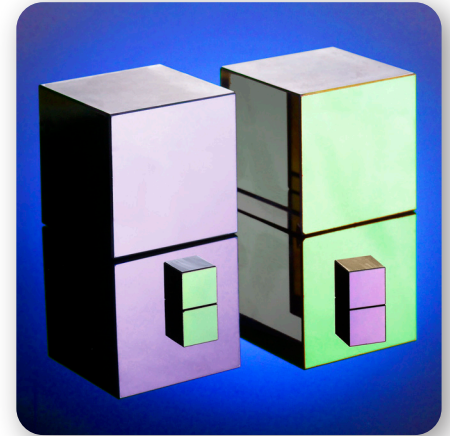


Silicon Polarizing Beamsplitter Cubes for High Power, Mid-Infrared Lasers

These silicon polarizing beamsplitter cubes offer an exceptional mix of broad bandwidth operation throughout the mid-infrared (2 μm to 6 μm), together with high laser damage threshold, high transmission (>95%) and high extinction ratio (>100,000:1). The extinction ratio can even be extended to greater than 1,000,000:1 over narrower spectral ranges. These polarizing beamsplitter cubes are available anywhere in the 1 mm to 75 mm size range.

The laser damage threshold for these devices is only limited by the bulk material, and is typically in the 1.5 J/cm² range, (for a 75 ns pulse at 2.05 μm). This is because these cubes utilize ion beam sputtered (IBS) coatings, and are assembled using REO's proprietary Activated Covalent Bonding (ACB™) technology, rather than through adhesive bonding or optical contacting. The elimination of any organics or glues from the beam path yields very high laser damage threshold and avoids internal optical absorption. Furthermore, the ACB™ technique produces a much stronger bond than any adhesive, and even optical contacting. This provides exceptional environmental stability, allowing operation over an extremely wide temperature and humidity range, without any shift in spectral response. It also makes these cubes mechanically durable, and insensitive to shock, vibration and high g forces. As a result, these optics are suitable for use anywhere from cryogenic environments to industrial, military, and spaceborne applications.

These polarizing beamsplitter cubes are primarily intended for use with mid-infrared coherent sources such as optical parametric oscillators (OPOs) and quantum cascade lasers (QCLs). They are well-suited to applications in IR countermeasures, remote sensing and industrial gas detection and analysis. Moreover, a scalable manufacturing process makes them cost competitive, particularly in high production volumes



Typical Specifications

Materials	Silicon
Wavelength Range	2 μm to 6 μm
Transmitted wavefront distortion (@ 632 nm)	$\lambda/10$
Transmission	>95%
Transmitted extinction ratio (Ts/Tp)	>100,000:1
Laser Damage Threshold	1.5 J/cm ² (for a 75 ns pulse at 2.05 μm)
Pyramidal error	1 arc minute
Temperature range	-196 °C to 400 °C
Humidity range	0 to 100%
Size range	1 mm to 75 mm
Surface Quality	20-10
Clear Aperture	90%