CONTAMINATION

VLSI Standards

Silica Contamination Standards

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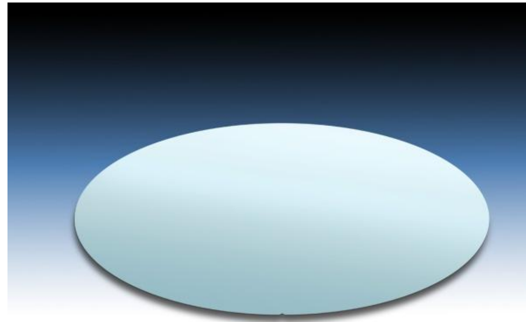
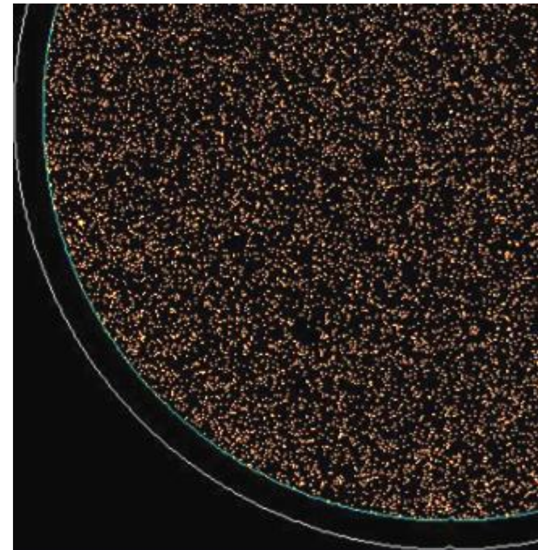
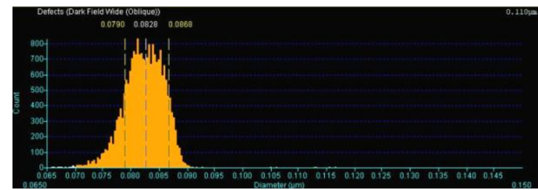
RAISE YOUR GLASS. The Silica Contamination Standard (SCS) is used to calibrate high-intensity UV tools which size and detect particles on the surface of bare silicon wafers. Use SCS to characterize particles, before particles characterize products.

Shown on the left is a Silica Contamination Standard, appearing as a bare wafer to the naked eye. On the right is a particle map and histogram of the same wafer acquired with a Scanning Surface Inspection System.







PRODUCT DESCRIPTION

The Silica Contamination Standard is built by depositing spherical silica spheres which have a very tight monodisperse size distribution. Damage resistant silica spheres are useful for the calibration and monitoring of instruments that measure and count particles with UV and DUV illumination. Available for the first time, silica particles retain their calibration properties from prolonged exposure to UV and DUV light, where other materials may degrade or deform. VLSI Standards supplies Silica Contamination Standards with a variety of sphere sizes in the range of 32 nm up to 1.5 micron.

The calibration certificate includes the approximate number of particles deposited on the wafer. Background contamination is kept at an extremely low level.

PRODUCT SPECIFICATIONS

- **SEMI Specification Silicon Wafers**
  300 mm and 450 mm diameter silicon wafers
- **Silica Spheres**
  From 32 nm up to 1.5 micron*
- **Traceability**
  Silica diameter traceable to SI

* Sizes in other ranges may be available. Please check with VLSI Standards.

Revision History

Revision	Date	Author	Changes / Comments
AA	12/9/12	E. Le Roy	Initial Release

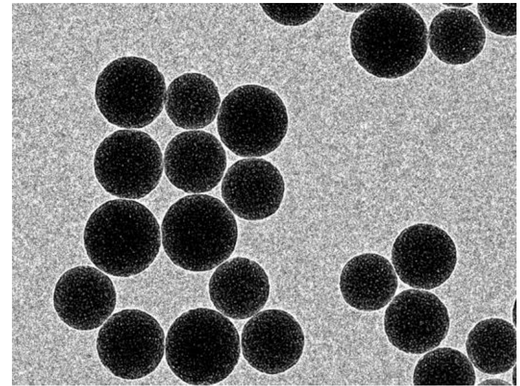
CONTAMINATION

VLSI Standards

Silica Solutions

CREATE YOUR OWN STANDARDS. The Certified silica solutions are used to generate calibration standards for your instruments and characterize your own process.

