|                      |                                                                |
|----------------------|----------------------------------------------------------------|
| Dimension Tolerance  | +0/-0.2mm                                                      |
| Surface Quality      | 60/40 scratch and dig                                          |
| Clear Aperture       | >80%                                                           |
| Flatness             | <λ/4@632.8nm for big surface, <λ/10@632.8nm for small surfaces |
| Wavefront Distortion | <λ/2@632.8nm                                                   |
| Deviation            | Up to 180°±5 arc seconds                                       |
| Coating              | None, available                                                |



## Standard Product-Corner Cube Reflector

| Part No. | Material | Dia*h(mm) | Deviation  |
|----------|----------|-----------|------------|
| CNP0012  | BK7      | 12.7*10.0 | <30arc sec |
| CNP0015  | BK7      | 15.0*11.0 | <30arc sec |
| CNP0025  | BK7      | 25.4*19.0 | <10arc sec |
| CNP0050  | BK7      | 50.8*38.0 | <10arc sec |

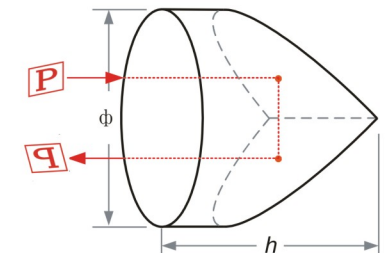


## Porro Prism

Porro prism is a type of reflection prism which can be used to alter the orientation of an image. Light enters the large face of the prism, then hits on the roof, by total internal reflection twice from the roof, the beam exits again through the large face. An image traveling through a Porro prism is rotated by 180deg but not inverted.

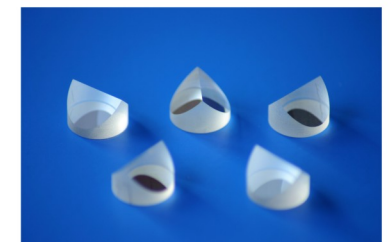
## Specifications

|                      |                                        |
|----------------------|----------------------------------------|
| Dimension Tolerance  | +0/-0.2mm                              |
| Surface Quality      | 60/40 scratch and dig                  |
| Clear Aperture       | >80%                                   |
| Flatness             | <λ/10@632.8nm                          |
| Wavefront Distortion | <λ/4@632.8nm                           |
| Deviation            | 180°±10 arc seconds                    |
| Roof Angle Tolerance | <5 arc seconds                         |
| Chamfer              | Sharp roof, other protective chamfered |
| AR Coating           | Available                              |



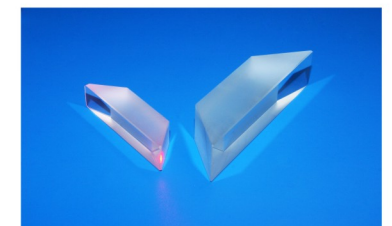
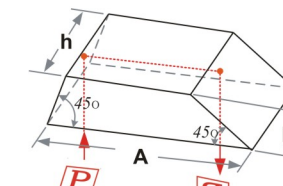
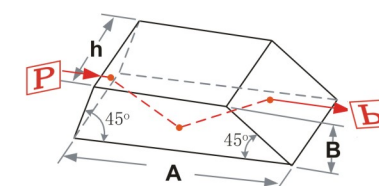
## Standard Product-Porro Prism

| Part No.  | Material | Dia*h(mm) | Deviation  | AR Coating(nm) |
|-----------|----------|-----------|------------|----------------|
| POP0012-0 | BK7      | 12.7*12.7 | <10arc sec | None           |
| POP0012-4 | BK7      | 12.7*12.7 | <10arc sec | 400-700        |
| POP0012-5 | BK7      | 12.7*12.7 | <10arc sec | 515-532        |
| POP0012-1 | BK7      | 12.7*12.7 | <10arc sec | 1028-1064      |
| POP1012-0 | UVFS     | 12.7*12.7 | <10arc sec | None           |
| POP1012-4 | UVFS     | 12.7*12.7 | <10arc sec | 400-700        |
| POP1012-5 | UVFS     | 12.7*12.7 | <10arc sec | 515-532        |
| POP1012-1 | UVFS     | 12.7*12.7 | <10arc sec | 1028-1064      |

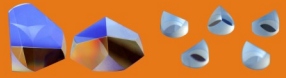
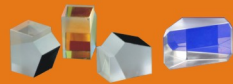


## Dove Prism

Dove prism is always used to rotate image. If you rotate the prism around a longitudinal axis, the image rotates through twice the angle the prism rotates through. Sometimes, dove prism is also used for 180deg reflection.

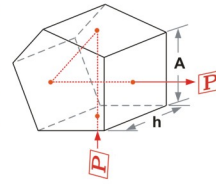






## Specifications

|                         |                                                                                  |
|-------------------------|----------------------------------------------------------------------------------|
| Dimension Tolerance     | ±0.2mm                                                                           |
| Surface Quality         | 60/40 scratch and dig                                                            |
| Clear Aperture          | >90%                                                                             |
| Flatness                | <λ/4@632.8nm                                                                     |
| 90° Deviation Tolerance | <30 arc seconds                                                                  |
| Coating                 | Protected Aluminum reflective coating<br>Single Layer MgF2 AR coating at visible |
| Chamfer                 | Protective<0.5mmx45°                                                             |



## Standard Product-Penta Prism

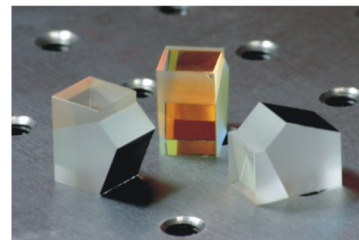
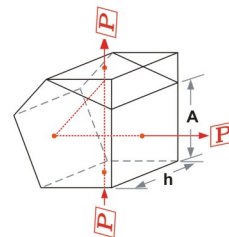
| Part No. | Material | A*h(mm)   | Deviation  |
|----------|----------|-----------|------------|
| PTP0007  | BK7      | 7.0*6.0   | <30Arc Sec |
| PTP0010  | BK7      | 10.0*10.0 | <30Arc Sec |
| PTP0020  | BK7      | 20.0*20.0 | <30Arc Sec |
| PTP0025  | BK7      | 25.4*25.4 | <30Arc Sec |

## Beamsplitter Penta Prism

Beamsplitter penta is combined with a penta prism and a wedge cemented on one reflective surface, a beamsplitter coating on the cemented interface to form a beamsplitter. Now the transmission/reflection (T/R) ratio of beamsplitter penta prism we provided include 20/80, 30/70, 40/60 and etc. Other T/R ratio is available upon request.

