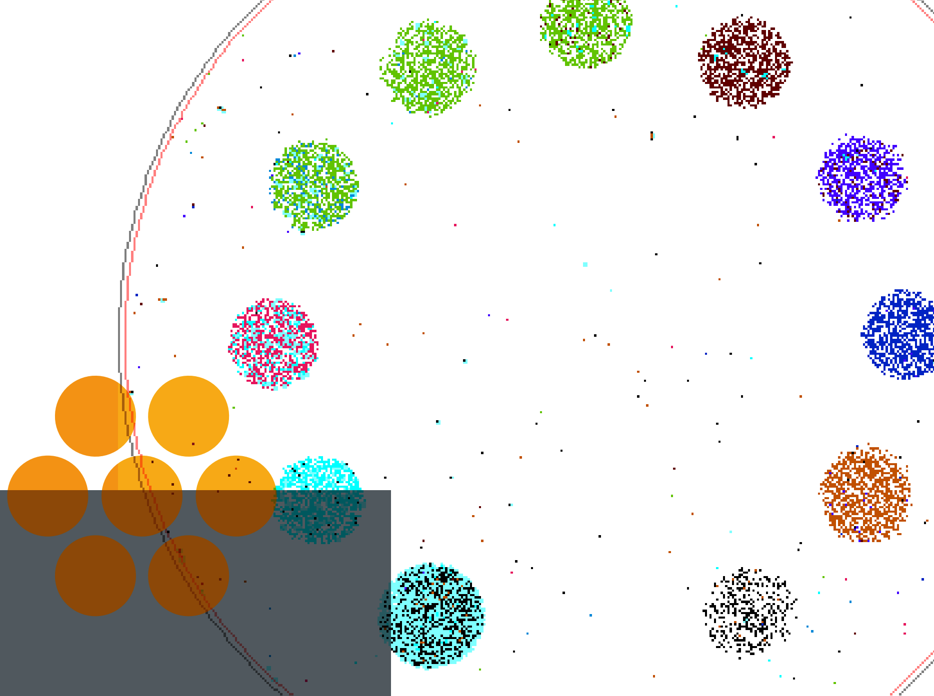
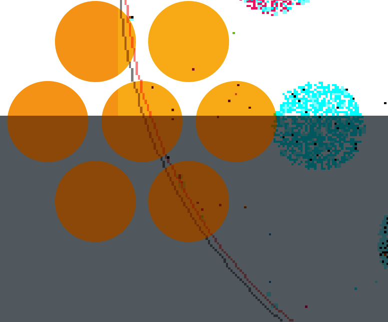




Wafer & Photomask Surface Defect Contamination Standards

Calibration Standards

MSP provides superior particle depositions for developing, qualifying, and calibrating advanced wafer and photomask surface inspection systems.

Accuracy and Traceability
Differential Mobility Analyzer (DMA) technology precisely controls the modal (peak) of, and variation in, deposited particle diameter. DMAs are calibrated with SI traceability using the best available particle size reference materials, including PSL spheres from NIST. Calibrations are monitored on a weekly basis.

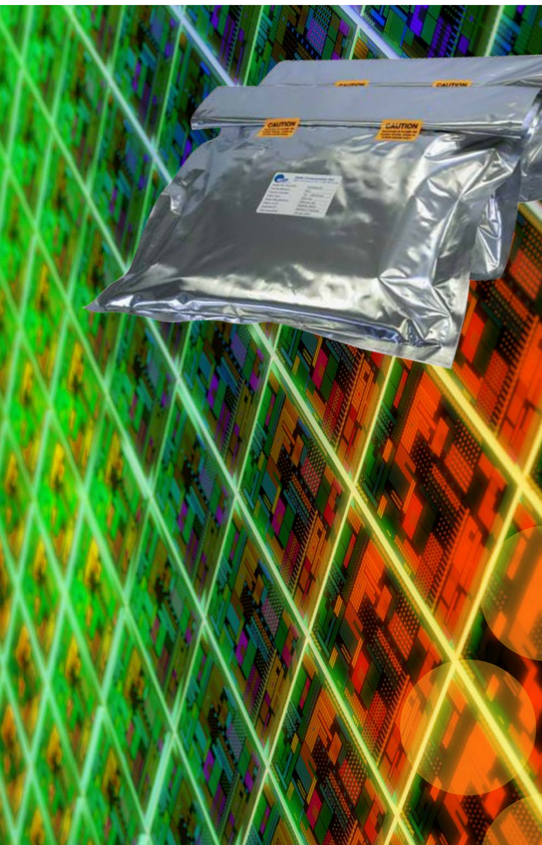
Precision and Repeatability
Particle size (10nm to 20µm) and count (400 to >100,000 particles per deposit) are extremely repeatable from substrate to substrate. Spot diameter (typically 10-30mm) and spot location are consistent from deposit to deposit (adjustable with sub-millimeter precision).

Faster Learning Cycles
MSP leads the industry in substrate processing speed. The faster the turnaround, the faster your learning cycle, and the faster your product can be developed.

Certification and Quality Control
Deposited 200mm and 300mm wafers can be inspected with an in-house scanning surface inspection system (SSIS). For photomasks (reticles) and other substrates, MSP deposits particles on a witness wafer and inspects the deposits with the SSIS to qualify the process. Every substrate is handled with extreme care and packaged with our signature triple-wrap packaging, preventing contamination during transport.

