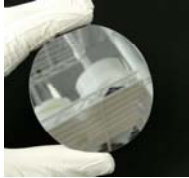


## NEW PRODUCTS & CAPABILITIES FOR 2009



### Silicon etalons and ultra-flat wafer polishing

PPC has successfully developed advanced polishing, testing and coating techniques for optical grade silicon material. Thickness measurements taken with our laser-based, NIST-traceable metrology system confirm total thickness variations less than 15nm across a 50mm diameter - a parallelism of < 0.1 arcseconds! Custom etalons, filters and wafers are available coated or uncoated with surface quality as low as 20/10 in sizes from 1.5 x 1.5 mm<sup>2</sup> to 100mm diameter.

### High-energy broadband laser mirrors for visible (400-700 nm)

PPC's broadband visible dielectric coating covers a broad wavelength range with > 99% reflectivity, independent of both incident angle and polarization. Our high-energy ion-beam-sputtering (IBS) process results in durable, dense, dielectric films that have superior reflective and mechanical properties in addition to being easy to clean, scratch resistant and insensitive to moisture and environmental changes.

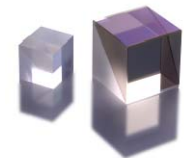


### Core drilling and laser marking

PPC has added both core drilling and laser marking of individual substrates and finished components to our growing list of in-house manufacturing capabilities. These processes increase our flexibility and ability to respond quickly to customer requirements for non-standard diameters and discrete part numbers and serialization for research and OEM applications.

### High-energy laser-line polarizing beamsplitter cubes in 1" standard size

PPC has expanded our series of epoxy-free broadband and laser-line polarizing beamsplitter cubes by adding a standard 1.0" version at 1064nm. With an extinction ratio of > 1000:1, LDT of > 12J/cm<sup>2</sup> and TWD <  $\lambda/10$ , our cubes outperform anything else currently available off-the-shelf. Custom versions are available from 266nm to 2200nm in sizes from 1 mm<sup>3</sup> to > 25 mm<sup>3</sup>.



### Ti:Sapphire, sapphire and phosphate glass polishing

In addition to recent advancements in polishing and bonding of optical grade silicon, PPC has also completed development of advanced polishing processes for phosphate, sapphire and Ti:sapphire materials. Despite being considered difficult materials to polish, we have successfully manufactured plano surfaces of up to 2" in diameter to  $\lambda/10$  peak-to-valley flatness with 10-5 surface quality and RMS surface roughness of less than 6 angstroms.

### Expanded materials list available for CADB™ epoxy-free bonding

PPC's patent-pending Chemically Activated Direct Bonding™ (CADB™) technology is an exceptionally durable and reliable process that results in epoxy-free optical paths that are ideal for monolithic optical devices and composite laser assemblies. Materials that are now offered for optical bonding include silicon, KTP, crystal quartz and sapphire as well as previously available materials such as fused silica, spinel, zerodur® and doped and undoped YAG.