## Specifications

|                          |                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Dimension Tolerance      | ±0.2mm                                                                                                                             |
| Surface Quality          | 60/40 scratch and dig                                                                                                              |
| Clear Aperture           | >90%                                                                                                                               |
| Flatness                 | <λ/4@632.8nm                                                                                                                       |
| 90° Deviation Tolerance  | <30 arc seconds                                                                                                                    |
| 180° Deviation Tolerance | <30 arc seconds                                                                                                                    |
| Coating                  | Protected Aluminum reflective coating<br>Partial reflective coating on cemented surface<br>Single Layer MgF2 AR coating at visible |
| T/R Tolerance            | T/R: ±5%@400-700nm                                                                                                                 |
| Chamfer                  | Protective<0.5mmx45°                                                                                                               |



## Standard Product-Beamsplitter Penta Prism

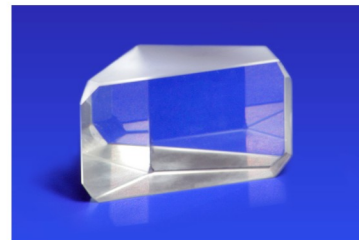
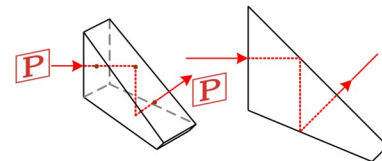
| Part No. | Material | A*h(mm)   | Deviation  | T/R      |
|----------|----------|-----------|------------|----------|
| SPP0007  | BK7      | 7.0*6.0   | <30arc sec | 20:80±5% |
| SPP0010  | BK7      | 10.0*10.0 | <30arc sec | 20:80±5% |
| SPP0020  | BK7      | 20.0*20.0 | <30arc sec | 20:80±5% |
| SPP0025  | BK7      | 25.4*25.4 | <30arc sec | 20:80±5% |

## Half Penta Prism

Half Penta prism is exactly an half cut from penta prism, it is widely used in telescope.

## Specifications

|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | ±0.2mm                |
| Surface Quality     | 60/40 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <λ/4@632.8nm          |
| Angle Tolerance     | <3 arc minutes        |

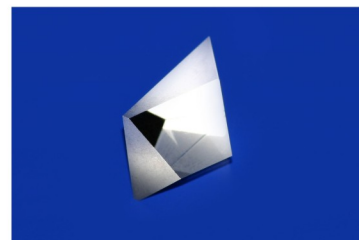


## Roof Half Penta Prism

Roof Half Penta prism is combined by half a penta prism and a totally internally reflecting roof which is attached to one of reflective face of the penta.

## Specifications

|                       |                       |
|-----------------------|-----------------------|
| Dimension Tolerance   | ±0.2mm                |
| Surface Quality       | 60/40 scratch and dig |
| Clear Aperture        | >90%                  |
| Flatness              | <λ/4@632.8nm          |
| Roof Angle Tolerance  | <3 arc seconds        |
| Other Angle Tolerance | <3 arc minutes        |

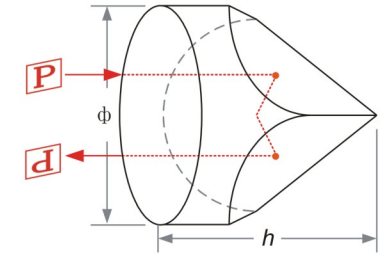


## Corner Cube Reflector

Corner Cube Retro Reflector operates on the principle of Total Internal Reflection (TIR). An incident beam will be reflected parallel to itself by the three roof surfaces. The reflection is insensitive to the incident angle, even when the incident beam enters the prism off normal axis, there will still be a strict 180deg reflection.

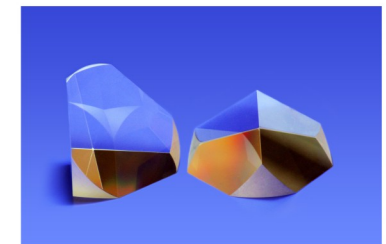
## Specifications

|                      |                                                                |
|----------------------|----------------------------------------------------------------|
| Dimension Tolerance  | +0/-0.2mm                                                      |
| Surface Quality      | 60/40 scratch and dig                                          |
| Clear Aperture       | >80%                                                           |
| Flatness             | <λ/4@632.8nm for big surface, <λ/10@632.8nm for small surfaces |
| Wavefront Distortion | <λ/2@632.8nm                                                   |
| Deviation            | Up to 180°±5 arc seconds                                       |
| Coating              | None, available                                                |



## Standard Product-Corner Cube Reflector

| Part No. | Material | Dia*h(mm) | Deviation  |
|----------|----------|-----------|------------|
| CNP0012  | BK7      | 12.7*10.0 | <30arc sec |
| CNP0015  | BK7      | 15.0*11.0 | <30arc sec |
| CNP0025  | BK7      | 25.4*19.0 | <10arc sec |
| CNP0050  | BK7      | 50.8*38.0 | <10arc sec |

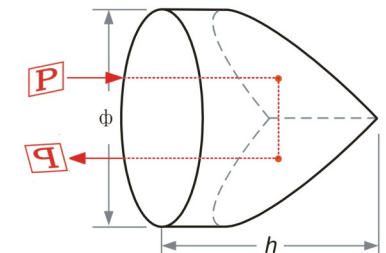


## Porro Prism

Porro prism is a type of reflection prism which can be used to alter the orientation of an image. Light enters the large face of the prism, then hits on the roof, by total internal reflection twice from the roof, the beam exits again through the large face. An image traveling through a Porro prism is rotated by 180deg but not inverted.

