



**Thermo Scientific
Size Standards and Count Controls**

Thermo Scientific NIST traceable size standards are used in the development, standardization and validation of most particle counting and sizing instruments. The particles are traceable to the Standard Meter through the National Institute of Standards and Technology (NIST), enabling labs to demonstrate the traceability of their analytical methods as required by ISO, ANSI/NCCL Z540, GMP/GLP and other standards and regulations.

Our count controls are ideal for calibrating or checking the performance of laser particle counters used in cleanrooms and other contamination monitoring applications. The particle diameters provide third party traceability of calibration procedures to national and international agencies through an unbroken chain of measurements with specified uncertainties.

Thermo Scientific NIST Traceable Size Standards

2000 Series Uniform Polymer Particles

- 15 mL • 1% solids • Nominal diameter ~ 5 µm - 40 µm

The 2000 Series meets the need for NIST traceable size standards that have slightly wider distributions than our monodisperse 3000 or 4000 Series size standards. The 2000 Series is suitable for laser diffraction and other methods for analyzing wide size range materials. The wider distribution provides light scatter across a range of detectors, resulting in a more repeatable measurement. The material is composed of polystyrene cross-linked with divinylbenzene to provide durability and chemical stability.

3000 Series Monodisperse Particles

- 15 mL • 1% solids • Nominal diameter ~ 20 nm - 900 nm

The 3000 Series is comprised of highly uniform sulfate particles calibrated in nanometers with NIST traceable methodology. They are ideal for calibrating electron and atomic force microscopes, and are also used in light scattering studies and colloidal systems research. The 20 nm to 900 nm range of diameters is convenient for checking the sizes of bacterial, viral, ribosomal and sub-cellular components. Packaged as aqueous suspensions in 15 mL dropper-tipped bottles, the concentrations are optimized for ease of dispersion and colloidal stability.

4000 Series Monosized Particles

- 15 mL (or 1 gram for 200 - 1000 µm) • 1% - 4.8 % solids (for 1.0 µm-160 µm)
- Nominal diameter ~ 1.0 µm - 1000 µm

The nominal diameter of the 4000 Series is calibrated with our NIST traceable microscopy methods, while the size distribution and uniformity is measured by electrical resistance analysis or optical microscopy. These particles with a nominal diameter from 1 µm to 160 µm are made from polystyrene, and are packaged as aqueous suspensions in 15 mL dropper-tipped bottles at an optimum concentration for dispersion, handling and dilution. Particles from 200 µm to 1000 µm are dry.

8000 Series Silica Particles

- 15 mL • 2% solids • Nominal diameter ~ 0.5 µm - 1.6 µm

The 8000 Series is designed for applications requiring monodisperse inorganic particles. Like glass, silica particles have a much higher density than polystyrene particles. Because they are opaque, they provide more contrast than polymer particles in optical and electron beams. They are calibrated and certified with NIST traceable mean diameters, are suitable for a wide variety of particle measurement applications, and are packaged in pure, deionized water without any surfactants.

9000 Series Borosilicate and Soda Lime Glass Particles

- 1 gram • Nominal diameter ~ 2 µm to 2000 µm

The 9000 Series is available as uniform particles of borosilicate or soda lime glass in a range of discrete sizes from 2 µm to 2000 µm. Calibrated and certified with NIST traceable mean diameters, they are suited for particle measurement applications. They also have a better tolerance to chemicals and solvents, and a higher mechanical and thermal stability.

Chromosphere-T™ Certified Size Standards-Black and Red (Dry)

- 1 gram • Nominal diameter ~ 50 µm to 500 µm

ChromoSphere-T polymer particles are internally and deeply dyed with red or black dyes. The intense colors result in very high contrast and visibility relative to most background materials. They are available as dry powders and, if desired, can be easily suspended in aqueous media.

Dri-Cal™ Particle Size Standards (Dry)

- 1 gram • Nominal diameter ~ 5 µm - 100 µm

Dri-Cal particles are used for calibrating particle sizing and counting instrumentation that require dry particles. They are packaged in dropper-tipped vials in 1 gram quantities, enabling the user to dispense the particles directly into the sampling chamber. They are not suitable for dispersion in liquid media.

Surf-Cal™ Particle Size Standards

- 50 mL • Certified Peak Diameter ~ 0.047 µm - 3.04 µm

Surf-Cal meets SEMI standard guidelines for calibrating scanning Surface Inspection Systems (SISS). Available sizes include those considered as critical sizing nodes as defined by the International Technology Roadmap for Semiconductors (ITRS). Surf-Cal simplifies the job of preparing calibration wafers in your facility.

3K/4K Series-Particle Counter Size Standards

- 15 mL • Nominal diameter ~ 0.1 µm - 100 µm

With diameters traceable to NIST, the 3K/4K Series of particles are suspensions of monodisperse polystyrene spheres designed for use in the calibration of airborne or liquid particle counting systems. They are prepared as low residue aqueous suspensions for minimal background interference, and are also precisely diluted for immediate use in laser particle counters with minimal time-consuming adjustments of concentration.

Thermo Scientific Count Controls

Pharm-trol™

- 6 x 25 mL, 20 x 25 mL • Nominal diameter ~ 15 µm

Pharm-trol count controls contain NIST traceable size standards with a measured particle count. It was developed for manufacturers of parenteral drugs and ophthalmic solutions seeking interim verification of USP <788> and <789> (Particulate Matter in Injections and Particulate Matter in Ophthalmic Solutions).

Validex™

- 500 mL • Nominal diameter ~ 5 µm - 10 µm

Validex count controls contain NIST traceable polymer particles packaged in ultrapure water at concentrations ideal for use in validating the performance of liquid particle counters in drinking water applications. The composition of the suspension has been optimized to promote dispersion of the particles.

Count-Cal™

- 6 x 25 mL • Nominal diameter ~ 2 µm - 70 µm

Count-Cal count controls provide a cost effective, convenient way to validate liquid particle counters. Packaged in single-use bottles and intended to be sampled directly from the bottle, Count-Cal eliminates the need for serial dilutions and extensive sample handling, thereby minimizing contamination. The diameters are traceable to NIST.

Ezy-Cal™

- 100 mL • Nominal diameter ~ 2 µm - 70 µm

Ezy-Cal count controls are ready for use and are ideal for validating liquid particle counters. A magnetic stir bar for resuspension is included in each bottle for clean, convenient and direct sampling by instruments. The aqueous suspension medium contains a combination of dispersing agents that helps keep the particles from clumping or sticking to flow surfaces in the particle counter. The diameters are traceable to NIST.

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