Customization
MSP will quote and provide a draft recipe for a standard according to your requirements for particle size and composition, deposit count, and deposit pattern type, size, and position on the substrate of your choice. Spot, Arc, Ring, and Full (Blanket) pattern types are available. Over 100 size standards are stocked (10nm to 20µm), and more than 15 particle materials are available.

MSP's signature triple-wrap packaging



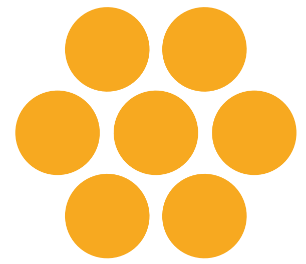
Comprehensive Particle Deposition Services

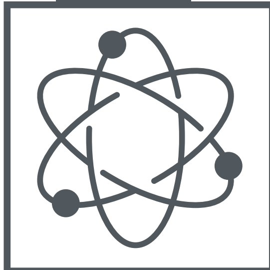
MSP provides certified Wafer and Photomask Contamination Standards for developing, qualifying, and calibrating wafer and photomask inspection systems. NIST traceable particles of specified size, composition, and count are deposited on a bare silicon wafer or your substrate of choice, including wafers, or photomasks (any type). Particles can be deposited on bare, film, and patterned wafers from 100mm to 300mm - contact your MSP representative for more details.

MSP is a leader in the industry, providing advanced technology to cover customers' particle, calibration and contamination needs, including:

- Commercial particle deposition technology - 20+ years of experience with top-tier companies
- Surface inspection system calibration standards
- Particle suspensions (NanoSilica™ Size Standards, Process Particles™ Suspensions)

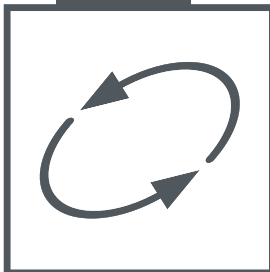
MSP Has Programs Developed For Your Needs





Dev-Dep™

- Designed around fast-paced R&D environment
- Accelerates product and process development
- Totally customized leading-edge solution
- Consult with industry experts



Qual-Dep™

- Customer specific part number
  - Simplified purchasing process
  - Defined specification and consistent deliverable
  - Advantageous pricing
  - Shorter lead-times
- Developed for repetitive needs

Cal-Dep™

- Designed for fab environment
- High-accuracy contamination standards with SI traceability
- Confirms to existing calibration standards and requirements
- Off-the-shelf options for next day shipment

Specifications

Wafer & Photomask Surface Defect Contamination Standards

Standard Substrates[1]

Substrate	Standard Sizes	Types Supplied by MSP	Types Supplied by Customer
Wafer (Circular)	150mm 200mm 300mm	Bare Silicon (Si) Notched	Bare Silicon (Si) Film Patterned
Photomask (Square)	6″ x 6″ x 1/4″ (6025)	Blank Optical	Blank Film Patterned Optical EUV

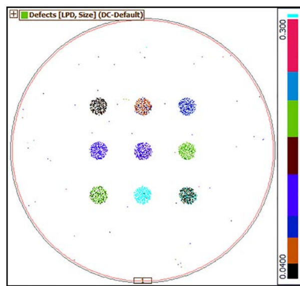
[1] Contact MSP for processing of Non-Standard substrates, including wafer sizes down to 100mm.

Particle Deposit Attributes

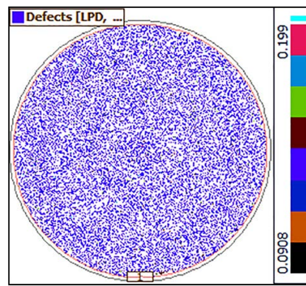
Attribute	Available Options or Ranges
Particle Type / Material	▪ PSL Size Standards ▪ SiO_2 Size Standards ▪ MSP Process Particles™ Suspensions[2] (AlF_3, Al_2O_3, Ni, Ru, Si, Si_3N_4, SiO_2, Sn, Ti, Ta, TiN, TiO_2, W, Y_2O_3)
Particle Size[3]	10 nm – 20 µm
Standard Particle Count	Minimum 400 particles per deposit
Pattern Width	Typically 10-30 mm. Range of Pattern Width (e.g., Spot Diameter) is dependent on Particle Size.

[2] Restrictions on particle size apply to all Process Particles™ Suspensions.
[3] Only PSL Spheres are available up to 20 µm.
SiO_2 Spheres are available up to 16 µm.

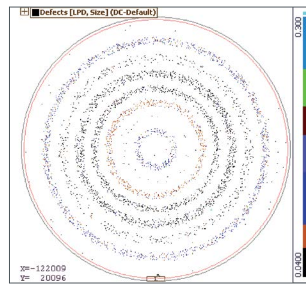
Pattern Type



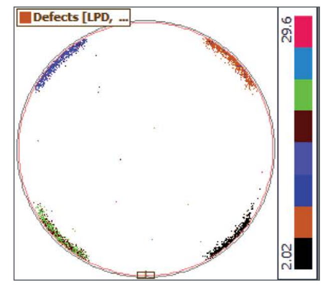
Spot Deposit



Full Deposition



Ring Deposition



Edge and Arc Depositions

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

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