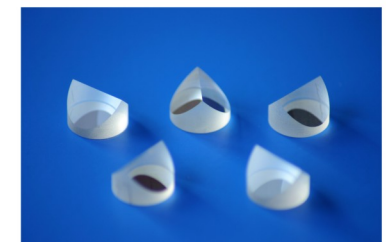
## Specifications

|                      |                                        |
|----------------------|----------------------------------------|
| Dimension Tolerance  | +0/-0.2mm                              |
| Surface Quality      | 60/40 scratch and dig                  |
| Clear Aperture       | >80%                                   |
| Flatness             | <λ/10@632.8nm                          |
| Wavefront Distortion | <λ/4@632.8nm                           |
| Deviation            | 180°±10 arc seconds                    |
| Roof Angle Tolerance | <5 arc seconds                         |
| Chamfer              | Sharp roof, other protective chamfered |
| AR Coating           | Available                              |



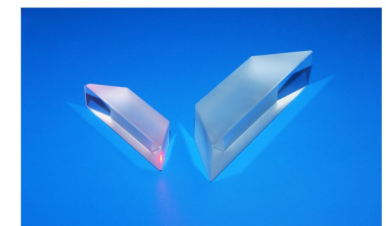
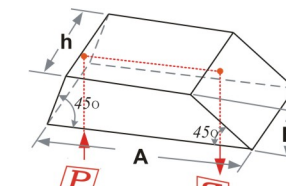
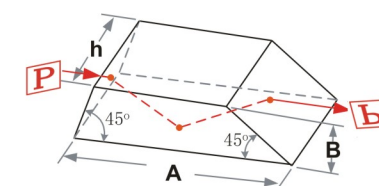
## Standard Product-Porro Prism

| Part No.  | Material | Dia*h(mm) | Deviation  | AR Coating(nm) |
|-----------|----------|-----------|------------|----------------|
| POP0012-0 | BK7      | 12.7*12.7 | <10arc sec | None           |
| POP0012-4 | BK7      | 12.7*12.7 | <10arc sec | 400-700        |
| POP0012-5 | BK7      | 12.7*12.7 | <10arc sec | 515-532        |
| POP0012-1 | BK7      | 12.7*12.7 | <10arc sec | 1028-1064      |
| POP1012-0 | UVFS     | 12.7*12.7 | <10arc sec | None           |
| POP1012-4 | UVFS     | 12.7*12.7 | <10arc sec | 400-700        |
| POP1012-5 | UVFS     | 12.7*12.7 | <10arc sec | 515-532        |
| POP1012-1 | UVFS     | 12.7*12.7 | <10arc sec | 1028-1064      |



## Dove Prism

Dove prism is always used to rotate image. If you rotate the prism around a longitudinal axis, the image rotates through twice the angle the prism rotates through. Sometimes, dove prism is also used for 180deg reflection.







## Specifications

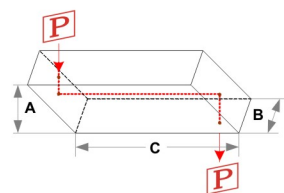
|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | ±0.2mm                |
| Surface Quality     | 60/40 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <λ/4@632.8nm          |
| Angle Tolerance     | <3 arc minutes        |
| Chamfer             | Protective<0.5mmx45°  |
| AR Coating          | None, available       |

## Standard Product-Dove Prism

| Part No. | Material | A(mm) | B(mm) | h(mm) |
|----------|----------|-------|-------|-------|
| DVP0105  | BK7      | 21.1  | 5.0   | 5.0   |
| DVP0110  | BK7      | 42.3  | 10.0  | 10.0  |
| DVP0115  | BK7      | 63.4  | 15.0  | 15.0  |
| DVP0120  | BK7      | 80.0  | 20.0  | 20.0  |

## Rhomboid Prism

Rhomboid prism can displace a laser beam without change the image orientation, the input beam is totally internal reflected by two 45degree faces and goes out from the output face. Then, a lateral displacement is produced. Higher transmission rate can be achieved by anti-reflective coating on the input and output faces. Rhomboid prism is always used in stereoscopic system and periscope system.



## Specifications

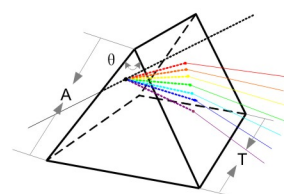
|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | ±0.2mm                |
| Surface Quality     | 60/40 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <λ/4@632.8nm          |
| Beam Deviation      | Up to 30 arc seconds  |
| Coating             | None, available       |

## Standard Product-Rhomboid Prism

| Part No. | Material | A(mm) | B(mm) | C(mm) | Deviation  |
|----------|----------|-------|-------|-------|------------|
| RBP0005  | BK7      | 5.0   | 5.0   | 7.1   | <30arc sec |
| RBP0105  | BK7      | 3.5   | 5.0   | 7.1   | <30arc sec |
| RBP0010  | BK7      | 10.0  | 10.0  | 14.1  | <30arc sec |
| RBP0110  | BK7      | 7.1   | 10.0  | 14.1  | <30arc sec |
| RBP0012  | BK7      | 12.7  | 12.7  | 18.0  | <30arc sec |
| RBP0112  | BK7      | 9.0   | 12.7  | 18.0  | <30arc sec |
| RBP0020  | BK7      | 20.0  | 20.0  | 28.3  | <30arc sec |
| RBP0120  | BK7      | 14.1  | 20.0  | 28.3  | <30arc sec |
| RBP0025  | BK7      | 25.4  | 25.4  | 35.9  | <30arc sec |
| RBP0125  | BK7      | 18.0  | 25.4  | 35.9  | <30arc sec |

## Brewster Prism

Brewster prism is one kind of dispersion prism, it is normally used to separate two wavelengths following the same beam path. Brewster prism is designed specifically for intra-cavity laser application, the beam enters and exits the prism at Brewster's angle, minimizing intra-cavity losses.