Pictured on the right is an SEM image of Silica Spheres of various sizes.



PRODUCT DESCRIPTION

VLSI Standards' silica solutions are resistant to UV/DUV wavelengths. The silica particles diameter is traceable to SI. The silica solutions are available in 14 sizes (32 nm to 1500 nm particles) and two volumes (15 mL and 50 mL).

VLSI Standards also offers optional deposition services to further support manufacturers as they replace PSL deposition with silica solutions to future-proof their chip and wafer inspection processes.

PRODUCT SPECIFICATIONS

- **Silica Spheres**
  From 32 nm up to 1.5 micron
- **Traceability**
  Silica diameter traceable to SI

Specifications subject to change.

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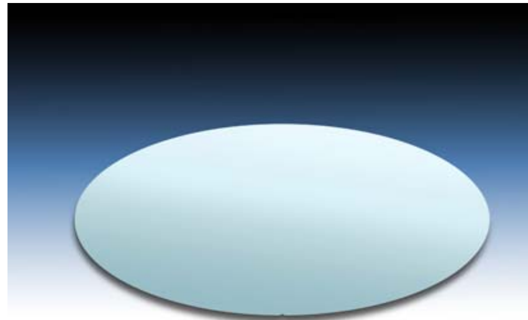
CONTAMINATION

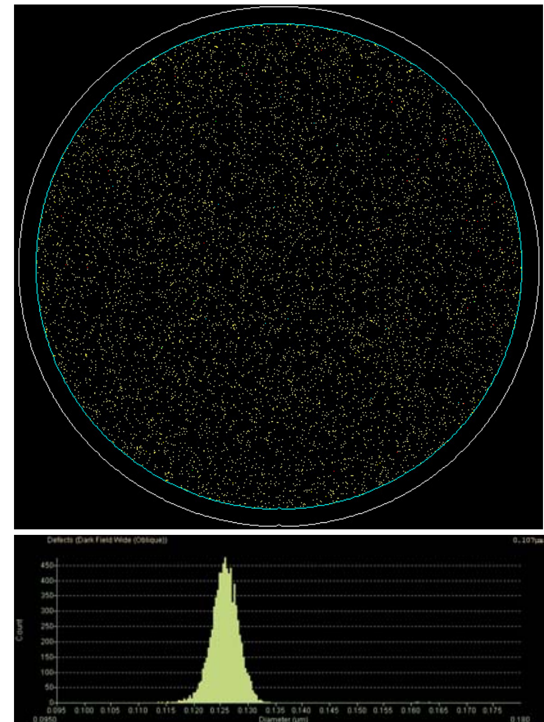
VLSI Standards

Absolute Contamination Standards

SMALL OR LARGE, FIND PARTICLES THAT COUNT. The Absolute Contamination Standard (ACS) is used to calibrate instruments which size and detect particles on the surface of bare silicon wafers. Use ACS to characterize particles, before particles characterize products.

Shown on the left is an Absolute Contamination Standard, appearing as a bare wafer to the naked eye. On the right is a particle map and histogram of the same wafer acquired with a Scanning Surface Inspection System.





PRODUCT DESCRIPTION

The Absolute Contamination Standard is built by depositing highly spherical polystyrene latex (PSL) spheres which have well-characterized optical properties and a very tight monodisperse size distribution. These parameters make PSL spheres a useful material for the calibration and monitoring of instruments that measure and count particles. VLSI Standards supplies Absolute Contamination Standards with a wide variety of traceable to SI Units through NIST sphere sizes in the range between 0.040 µm and 4.0 µm. Standards with smaller or larger sphere sizes may be special ordered.

The calibration certificate includes the approximate number of particles deposited on the wafer. This is not a traceable to SI Units through NIST value, as the Absolute Contamination Standard is designed to calibrate particle size, and not particle count. Background contamination is kept at an extremely low level and is defined on the measurement certificate. These characteristics of the standard ensure a highly monodispersed population of spheres on the substrate.

