Particle Deposition System

The most advanced system available for producing wafer contamination standards

A Comprehensive Solution for Inspection and Qualification

The advanced 2300G3 Particle Deposition System sets the standards for wafer inspection and metrology equipment that will help increase yield of leading-edge devices for years to come, yet this complete system can be used now to meet today's measurement needs, including:

- Incoming bare wafer inspection/qualification
- Process tool qualification, process learning, and monitoring
- Blanket film monitoring
- Inspection tool development and qualification
- Traceable calibration and matching legacy wafer calibration standards
- Determining inspection sensitivity for proprietary films

Automation at Your Fingertips

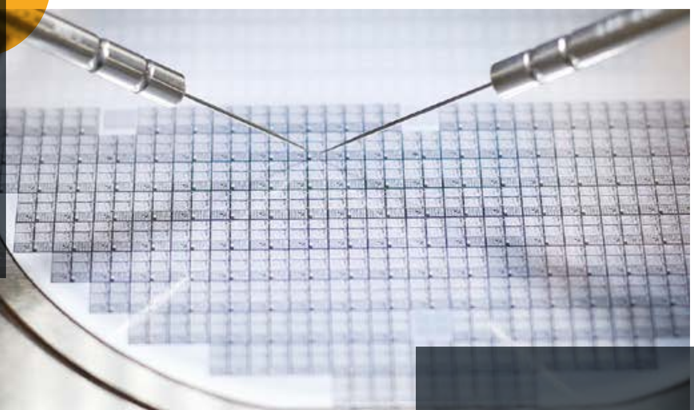
for Production of Superior Wafer Calibration Standards

Accuracy and Traceability
The Model 2300G3 Particle Deposition System is calibrated for highly accurate control of modal diameter with SI traceability for all deposits of PSL spheres and MSP NanoSilica™ Size Standards. Produce state-of-the-art wafer calibration standards for demanding applications with confidence.

Precision and Repeatability
The Model 2300G3 controls the modal diameter of deposited particles with sub-nanometer repeatability using advanced Differential Mobility Analyzer (DMA) control. The width of the size distribution selected by the DMA can be reduced to a sliver of the source distribution for optimal size distinction. Spot diameter can be adjusted with sub-millimeter precision via continuous control of deposition flow and voltage. High repeatability of deposited particle count allows adjustment of absolute count for alignment with any inspection system.

Flexibility and Ease of Use
With the capacity for 16 particle suspensions and a particle size operating range exceeding two orders of magnitude, virtually any wafer inspection tool calibration curve can be generated via deposition with a single recipe. Recipe variables and configuration constants enable a wide variety of recipes to be executed without constraint. Manually-loaded systems support deposition on three wafer sizes (150, 200, 300mm) covering the needs of any modern fab or OEM factory.

Quality Control and Convenience
Depositing wafers with an in-house tool eliminates contamination issues introduced by shipping and enables precise control over the end product, including the exact type of substrate used for the standard. Wafer standards can be produced within hours, whereas procurement from an outside deposition services supplier can take months. Ready access to a tool for research purposes is another great convenience.



Today's Standards for Tomorrow's Yield

The Model 2300G3 Particle Deposition System deposits PSL spheres, MSP NanoSilica™ Size Standards, and other SiO_2 particles to produce standards with SI traceability for calibrating and qualifying wafer inspection tools used in semiconductor manufacturing. Deposited particle size and count are controlled with unparalleled accuracy and repeatability to ensure consistency from substrate to substrate.

The Model 2300G3 also deposits particles generated from MSP Process Particles™ Suspensions to help characterize the material dependence of inspection/ metrology tool response to defects.

This advanced system is easy to operate with automated recipe control. Robotic wafer handling in the fully-automated version (2300G3A) allows up to 25 wafers to be processed in a single control job. The 2300G3A may be integrated with the factory host for wafer loading by the fab's automated material handling system (AMHS).

Particle size distributions can be measured in quick succession and analyzed to predict how changes in recipe diameters affect deposited size distributions, providing users with more precise control over deposited peak diameters and size distribution widths. Versions are available with deposition capability down to 10nm, 20nm, or 30nm.

Features and Benefits

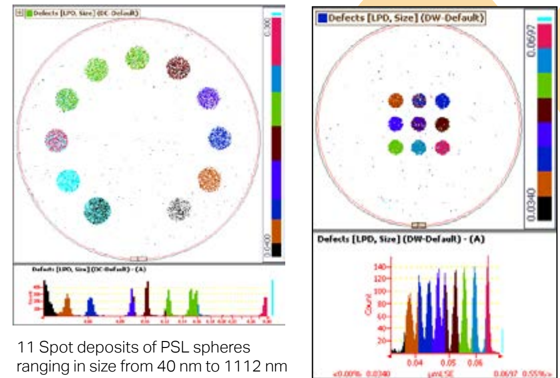
- Full (blanket), Spot, Arc, and Ring deposit patterns
- Precise recipe control of deposited particle size
- Nanoparticle atomization for clean particle generation to 10nm
- DMA size classification for narrow size distribution selection
- Minimization of particle clusters and residue particles
- Recipe control of deposit pattern width
- Recipe, deposition, and suspension analysis reports
- Ergonomic design
- Worldwide service and support

Specifications

Particle Deposition System Model 2300G3

	Model 2300G3M (Manually Loaded)	Model 2300G3A (Fully Automated)
Supported Substrates	150 mm wafers 200 mm wafers 300 mm wafers	200 mm wafers (optional) 300 mm wafers
Dimensions* (W x D x H)	998 x 1637 x 1960 mm (39.3 x 64.4 x 77.2 in)	2145 x 1637 x 1960 mm (84.4 x 64.4 x 77.2 mm)
Weight**	520 kg (1143 lbs)	1190 kg (2618 lb)

* Orientation: Keyboard/monitor on front side of tool. Depth includes keyboard in open (down) position. Height does not include light tower or optional EFEM air intake on 2300G3A.
** Weight of 2300G3A doesn't include optional EFEM air intake with chemical filters.



11 Spot deposits of PSL spheres ranging in size from 40 nm to 1112 nm

9 Spot deposits of MSP NanoSilica™ Size Standards ranging in size from 43 nm to 75 nm

All versions can support deposition on 200mm and 300mm wafers

Applicable to Both Models

Particle Types
- PSL spheres
- MSP NanoSilica™ Size Standards
- MSP Process Particles™ Suspensions

Particle Size Range (Three Versions):
- 10nm to 2000nm, DMA-classified
- 20nm to 2000nm, DMA-classified
- 30nm to 2000nm, DMA-classified

Particle Size Accuracy
- ±0.5nm ($D_p \leq 50$nm)
- ±1% of peak diameter ($D_p > 50$nm)

(Not including uncertainty intrinsic to the particle reference materials used for calibration of the DMAs.)

To Order

Particle Deposition System

Specify	Description
2332	2300G3A, 20nm capability
2333	2300G3M, 20nm capability
2334	2300G3A, 10nm capability
2335	2300G3M, 10nm capability
2337	2300G3M, 30nm capability

Optional Accessories

Specify	Description
2300HOST	2300G3A Host Connectivity Option

Contact us for automated wafer handling (EFEM) options

Up to 16 particle suspensions can be loaded for processing.

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MSP - Visit our website **www.tsi.com/msp** for more information.

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