## Specifications

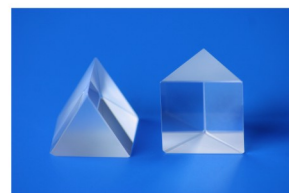
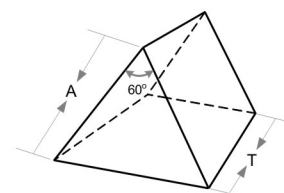
|                     |                                                 |
|---------------------|-------------------------------------------------|
| Dimension Tolerance | +0/-0.2mm                                       |
| Surface Quality     | 60/40 scratch and dig                           |
| Clear Aperture      | >90%                                            |
| Flatness            | <λ/4@632.8nm                                    |
| Angle Tolerance     | <5 arc minutes                                  |
| Polished Surface    | Two side surfaces polished, base is fine ground |
| Chamfer             | Protective<0.5mmx45°                            |
| Coating             | None, available                                 |

## Standard Product-Brewster Prism

| Part No. | Material | A(mm) | T(mm) | Apex Angle(°) | Wavelength(nm) |
|----------|----------|-------|-------|---------------|----------------|
| BRP0112  | BK7      | 12.7  | 12.7  | 67.0          | 800            |
| BRP0125  | BK7      | 25.4  | 25.4  | 67.0          | 800            |
| BRP1112  | UVFS     | 12.7  | 12.7  | 69.1          | 800            |
| BRP1125  | UVFS     | 25.4  | 25.4  | 69.1          | 800            |
| BRP9112  | SF11     | 12.7  | 12.7  | 59.0          | 800            |
| BRP9125  | SF11     | 25.4  | 25.4  | 59.0          | 800            |

## Equilateral Prism

Equilateral prism is one kind of dispersion prism. It has three equal 60deg angles and it can separate a beam of white light into its component colors. Equilateral prism is always used for wavelength separating applications and spectrum analysis.



## Specifications

|                     |                              |
|---------------------|------------------------------|
| Dimension Tolerance | +0/-0.2mm                    |
| Surface Quality     | 60/40 scratch and dig        |
| Clear Aperture      | >90%                         |
| Flatness            | <λ/4@632.8nm                 |
| Angle Tolerance     | 60°±3 arc minutes            |
| Polished Surface    | Three side surfaces polished |
| Chamfer             | Protective<0.5mmx45°         |
| Coating             | None, available              |

## Standard Product-Equilateral Prism

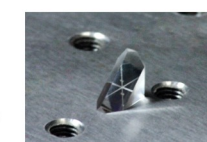
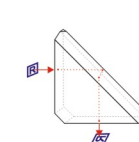
| Part No. | Material | Side Length A(mm) | Thickness T(mm) | Apex Angle(°) |
|----------|----------|-------------------|-----------------|---------------|
| ELP0112  | BK7      | 12.7              | 12.7            | 60            |
| ELP0125  | BK7      | 25.4              | 25.4            | 60            |
| ELP1112  | UVFS     | 12.7              | 12.7            | 60            |
| ELP1125  | UVFS     | 25.4              | 25.4            | 60            |
| ELP9112  | SF11     | 12.7              | 12.7            | 60            |
| ELP9125  | SF11     | 25.4              | 25.4            | 60            |

## Roof Prism

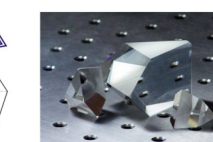
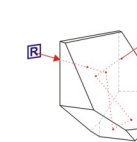
With the roof surface, these prisms are used to invert and reverse the image. Union Optic can provide roof right angle prisms, roof penta or half penta prisms, Schmidt prisms, or other roof prism specified by customers.

## Capabilities

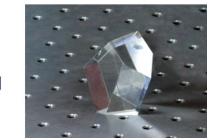
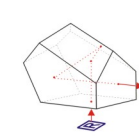
|                      |                                        |
|----------------------|----------------------------------------|
| Material             | BK7, Fused Silica, other optical glass |
| Dimension Tolerance  | +0/-0.2 mm                             |
| Surface Quality      | Up to 20/10 scratch and dig            |
| Clear Aperture       | >90%                                   |
| Flatness             | Up to λ/10@632.8nm                     |
| Angle Tolerance      | Up to 10 arc seconds                   |
| Roof Angle Tolerance | Up to 3 arc seconds                    |



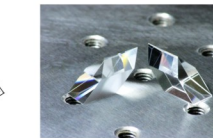
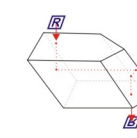
Roof Right Angle Prism



Schmidt Prism



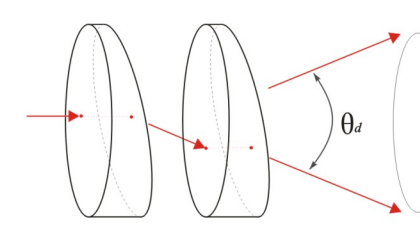
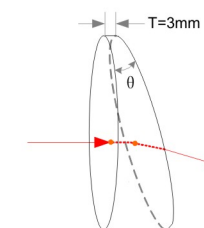
Roof Penta Prism



Roof Rhomboid Prism

## Wedge Prism

Wedge prism has plane inclined surfaces. It deflects light toward its thicker portion. It can be used individually to deflect a beam to a special angle. Two wedge prisms work together can assembly an anamorphic prism to correct the elliptical shape of laser beam. The wedge prism is ideal for laser beam steering applications. By combining two wedge prisms which can be rotate individually, we can direct the input beam to anywhere within the cone angle θd, where θd is 4x the specified angular deviation of one wedge. We can make deviation angle from 1deg to 10deg. Other angle can be realized upon request.



