



# Single Particle Optical Counter LUMiSpoc<sup>®</sup>



## Count 'n' Size @Nanoscale



Nano particle concentration



Multimodal and polydisperse particle size distributions



Easy calibration



Short measurement time



Agglomeration & flocculation kinetics



Particle contamination detection



Determination of distribution tails



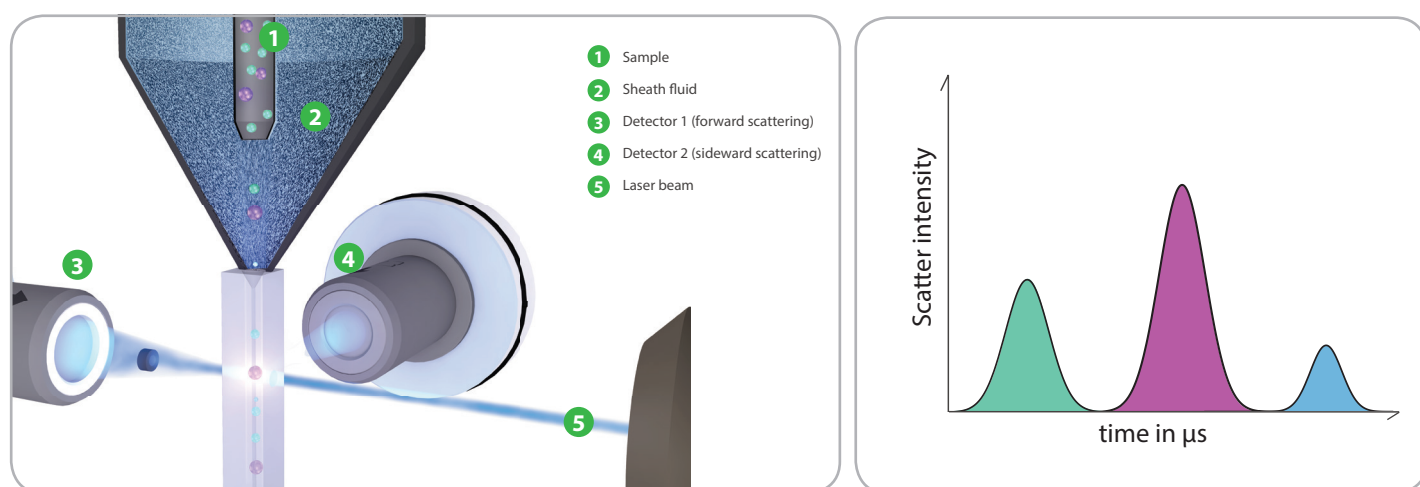
Filter media & membrane testing

# LUMiSpoc<sup>®</sup> using **SPLS-Technology<sup>®</sup>**

The LUMiSpoc<sup>®</sup> is a highly advanced single particle analysis system, similar to a flow cytometer, that measures particle size distribution and particle concentration of nano- and microparticles in suspensions and emulsions with an unparalleled resolution and dynamic range.

The instrument uses the patented **Single Particle Light-Scattering Technology**, a technology which records light that is scattered into forward and sideward directions by single nano- and micro particles while passing a laser beam of a special beam cross-section.

Single particles are lined up in a single line by hydro-dynamic focusing in an optical flow cell. This way, a sample



When a single particle crosses the laser beam, forward and sideward scattering are recorded simultaneously. Scattered light is detected by photomultipliers and converted into digital signals. The signals are counted for each intensity class.

Recording of particle scattering

flow in the middle and a surrounding sheath flow are created by means of pressure differences. The sheath flow creates a kind of fluid wall for the sample flow and prevents mechanical blockages.

The cross section of the sample flow can be adjusted dynamically (by factor 35) with no changes to the mechanical parts. This allows you to work in a wide sample concentration range.

When a single particle crosses the laser beam, the light is scattered in all directions. Forward and sideward scattering of light are recorded simultaneously by means of two photomultipliers, and are analyzed in real-time after amplification and digitalization.

The scattered light intensities determined for each particle are sorted in more than 1 million bins and displayed as high-resolution bar-chart stating the count distribution on an easy-to-use touch screen. Classified intensities are converted into particle size distribution density based on the Mie theory. Measurement, data storage and analysis are powered by software platform SEPView<sup>®</sup>.

SPLS-Technology<sup>®</sup> enables you to get a deep insight into complex nano- and submicro-particulate systems, which helps you to design tailored particles and dispersions.

# Applications

Particle counting and size determination

Number concentration determination

Direct determination of the number-based particle size distribution of nano- and microparticles

Classification of nanomaterials

Recording of agglomeration & flocculation kinetics

Determination of distribution tails

Particle contamination detection

Separation membrane & filter medium testing, cut-off determination

Dispersions of: CMP slurries, carbon black, pigments, filler, pharmaceutical emulsions & suspensions, reference & smart particles, biological cells, viruses,...

# Benefits

- Very high resolution of monomodal, multimodal & polydisperse size distributions
- extremely high classification
- high counting rate (high-frequency digitisation, pulse analysis & classification)
- Large dynamic range (particle sizes from 40 nm - 8 µm)  
without range switching or component changes
- Short measurement time
- Easy operation (measurement, rinsing)
- Small sample volume
- Touch display with embedded PC & server/browser based software
- One-point calibration by reference particles



# Specifications

## Measurement parameters

Particle size range	40 nm to 350 nm (sideward scattering) 200 nm - 8,000 nm (forward scattering)
Size resolution ( $x < 1 \mu\text{m}$ )	< 10 nm
Particle concentration range	$10^3 \text{ ml}^{-1}$ to $10^9 \text{ ml}^{-1}$
Counting rate	up to 10,000 particles per second
Typical measurement time	1 min
Particle counting precision	< 2 %
Sample volume	250 $\mu\text{l}$ (recommended)


## Technical specifications

Light source	Violet diode laser, adjustable
Dimensions (W x H x D)	60 x 52 x 59 $\text{cm}^3$
Weight	25 kg
Power supply	24 V DC, 220W



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 The NEXT STEP in Dispersion Analysis & Materials Testing

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