PRODUCT SPECIFICATIONS

- **SEMI Specification Silicon Wafers**
  100 mm, 125 mm, 150 mm, 200 mm, and 300 mm diameter silicon wafers
- **Polystyrene Latex Spheres**
  From 40 nm up to 4 micron*
- **Traceability**
  PSL diameter traceable to SI Units through NIST.

** Sizes in other ranges may be available. Please check with VLSI Standards.*

Revision ACS 041512
Specifications subject to change.

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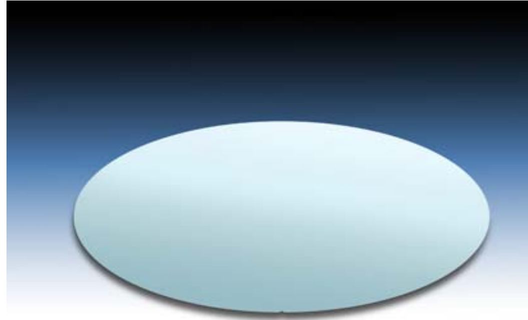
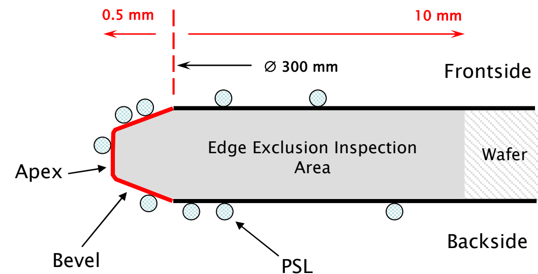
CONTAMINATION

VLSI Standards

Edge Contamination Standards

TAKE YOUR METROLOGY TO THE BRINK. The Edge Contamination Standard (ECS) is a bare silicon wafer that has microscopic latex spheres which have been spot deposited on the wafer's edge. The ECS is designed for particle size calibration of instruments that detect and size particles on the substrate's edge.





On the left is the Edge Contamination Standard which appears to the naked eye as a bare silicon wafer. Microscopic polystyrene latex spheres are deposited at four distinct spot locations along its edge at an arc length of approximately 25 mm, and 10 mm deep. On the right is a wafer cross section schematic of the ECS.

PRODUCT DESCRIPTION

VLSI Standards' solution for edge contamination metrology utilizes precise spot deposition of polystyrene latex spheres (PSL) onto four distinct regions on the substrate's edge. Each deposition area covers the top and bottom near edges, the top and bottom wafer bevels, and the apex or true edge of the wafer. This allows the user to perform both topside and backside inspections to check the complete sensitivity of the tool.

The PSL spheres deposited on the Edge Contamination Standard are highly spherical, have well-characterized optical properties and a very tight monodisperse size distribution. These parameters make PSL spheres a useful material for the calibration and monitoring of particle counting instruments. These standards come with nominal 0.5 µm, 1.0 µm, 2.0 µm and 5.0 µm PSL sizes. Approximately a few thousand particles are located in each deposited region.

Although VLSI provides you with the particle count value on the calibration certificate, the ECS is designed to calibrate particle size and tool sensitivity, and not necessarily particle count.

PRODUCT SPECIFICATIONS

- **SEMI Specification Silicon Wafers**
  200 mm and 300 mm diameter silicon wafers
- **Deposition Locations**
  From notch (0°): 35°, 145°, 205° and 325°
- **Polystyrene Latex Spheres**
  Nominal 0.5 µm, 1.0 µm, 2.0 µm and 5.0 µm diameter (all on one wafer)
- **Traceability**
  PSL diameter traceable to SI Units through NIST

Revision ECS 041512
Specifications subject to change.

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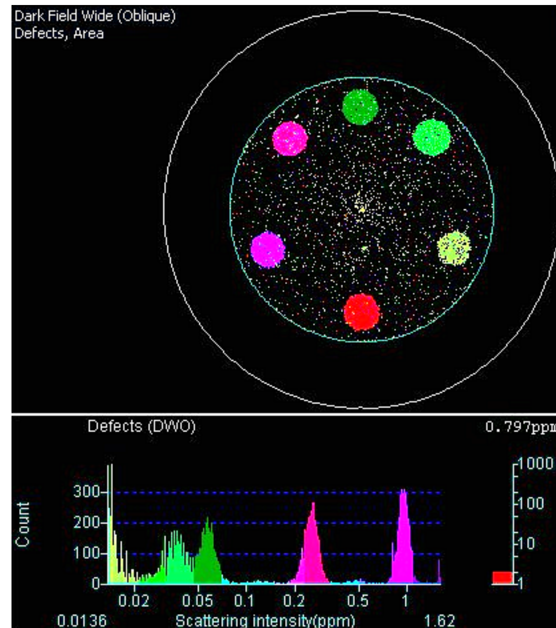
CONTAMINATION