## Specifications

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| Material              | BK7 or UV Fused Silica                                      |
| Design Wavelength     | BK7: 632.8nm, n=1.515@632.8nm<br>UVFS: 355nm, n=1.476@355nm |
| Dimension Tolerance   | +0/-0.2mm                                                   |
| Thickness             | 3mm on the thinnest edge                                    |
| Surface Quality       | 60/40 scratch and dig                                       |
| Clear Aperture        | >90%                                                        |
| Flatness              | <λ/4@632.8nm                                                |
| Wedge Angle Tolerance | <3 arc minutes                                              |
| Deviation Angle       | From 1° to 10°                                              |
| Coating               | None, Available                                             |

## Standard Product-Wedge Prism

| Part No.  | Material | Diameter(mm) | Wedge Angle | Deviation Angle | Wavelength(nm) |
|-----------|----------|--------------|-------------|-----------------|----------------|
| WED0125-1 | BK7      | 25.4         | 1°57'       | 1°              | 632.8          |
| WED0125-2 | BK7      | 25.4         | 3°53'       | 2°              | 632.8          |
| WED0125-4 | BK7      | 25.4         | 7°41'       | 4°              | 632.8          |
| WED0125-6 | BK7      | 25.4         | 11°21'      | 6°              | 632.8          |
| WED1125-1 | UVFS     | 25.4         | 2°6'        | 1°              | 355            |
| WED1125-2 | UVFS     | 25.4         | 4°11'       | 2°              | 355            |
| WED1125-4 | UVFS     | 25.4         | 8°17'       | 4°              | 355            |
| WED1125-6 | UVFS     | 25.4         | 12°25'      | 6°              | 355            |





## Specifications

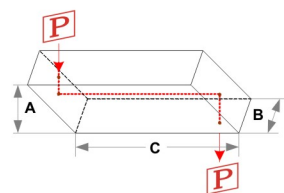
|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | ±0.2mm                |
| Surface Quality     | 60/40 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <λ/4@632.8nm          |
| Angle Tolerance     | <3 arc minutes        |
| Chamfer             | Protective<0.5mmx45°  |
| AR Coating          | None, available       |

## Standard Product-Dove Prism

| Part No. | Material | A(mm) | B(mm) | h(mm) |
|----------|----------|-------|-------|-------|
| DVP0105  | BK7      | 21.1  | 5.0   | 5.0   |
| DVP0110  | BK7      | 42.3  | 10.0  | 10.0  |
| DVP0115  | BK7      | 63.4  | 15.0  | 15.0  |
| DVP0120  | BK7      | 80.0  | 20.0  | 20.0  |

## Rhomboid Prism

Rhomboid prism can displace a laser beam without change the image orientation, the input beam is totally internal reflected by two 45degree faces and goes out from the output face. Then, a lateral displacement is produced. Higher transmission rate can be achieved by anti-reflective coating on the input and output faces. Rhomboid prism is always used in stereoscopic system and periscope system.



## Specifications

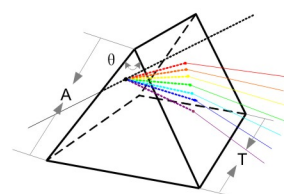
|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | ±0.2mm                |
| Surface Quality     | 60/40 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <λ/4@632.8nm          |
| Beam Deviation      | Up to 30 arc seconds  |
| Coating             | None, available       |

## Standard Product-Rhomboid Prism

| Part No. | Material | A(mm) | B(mm) | C(mm) | Deviation  |
|----------|----------|-------|-------|-------|------------|
| RBP0005  | BK7      | 5.0   | 5.0   | 7.1   | <30arc sec |
| RBP0105  | BK7      | 3.5   | 5.0   | 7.1   | <30arc sec |
| RBP0010  | BK7      | 10.0  | 10.0  | 14.1  | <30arc sec |
| RBP0110  | BK7      | 7.1   | 10.0  | 14.1  | <30arc sec |
| RBP0012  | BK7      | 12.7  | 12.7  | 18.0  | <30arc sec |
| RBP0112  | BK7      | 9.0   | 12.7  | 18.0  | <30arc sec |
| RBP0020  | BK7      | 20.0  | 20.0  | 28.3  | <30arc sec |
| RBP0120  | BK7      | 14.1  | 20.0  | 28.3  | <30arc sec |
| RBP0025  | BK7      | 25.4  | 25.4  | 35.9  | <30arc sec |
| RBP0125  | BK7      | 18.0  | 25.4  | 35.9  | <30arc sec |

## Brewster Prism

Brewster prism is one kind of dispersion prism, it is normally used to separate two wavelengths following the same beam path. Brewster prism is designed specifically for intra-cavity laser application, the beam enters and exits the prism at Brewster's angle, minimizing intra-cavity losses.



