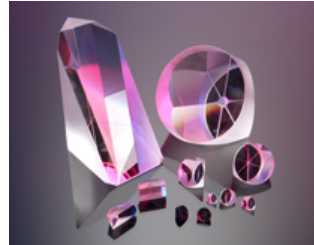


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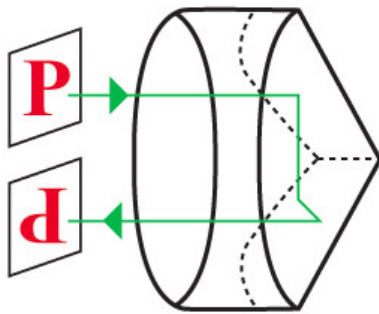
Precision Optics

PG&O's precision optical fabrication facility specializes in sophisticated optics and plano optical components. With our many years of combined experience and expertise, our in-house engineering team is committed to working closely with your engineers to deliver needed components in a timely manner. We offer a wide variety of high quality, cost-effective precision optical products, including:



Corner cube retro-reflectors **Penta prisms**
Cube beamsplitters **Rhomboid prisms**
Dove prisms **Right angle prisms**
Equilateral prisms **Roof prisms**
Integrator rods **Wedge prisms**
Littrow prisms **Windows**
Mirrors

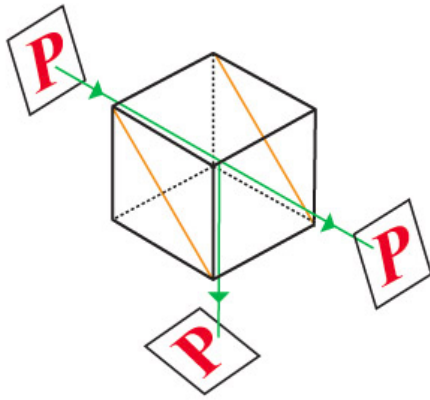
Corner Cube Retro-Reflector



While a mirror only reflects a ray or beam back at the normal angle of incidence, a corner cube prism, with its three internal reflections, can reflect it back onto itself - regardless of the prism's orientation. Because they work even at very large angles of incidence, corner cubes are valuable in applications where it's difficult or time-consuming to attain precision alignment. Angular tolerance ± 1 arc second, surface quality 20/10, surface flatness $\lambda/10$, dimensional tolerances $\pm .002$ ".

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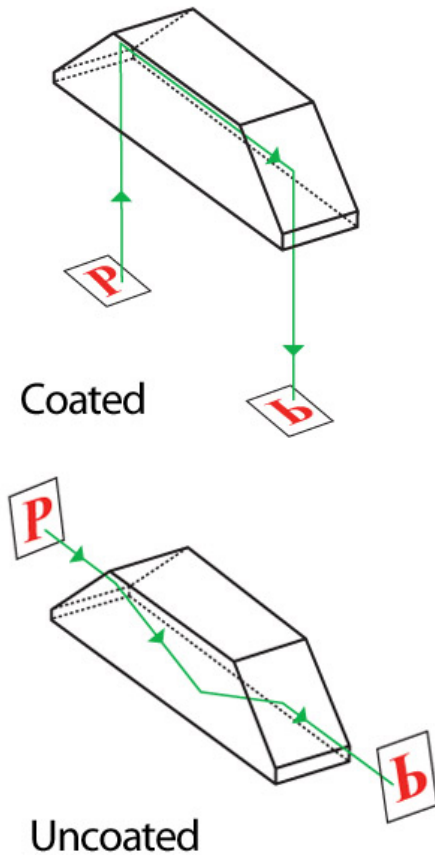
Cube Beamsplitters



These optical components are made by cementing two precision right angle prisms together and covering their hypotenuse surface with an interference coating. (Absorption loss caused by the coating is minimal.) On average, nearly 50% transmission and reflection can be produced, although it is partially polarized. In general, material is BK7, angle tolerances to < 1 arc second, flatness to $\lambda/10$, surface quality 20/10, dimensional tolerances $\pm .002$ ".

