



**DFM**

Danish National Metrology Institute

### ABOUT DFM

DFM is Denmark's National Metrology Institute (NMI).

DFM is a signatory to the CIPM-MRA arrangement that ensures mutual recognition of measurements worldwide

### TRACEABILITY

All measurements are traceable to recognised national and international standard.

### ISO CERTIFICATION

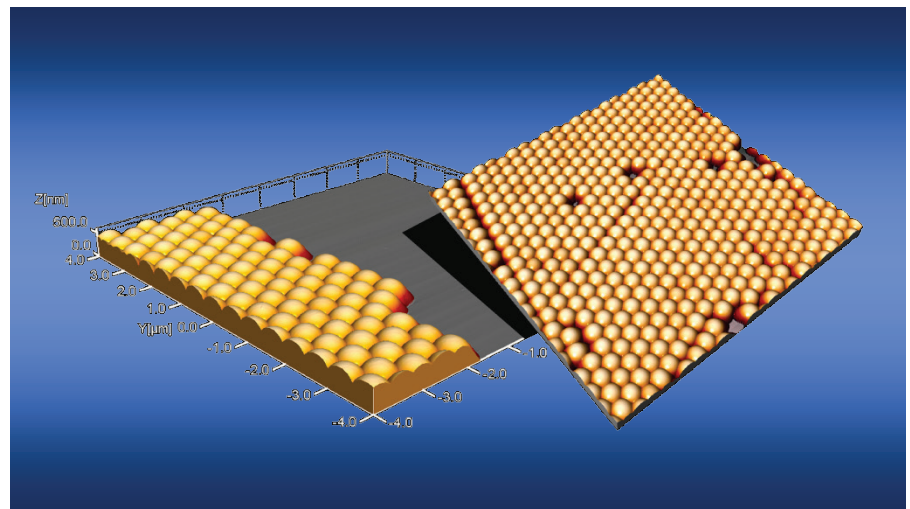
All services are covered by DFM's ISO 9001 certification

### CONTACT DFM

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# Size certified nanoparticles for reference purposes



## Advantages

When you choose DFM size certified nanoparticles, your Quality Assurance rests on well-documented and transparent measurement procedures, which are accredited according to internationally recognised ISO standards. This ensures a broad acceptance of the certificate and the traceability of the measurement in conformity with the highest metrologic requirements.

## Accreditation

Each bottle is issued with a calibration certificate which states the mean particle size of the population. The calibration results are traceable to recognized national and international standards. The calibration is performed under DANAK accreditation no. 255, following DS/EN ISO/IEC 17025. DANAK is the Danish Accreditation and Metrology Fund and one of the signatories to the EA Multilateral Agreement and the ILAC multilateral agreement for the mutual recognition of calibration certificates. The calibration certificate meets the highest international metrological standards. The uncertainty is estimated in accordance with ISO/IEC Guide 98-3:2008 (GUM:1995) and EA-4/02.



**CONSULTANCY SERVICES**

Do you need new measurement capabilities, does a method call for a bit of scrutiny, or are you perhaps seeking to acquire new equipment? Take advantage of the consultancy services we provide in addition to our calibration services.

As an independent institute deeply rooted within research and metrology, DFM has gained the reputation of being an agile, solid, and valuable partner. Contact us and find out why.

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# Services and specifications

DFM offers polystyrene latex (PSL) particle suspensions (our service K09.101) with mean diameters ranging from 100 nm to 5 000 nm. The particle populations can e.g. be used as calibration particles for optical particle counters according to ISO 21501-4. One bottle contains approx. 15 mL with typically 1-2 % (weight) suspended particles.

## Material properties and available sizes

Item	Description
Volume	15 ml
Form	Aq. suspension
Concentration	1-2 % typ. (weight)
Composition	Polystyrene
Density	1.05 g/cm <sup>3</sup>

Item	Description
Storage	Dark, 2 – 8 °C
Refractive index	1.59
Melting point	74 – 105 °C
Flash point	210 °C
Self ignition	444 °C

Name	Mean	Std. dev.	CV	Exp. uncertainty
DFM.NP01	105 nm	6 nm	5.7 %	5 nm
DFM.NP03	277 nm	6 nm	2.2 %	7 nm
DFM.NP05	500 nm	9 nm	1.8 %	9 nm
DFM.NP07	697 nm	13 nm	1.9 %	11 nm
DFM.NP10	1027 nm	19 nm	1.9 %	13 nm
DFM.NP20	1998 nm	42 nm	2.1 %	22 nm
DFM.NP30	3066 nm	45 nm	1.5 %	32 nm
DFM.NP50	5045 nm	78 nm	1.5 %	50 nm

*The stated values are indications. Each bottle is certified individually. Further sizes available on request.*

## Related services

In addition, DFM offers to measure PSL particle populations of customer's choice within the size limits stated above, and to calibrate particle counters for clean room monitoring.:

- K09.102 Customer's particles (100 nm - 5 µm diameter) measured by AFM
- K09.001 Calibration of particle counter (counting efficiency)
- K09.002 Additional ISO 21501-4 tests of particle counter \*)
- K09.006 Additional Size Setting and Size Resolution \*)

\*) *Outside DANAK accreditation*