## Specifications

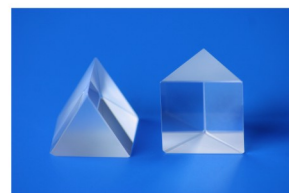
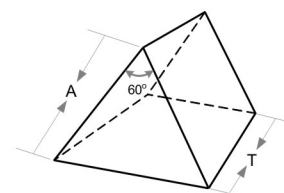
|                     |                                                 |
|---------------------|-------------------------------------------------|
| Dimension Tolerance | +0/-0.2mm                                       |
| Surface Quality     | 60/40 scratch and dig                           |
| Clear Aperture      | >90%                                            |
| Flatness            | <λ/4@632.8nm                                    |
| Angle Tolerance     | <5 arc minutes                                  |
| Polished Surface    | Two side surfaces polished, base is fine ground |
| Chamfer             | Protective<0.5mmx45°                            |
| Coating             | None, available                                 |

## Standard Product-Brewster Prism

| Part No. | Material | A(mm) | T(mm) | Apex Angle(°) | Wavelength(nm) |
|----------|----------|-------|-------|---------------|----------------|
| BRP0112  | BK7      | 12.7  | 12.7  | 67.0          | 800            |
| BRP0125  | BK7      | 25.4  | 25.4  | 67.0          | 800            |
| BRP1112  | UVFS     | 12.7  | 12.7  | 69.1          | 800            |
| BRP1125  | UVFS     | 25.4  | 25.4  | 69.1          | 800            |
| BRP9112  | SF11     | 12.7  | 12.7  | 59.0          | 800            |
| BRP9125  | SF11     | 25.4  | 25.4  | 59.0          | 800            |

## Equilateral Prism

Equilateral prism is one kind of dispersion prism. It has three equal 60deg angles and it can separate a beam of white light into its component colors. Equilateral prism is always used for wavelength separating applications and spectrum analysis.



## Specifications

|                     |                              |
|---------------------|------------------------------|
| Dimension Tolerance | +0/-0.2mm                    |
| Surface Quality     | 60/40 scratch and dig        |
| Clear Aperture      | >90%                         |
| Flatness            | <λ/4@632.8nm                 |
| Angle Tolerance     | 60°±3 arc minutes            |
| Polished Surface    | Three side surfaces polished |
| Chamfer             | Protective<0.5mmx45°         |
| Coating             | None, available              |

## Standard Product-Equilateral Prism

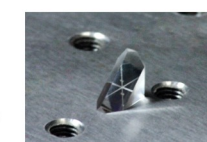
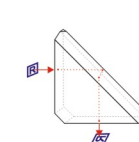
| Part No. | Material | Side Length A(mm) | Thickness T(mm) | Apex Angle(°) |
|----------|----------|-------------------|-----------------|---------------|
| ELP0112  | BK7      | 12.7              | 12.7            | 60            |
| ELP0125  | BK7      | 25.4              | 25.4            | 60            |
| ELP1112  | UVFS     | 12.7              | 12.7            | 60            |
| ELP1125  | UVFS     | 25.4              | 25.4            | 60            |
| ELP9112  | SF11     | 12.7              | 12.7            | 60            |
| ELP9125  | SF11     | 25.4              | 25.4            | 60            |

## Roof Prism

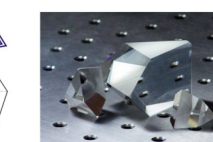
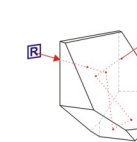
With the roof surface, these prisms are used to invert and reverse the image. Union Optic can provide roof right angle prisms, roof penta or half penta prisms, Schmidt prisms, or other roof prism specified by customers.

## Capabilities

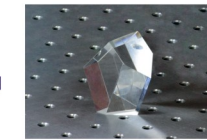
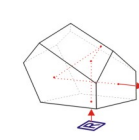
|                      |                                        |
|----------------------|----------------------------------------|
| Material             | BK7, Fused Silica, other optical glass |
| Dimension Tolerance  | +0/-0.2 mm                             |
| Surface Quality      | Up to 20/10 scratch and dig            |
| Clear Aperture       | >90%                                   |
| Flatness             | Up to λ/10@632.8nm                     |
| Angle Tolerance      | Up to 10 arc seconds                   |
| Roof Angle Tolerance | Up to 3 arc seconds                    |



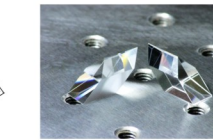
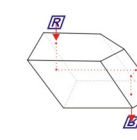
Roof Right Angle Prism



Schmidt Prism



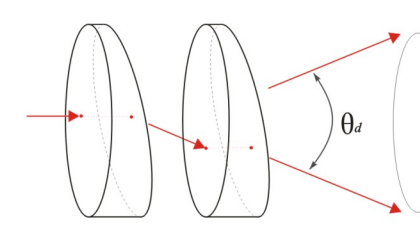
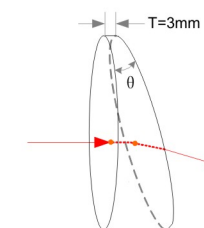
Roof Penta Prism



Roof Rhomboid Prism

## Wedge Prism

Wedge prism has plane inclined surfaces. It deflects light toward its thicker portion. It can be used individually to deflect a beam to a special angle. Two wedge prisms work together can assembly an anamorphic prism to correct the elliptical shape of laser beam. The wedge prism is ideal for laser beam steering applications. By combining two wedge prisms which can be rotate individually, we can direct the input beam to anywhere within the cone angle θd, where θd is 4x the specified angular deviation of one wedge. We can make deviation angle from 1deg to 10deg. Other angle can be realized upon request.



## Specifications

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| Material              | BK7 or UV Fused Silica                                      |
| Design Wavelength     | BK7: 632.8nm, n=1.515@632.8nm<br>UVFS: 355nm, n=1.476@355nm |
| Dimension Tolerance   | +0/-0.2mm                                                   |
| Thickness             | 3mm on the thinnest edge                                    |
| Surface Quality       | 60/40 scratch and dig                                       |
| Clear Aperture        | >90%                                                        |
| Flatness              | <λ/4@632.8nm                                                |
| Wedge Angle Tolerance | <3 arc minutes                                              |
| Deviation Angle       | From 1° to 10°                                              |
| Coating               | None, Available                                             |