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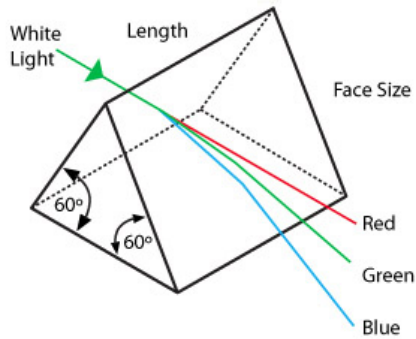
Dove Prisms



If you look through a dove prism as it rotates around a longitudinal axis, the image rotates through twice the angle that the prism does. This performance can be optimized by using collimated light. In imaging systems, dove prisms can be used to view areas behind the camera or around corners. They can also produce a split image, although the scenes are displaced from each other. Angular tolerance ± 1 arc minute, surface quality 40/20, surface flatness $\lambda/2$, dimensional tolerances $\pm .002$

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Equilateral Prisms



Also called dispersing prisms, equilateral prisms have three equal 60° angles. Angular tolerance ± 5 arc minutes, surface quality 60/40, surface accuracy $\lambda/10$, dimensional tolerances $\pm .002''$.

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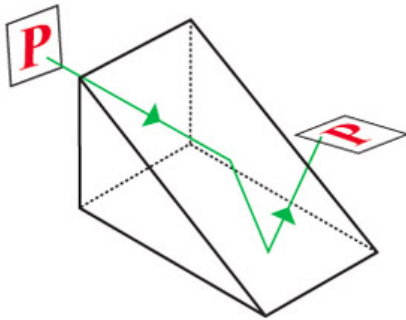
Integrator Rods



Also called light pipes, these rods deliver very even light. They are used to illuminate DLP™ and other optical system displays in rear projection televisions, home theaters, business conference projectors, and digital cinema. While we generally fabricate these rods from fused silica, other optical materials may also be used. Angular tolerances ± 20 arc minutes, surface qualities 40/20, surface flatness to 2 waves, dimensional tolerances to $\pm .002''$.

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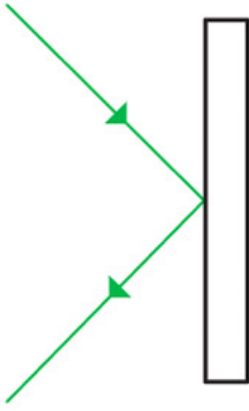
Littrow Prisms



These prisms are commonly used in laser cavities to limit lasing to a specific wavelength. For a given wavelength, the refracted ray entering the prism travels normally to the reflectively coated exit face, then back along its original path. Uncoated Littrow prisms are used for image dispersion. Angular tolerance ± 3 arc seconds, surface quality 40/20, surface accuracy $\lambda/10$, dimensional tolerances $\pm .002''$.

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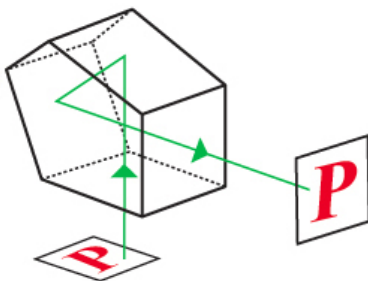
Mirrors



Made to the same quality standards as PG&O precision optical windows, our highly accurate mirrors feature a reflective coating and a protective overcoat. Ideal for imaging systems, laser applications, holography and optical path folding, they also make superb reflectors for autocollimating testing. We offer a full range of thin film coatings, from protected aluminum, silver and gold to a wide variety of dielectric choices.

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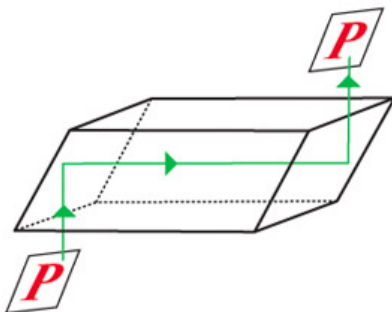
Penta Prisms



These five-sided prisms deviate beams by 90 degrees, independent of the prism's orientation - without inverting or reversing the image. Due to geometry, the reflecting surfaces must be aluminized. Penta prisms are often used to shorten the length of an instrument's optical path. All dimensions are in mm. Angular tolerance ± 2 arc seconds, surface quality 20/10, surface accuracy $\lambda/8$, dimensional tolerances $\pm .002$ ".