VLSI Standards

Leopard Contamination Standards

SPOT PROBLEMS QUICKLY. The Leopard Contamination Standard (LCS) is used to calibrate instruments which size and detect particles over a range of values, on the surface of bare silicon wafers. Use it to characterize particles common to your process.

Pictured on the right is the map of a wafer which was deposited with PSL spheres of various sizes.



PRODUCT DESCRIPTION

Utilizing spot depositions, VLSI Standards places distinct groups of polystyrene latex (PSL) spheres onto the surface of bare silicon wafers. Standards are made containing a choice of 4, 5 or 6 homogenous spots, and are offered in incremental range from 0.050 µm to 3 µm.

Each spot is approximately 20 mm in diameter and contains approximately 5,000 spheres.

The Leopard Contamination Standard is designed to calibrate particle size, and not particle count. Background contamination is kept at an extremely low level and is described on the measurement certificate.

PRODUCT SPECIFICATIONS

- **SEMI Specification Silicon Wafers**
  200 mm and 300 mm diameter silicon wafers
- **Spots**
  4, 5 or 6
- **Polystyrene Latex Spheres**
  From 50 nm up to 3 micron*
- **Traceability**
  PSL diameter traceable to SI Units through NIST

** Sizes in other ranges may be available. Please check with VLSI Standards.*

Revision LCS 041512
Specifications subject to change.

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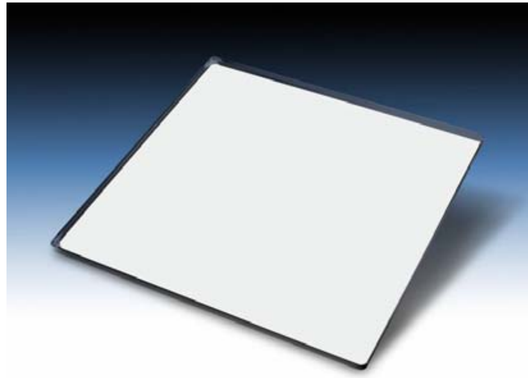
CONTAMINATION

VLSI Standards

Reticle Contamination Standards

SMALL OR LARGE, FIND PARTICLES THAT COUNT. The Reticle Contamination Standard (RCS) is used to calibrate instruments which size and detect particles on the surface of a reticle or its protective pellicle. Use ACS to characterize particles, before particles characterize products.

The Reticle Contamination Standard appears to the naked eye as a photomask blank. The reticle (or optionally its pellicle) is deposited with microscopic polystyrene latex spheres.



PRODUCT DESCRIPTION

The Reticle Contamination Standard is built by depositing highly spherical polystyrene latex (PSL) spheres which have well-characterized optical properties and a very tight monodisperse size distribution. These parameters make PSL spheres a useful material for the calibration and monitoring of instruments that measure and count particles. A range of traceable to SI units through NIST and other non-traceable PSL sizes or standards with smaller or larger sphere sizes may be special ordered.

Deposition may be performed on the reticle surface or on the surface of the pellicle, after mounting on the reticle. By request, front-side and/or backside particle deposition as well as pellicle mounting on front or back can be done. VLSI Standards performs full-substrate particle depositions or spot particle depositions with a wide variety of NIST-traceable sphere sizes down to 40 nm.

PRODUCT SPECIFICATIONS

- Substrates Available:
  Customer-supplied (any size), 125 mm x 125 mm or 152 mm x 152 mm: clear, chrome, half clear / half chrome
- Pellicles available
  Contact VLSI Standards
- Particle Sizes Available
  40 nm through 50 µm
- Traceability
  PSL diameter traceable to SI units through NIST

Revision RCS 041512
Specifications subject to change.

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