## Standard Product-Wedge Prism

| Part No.  | Material | Diameter(mm) | Wedge Angle | Deviation Angle | Wavelength(nm) |
|-----------|----------|--------------|-------------|-----------------|----------------|
| WED0125-1 | BK7      | 25.4         | 1°57'       | 1°              | 632.8          |
| WED0125-2 | BK7      | 25.4         | 3°53'       | 2°              | 632.8          |
| WED0125-4 | BK7      | 25.4         | 7°41'       | 4°              | 632.8          |
| WED0125-6 | BK7      | 25.4         | 11°21'      | 6°              | 632.8          |
| WED1125-1 | UVFS     | 25.4         | 2°6'        | 1°              | 355            |
| WED1125-2 | UVFS     | 25.4         | 4°11'       | 2°              | 355            |
| WED1125-4 | UVFS     | 25.4         | 8°17'       | 4°              | 355            |
| WED1125-6 | UVFS     | 25.4         | 12°25'      | 6°              | 355            |



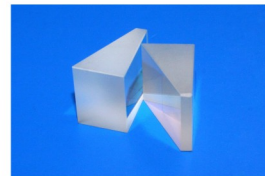
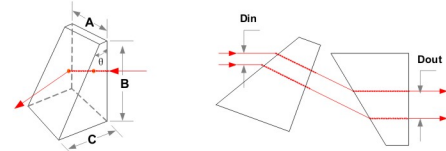


## Anamorphic Prism

Diode lasers usually feature an elliptical beam profile. While, mostly a circular beam shape is required, like mode-matching to an external resonator, adapting beam size to pass a small aperture of an isolator, and etc. Anamorphic Prism Pairs are used to transform elliptical laser diode beams into nearly circular beams by magnifying the elliptical beam in one dimension.

### Specifications

|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | ±0.2mm                |
| Surface Quality     | 60/40 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <λ/4@632.8nm          |
| Angle Tolerance     | <3 arc minutes        |
| Chamfer             | Protective<0.5mmx45°  |
| Coating             | None, available       |



Standard Product-Anamorphic Prism

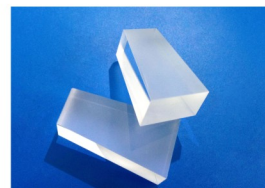
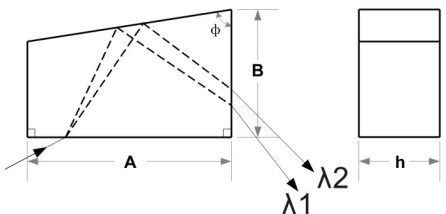
| Part No. | Material | A(mm) | B(mm) | C(mm) | Wedge Angle |
|----------|----------|-------|-------|-------|-------------|
| ANP9112  | N-SF11   | 12.0  | 12.0  | 8.5   | 29°26'      |

## Pellin Broca Prism

Pellin Broca Prism is always used to separate the harmonics of laser beam, it can be also used to compensate for group velocity dispersion. Due to the beam enters and exits the prism at Brewster's angle, the power loss is extremely low for P-polarized beam. The angle between input and output beam is close to 90deg.

### Specifications

|                     |                      |
|---------------------|----------------------|
| Dimension Tolerance | ±0.2mm               |
| Surface Quality     | 40/20                |
| Clear Aperture      | >90%                 |
| Flatness            | <λ/8@632.8nm         |
| Angle Tolerance     | <3 arc minutes       |
| Chamfer             | Protective<0.5mmx45° |
| Coating             | None, available      |

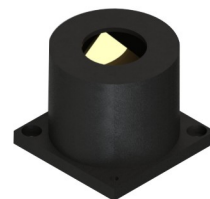


Standard Product-Pellin Broca Prism

| Part No. | Material | A(mm) | B (mm) | h(mm) | Φ(°)  | Design Wavelength(nm) |
|----------|----------|-------|--------|-------|-------|-----------------------|
| PPB0111  | BK7      | 33    | 19     | 11    | 78.43 | 380-2100              |
| PPB0122  | BK7      | 66    | 38     | 22    | 78.43 | 380-2100              |
| PPB1111  | UVFS     | 33    | 19     | 11    | 78.43 | 190-2200              |
| PPB1122  | UVFS     | 66    | 38     | 22    | 78.43 | 190-2200              |

## Hollow Retroreflector

Hollow Retroreflector is constructed by three first surface mirrors assembled into a corner cube prism. This produces a lightweight hollow corner cube which is totally insensitive to position and movement. It reflects the incident light back to its original source with good accuracy, regardless of the angle of incidence. Hollow Retroreflector is insensitive to chromatic dispersion of the refractive index of glass and the absorptive of glass, due to the optical path is in air. Hollow Retroreflector is installed in a mount features a variety of mounting holes.



- Hollow Lightweight Design
- No Chromatic Aberration & Material Absorption
- As Low As 1 Arc Second Deviation
- Low Reflected Wavefront Distortion
- Stress-Free Mounting, Good Thermal Stability
- Protected Aluminum and Protected Gold Coating Available

### Specifications

|                  |                                                        |
|------------------|--------------------------------------------------------|
| Mirror Material  | Fused Silica                                           |
| Mount Material   | Black Anodized Aluminum                                |
| Surface Quality  | 60/40 scratch and dig                                  |
| Beam Deviation   | 180°                                                   |
| Coating          | Protected Aluminum, Protected Gold, other upon request |
| Damage Threshold | >1J/cm², 20ns, 20Hz, @1064nm                           |

Standard Product-Hollow Retroreflector

| Part No.           |                | Dimension (mm) | CA (mm) | Wavefront @633nm(λ) | Deviation |
|--------------------|----------------|----------------|---------|---------------------|-----------|
| Protected Aluminum | Protected Gold |                |         |                     |           |
| HRR0512-MAL        | HRR0512-MAU    | 36*36-31       | 12.7    | 0.3                 | 5arc sec  |
| HRR0125-MAL        | HRR0125-MAU    | 55*55-46       | 25.4    | 0.1                 | 1arc sec  |
| HRR0525-MAL        | HRR0525-MAU    | 55*55-46       | 25.4    | 0.5                 | 5arc sec  |
| HRR1025-MAL        | HRR1025-MAU    | 55*55-46       | 25.4    | 1                   | 10arc sec |
| HRR0150-MAL        | HRR0150-MAU    | 85*85-83       | 50.8    | 0.25                | 1arc sec  |
| HRR0550-MAL        | HRR0550-MAU    | 85*85-83       | 50.8    | 1.25                | 5arc sec  |
| HRR1050-MAL        | HRR1050-MAU    | 85*85-83       | 50.8    | 2                   | 10arc sec |
| HRR0113-MAL        | HRR0113-MAU    | 360*360-310    | 127     | 0.65                | 1arc sec  |
| HRR0513-MAL        | HRR0513-MAU    | 360*360-310    | 127     | 3                   | 5arc sec  |

