



# Applied Physics, Inc.

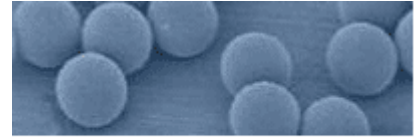
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## Nano Particle Technology

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### PSL SPHERES, POLYSTYRENE LATEX BEADS, PARTICLES

PSL spheres and polystyrene latex beads are used for size calibration of aerosol particle sizing instruments and SSIS (Surface Scanning Inspection System) tools, also known as Wafer Inspection Systems. PSL Spheres are available in DI Water Solution at 1% concentration below 2 micron in diameter and < 1% concentration from 2 microns to 160 microns.



PSL Spheres

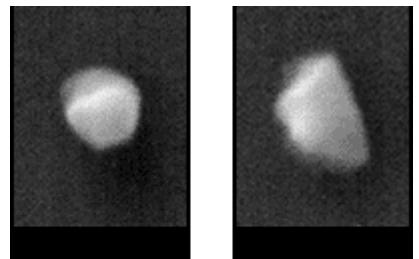
Aerosol instruments such as laser particle counters require size calibration down to and below 100nm (nanometers); and up to 10 microns. Surface inspection tools, such as wafer particle inspection tools from KLA-Tencor, KLA-Tencor SP1, KLA-Tencor SP2, KLA-Tencor SP3, KLA-Tencor SP5, KLA-Tencor SPx, Hitachi, Topcon require size calibration and have used PSL Spheres for many years in size calibration from 20nm up to 5um.

PSL Nanosphere Size Standards are uniformly sized, polystyrene latex spheres calibrated within nanometers of accuracy using NIST traceable methodology. One nanometer is equivalent to 0.00000001 micron ( $\mu\text{m}$ ) or 10 angstroms. Polystyrene Latex spheres have a density of 1.05 g/cm<sup>3</sup> and an index of refraction of 1.59 at 589nm (25°C).

- Uniform latex spheres are available in precise sizes between 20nm to and 160 microns
- Sphere diameter is calibrated with linear dimensions transferred from NIST SRM standards
- Polystyrene Latex spheres reduce the response of particle counters during calibration
- PSL Spheres are packaged in DI Water suspensions in 15mL bottles with drip tip and sealable lid
- PSL Spheres can be mixed with DI Water Solutions to dilute the heavy concentrations in the bottle
- Each polystyrene latex bottle is packaged with a lot-number for service and support

PSL Spheres are provided in 15ml bottles with 1% or less concentrations in DI Water. Another PSL Sphere product is provided in 50ml bottles with concentrations of 1E10 in DI Water; so that the PSL Sphere solution can be shaken up and poured directly into a sonication device or nebulizer for immediate use in aerosol instrument size calibration and surface size inspection calibration.

More and more particle inspection tools, laser particle counters, Surface Scanning Inspection Instruments, SSIS, SEMs, TEMs, etc. require more robust particles for size calibration, such as SiO<sub>2</sub> particles. PSL Spheres and SiO<sub>2</sub> have nearly the identical refractive index and calibration curve, but SiO<sub>2</sub> can stand up to the increased laser power of the instruments being produced today.



SiO<sub>2</sub>

Si

SEM images of process particles taken using the SMART-200 Tool.