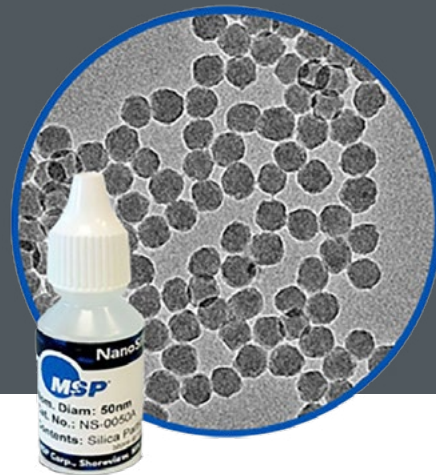




# NanoSilica™ Size Standards



## Concentrated aqueous suspensions of SiO<sub>2</sub> particles with highly uniform size distributions

NanoSilica™ Size Standards from MSP, a Division of TSI®, are ideally suited for producing high-quality calibration standards for the next generation of wafer and photomask inspection systems. They are available in nominal sizes ranging from 15 to 200 nm.

### Applications

- Wafer and reticle (photomask) inspection tool calibration
- Inspection tool development and qualification
- Incoming bare wafer inspection/qualification
- Blanket film monitoring
- Incoming reticle (photomask) inspection/qualification
- Production reticle (photomask) monitoring
- Process tool qualification and monitoring
- Particle counter calibration

### Benefits

- Easily discern modal (peak) diameter
- Avoid discrepancies due to differences between mean and peak diameter values
- Prepare diluted suspensions suitable for aerosol generation devices with relatively high or low efficiencies
- Create long-lasting calibration standards for state-of-the-art inspection tools
- Consume less material; save money
- Comes with a Certificate of Calibration and Traceability and a Safety Data Sheet (SDS) with handling and disposal instructions

### Features

- **Extremely uniform size distribution**  
Manufactured with a patented SiO<sub>2</sub> synthesis process, our NanoSilica™ Size Standards have size distributions narrower than commercially available PSL spheres.
- **Peak diameter measured with SI traceability**  
Allows yield-enhancement and metrology groups to establish traceability of their inspection and defect review methods in accordance with ISO 9000 standards and SEMI guidelines.
- **Stable when subjected to intense DUV radiation**  
MSP's SiO<sub>2</sub> particles will not degrade when exposed to DUV radiation, unlike PSL spheres, which can decrease in size.
- **Easy to use**  
NanoSilica particle suspensions are available in dropper-tip bottles for convenience when mixing suspensions with appropriate number concentrations for your applications.
- **High particle concentration**  
Some applications require high number concentrations. MSP's particle concentrations are one of the highest in the industry.

# Specifications

## Nanosilica™ Size Standards

### Standard Offerings

Other sizes may be available upon request.  
Please contact MSP™ for more information.

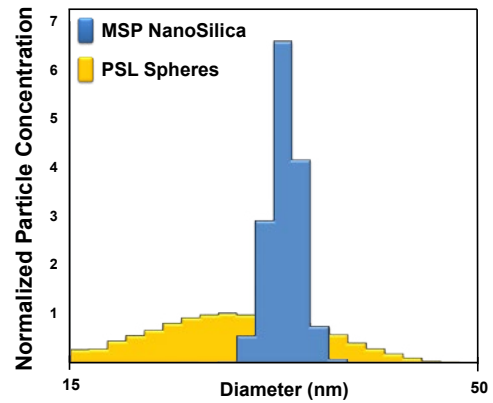
Model (Starting with 2260-02-)	Catalog Number	Nominal Particle Diameter [nm]	Certified <sup>1</sup> Peak Diameter [nm]	Approx. Size Dist. Width, RFWHM <sup>2</sup>
1044	NS-0015A	15	14-16	13%
1046	NS-0018A	18	17-19	12%
1047	NS-0020A	20	19-21	11%
1073	NS-0022A	22	21-23	11%
1048	NS-0024A	24	23-25	10%
1074	NS-0026A	26	25-27	9%
1075	NS-0027A	27	26-28	9%
1049	NS-0030A	30	29-31	8%
1079	NS-0032A	32	31-33	7%
1062	NS-0035A	35	34-36	7%
1076	NS-0037A	37	36-38	6%
1051	NS-0040A	40	39-41	6%
1063	NS-0045A	45	44-46	5%
1052	NS-0050A	50	49-51	5%
1077	NS-0055A	55	53-57	5%
1053	NS-0060A	60	58-62	4%
1067	NS-0064A	64	62-66	4%
1054	NS-0070A	70	68-72	4%
1068	NS-0074A	74	72-76	4%
1055	NS-0080A	80	78-82	4%
1069	NS-0084A	84	82-86	4%
1057	NS-0090A	90	88-92	4%
1070	NS-0094A	94	92-96	4%
1058	NS-0100A	100	98-102	4%
1071	NS-0104A	104	102-106	4%
1059	NS-0125A	125	120-130	4%
1060	NS-0150A	150	145-155	4%
1061	NS-0200A	200	190-210	4%

<sup>1</sup> Certified diameter for a given catalog number will be provided in the stated range.  
<sup>2</sup> Relative FWHM (full-width at half-maximum); FWHM divided by modal diameter.

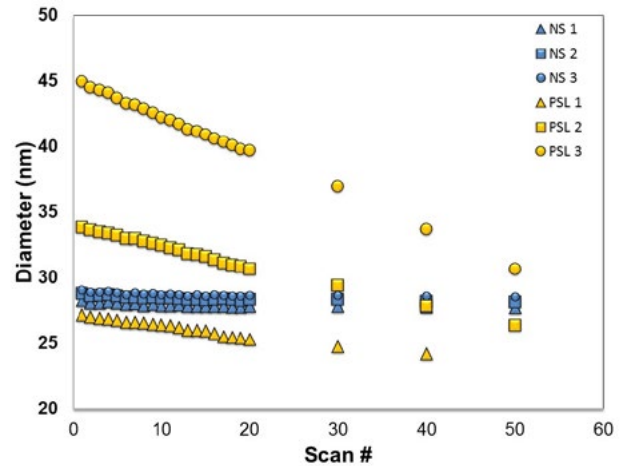
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TSI and the TSI logo are registered trademarks of TSI Incorporated.

### Specifications

Particle Composition	Amorphous SiO <sub>2</sub>
Particle Density	1.9 g/cm <sup>3</sup>
Index of Refraction	1.41 @ 633nm
Volume	5 mL
Concentration	10 <sup>13</sup> to 10 <sup>15</sup> particles per mL
Expiration Date	≥ 24 months
Additives	Ethanol (5-20% by mass) Organic stabilizer (<0.1% by mass)
Storage & Handling	Store at room temperature (See Certificate of Calibration and Traceability for more details.)



Comparison of size distributions of a commercially available PSL size standard (30 nm) and MSP's NanoSilica™ (30 nm). Suspensions of particles were aerosolized with aerosol electrospray (TSI® Model 3480). Size distributions were measured by particle mobility spectrometry. Particle suspensions were diluted in equal volume ratios.



Comparison of NanoSilica and PSL stability under DUV laser illumination: particle sizes measured with repeated SSIS scans of NanoSilica particles (30 nm nominal; blue symbols) and PSL spheres (30, 40, 50 nm nominal; yellow symbols) deposited on a silicon wafer.



MSP - Visit our website [www.tsi.com/msp](http://www.tsi.com/msp) for more information.

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