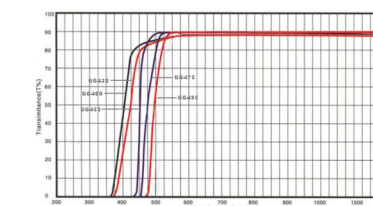
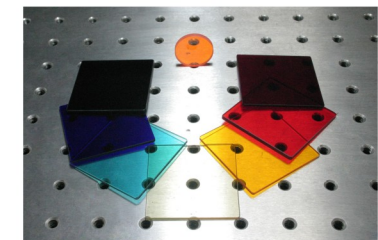


## Filter

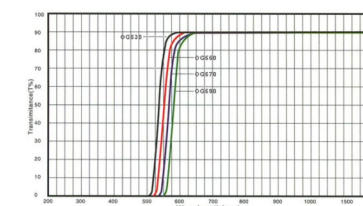
### Color Glass Filter

Due to its selective absorption in visible wavelength range, color glass filter will exhibit various color depending the glass type. Color glass filter provides an economical filter for various applications. Optical glass filters are widely used in safety glasses, industrial measurement, regulation technology and environment protection.

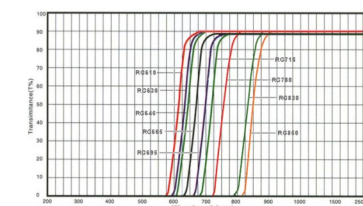
Union Optic can provide various color glass filters or its substitutes. Here is a list of frequently used filters.



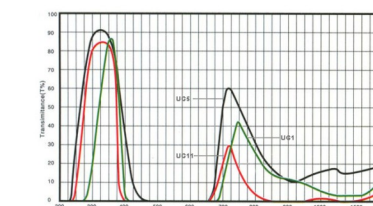
GG Series: Yellow glass GG400, GG420, GG455, GG475, GG495



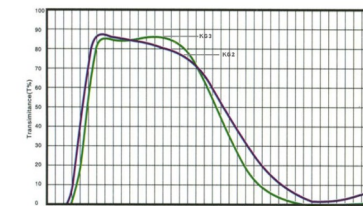
OG Series: Orange glass OG530, OG550, OG570, OG590



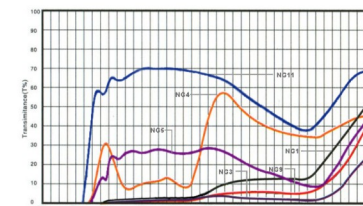
RG Series: Red and black glass, IR transmitting RG610, RG630, RG645, RG665, RG695, RG715, RG780, RG830, RG850



UG Series: Black blue glasses, ultraviolet transmitting UG1, UG5, UG11



KG Series: Colorless glass with high transmission in the visible and absorption in the IR range (heat protection filters) KG2, KG3



NG Series: Neutral glass with uniform attenuation in the visible range NG1, NG3, NG4, NG5, NG9, NG11

### Specifications

|                     |                       |
|---------------------|-----------------------|
| Dimension Tolerance | +0/-0.2mm             |
| Thickness Tolerance | ±0.2mm                |
| Surface Quality     | 80/50 scratch and dig |
| Clear Aperture      | >90%                  |
| Flatness            | <2λ@632.8nm           |
| Parallelism         | <5 arc minutes        |
| Chamfer             | Protective            |

### Order Information

|     |       |      |   |
|-----|-------|------|---|
| CFT | RG610 | 25.4 | 2 |
|-----|-------|------|---|

CFT-Glass Name-Dimension-Thickness

Other frequently used color filter:

WG: WG280, WG295, WG320, WG345, WG360

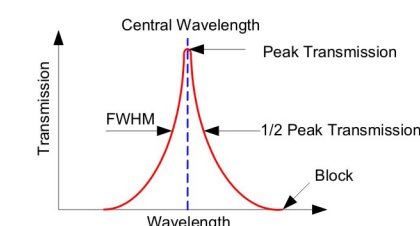
BG: BG3, BG4, BG7, BG12, BG14, BG18, BG20, BG25, BG38, BG39

VG: VG5, VG6, VG8, VG9, VG10, VG11

## Interference Bandpass Filter

### Specifications

|                          |                  |
|--------------------------|------------------|
| Mount Diameter Tolerance | +0/-0.2mm        |
| Clear Aperture           | >80%             |
| Thickness                | <10mm            |
| CWL Tolerance            | ±2nm             |
| FWHM                     | 10±2nm           |
| Peak Transmission        | >45%             |
| Block                    | <0.1%@200-1100nm |
| CWL Shift                | <0.02nm/°C       |



Standard Product-Interference Bandpass Filter

| Part No.     | Mount Diameter(mm) | Mount Thickness(mm) | Clear Aperture(mm) | Central Wavelength(nm) | FWHM(nm) |
|--------------|--------------------|---------------------|--------------------|------------------------|----------|
| ITF9125-532  | 25.4               | 6.0                 | 18.0               | 532                    | 10       |
| ITF9125-633  | 25.4               | 6.0                 | 18.0               | 633                    | 10       |
| ITF9125-1064 | 25.4               | 6.0                 | 18.0               | 1064                   | 10       |