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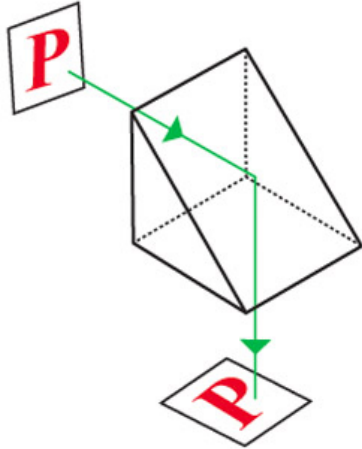
Rhomboid Prisms



Used in imaging applications to displace a laser beam without changing its direction or inverting the image. The lateral displacement in a rhomboid prism is equal to the length of the prism ("A" dimension). Due to the high tolerance angles of our rhomboid prisms, output and input beams remain parallel to within two arc seconds - making them ideal for demanding displacement requirements. Angular tolerance ± 2 arc seconds, surface quality 20/10, flatness $\lambda/10$, dimensional tolerances $\pm .002$ ".

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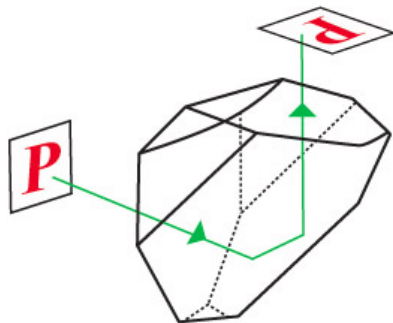
Right Angle Prisms



Commonly used to create a 90° bend in the light path, these prisms present images two ways depending on their orientation. In the first, images will be inverted but positioned correctly left to right. Rotate the prism 90°, and images will be right side up, but transposed horizontally. Several right angle prisms can be combined to achieve image/beam displacement. Angular tolerance ± 2 arc seconds, surface quality 20/10, surface accuracy $\lambda/10$, dimensional tolerances $\pm .002$ ".

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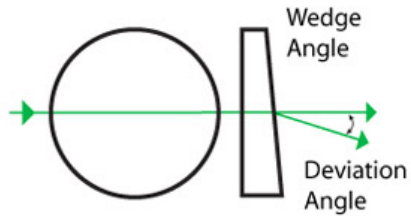
Roof Prisms



Also called an Amici or right angle roof prisms, these optical components invert the image and bend the line of sight through a 90° angle. Roof prisms make superb prism diagonals for optical systems, spotting scopes, and any optical instrument where it is useful to take an inverted image, right it, and bend it through a 90° angle to maintain the correct visual orientation. 3 arc second resolution, angular tolerance ± 5 arc minutes, surface quality 40/20, surface accuracy $\lambda/4$, dimensional tolerances $\pm .002$ ".

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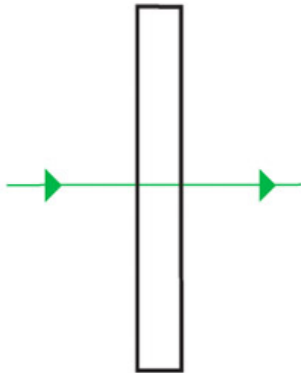
Wedge Prisms



Individually, a wedge prism can be used to bend a laser beam to a set angle. In tandem, these prisms can serve as an anamorphic pair for correcting the elliptical shape of diode outputs or steering a beam anywhere within a circle described by the full angle 4θ , where θ is the deviation from a single prism. Beam steering, done by rotating the two prisms independently, is generally used in imaging applications to scan a beam to different locations. Angular tolerance ± 1 arc minute, surface quality 60/40, surface accuracy $\lambda/4$, dimensional tolerances $\pm .002$ ".

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Windows



PG&O windows are optimally suited to applications demanding minimal deviation in the transmitted beam. Commonly offered in BK7 or Fused Silica, they may be ordered in a range of other optical materials as well. We can achieve a parallelism specification of < 1 arc second and flatness to $\lambda/20$. Tolerances are typically held to $\pm .001$ " and surface quality to 10/5.

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