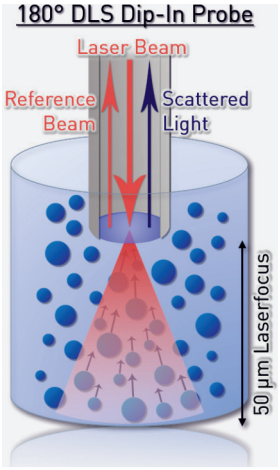
NANO-flex® II

Particle size determination from 0.3 to 10 µm with 180° DLS system

The NANO-flex® II 180° DLS system measures particle size distributions of suspensions and emulsions in the range of 0.3 nm to 10 µm and concentrations up to 40 % by volume. The principle of heterodyne 180° backscattering applied here is characterized by its high selectivity in the nm range and a very high resolution; it is also suitable for samples with a wide or multi-modal size distribution. Due to the low penetration depth of the laser light, samples of high concentration are measured without disturbing multiple scattering. Compared to cuvette based systems, many samples can be measured without dilution in original concentration. The dip-in probe used in the NANO-flex® II has a diameter of 5.5 mm and allows a wide range of applications. In conjunction with the IPAS extension, particle size distributions can be measured inline. In combination with the Stabino® II, stability ranges and critical coagulation points can be determined.

Method



The laser is focused into the sample by an dip-in probe with sapphire glass disk. Part of the laser light is reflected by the sapphire glass. This reference laser light and the light backscattered by the particles interfere with the detector. The information about the particle size distribution carries the light backscattered by the particles, the reference laser light acts as optical amplification and increases the signal to noise ratio. The amplified scattered light signal is converted into a "power spectrum" from which the particle size distribution is calculated.

Two decisive advantages result from the 180° DLS measuring principle:

- No multiple scattering due to the low penetration depth (approx. 50 µm) of the laser light into the sample.
- High sensitivity and resolution due to optical amplification of the measuring signal.

Applications

For the size determination with the NANO-flex® II there are hardly any restrictions, if the viscosity of the sample is in the Newtonian range. Depending on the refractive index, viscosity and particle shape, particle sizes from 0.3 nm to 10 µm and concentrations up to 40 % by volume can be measured. The flexible and robust measuring probe is multifunctional, easy to clean and allows measurements in almost all media. Together with the IPAS extension, in-line measurements can be realized.

Typical areas of application for the NANO-flex® II are:

- Printing industry (ink jet inks, flexo, screen printing), pigments
- Ceramics
- Pharmacy
- Food industry (brewing, beverage technology)
- Coatings
- Materials research (e.g. nanocellulose)

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IPAS

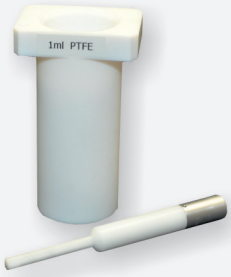
Inline Particle Analysis System - Inline measurements in real time

In many production processes of dispersions, such as printing inks or inkjet inks, there is an increasing need to measure particle size in real time during production. This allows very good control over top-down and bottom-up processes as well as energy- and time-efficient product manufacturing. On the other hand, mixing during the manufacturing process prevents direct measurement in the medium. The IPAS solves this problem by means of an encapsulated measuring chamber which can be filled and rinsed automatically with the sample from the process by means of an impeller. The measuring probe of the IPAS is integrated into the measuring head of the NANO-flex® II. The coupling with process control units enables fully automatic control and monitoring of the process sequence.

NANO-flex® II with IPAS extension
for inline measurements

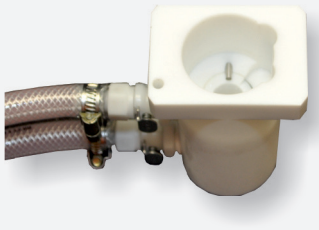
Accessories

Measuring cell 10 mL



Measuring cell 1 & 3 mL including piston

Measuring cell 10 mL -black-



Tempered measuring cell from 0°C to 90°C

Piston set

- 100 µm
- 200 µm
- 400 µm
- 1000 µm
- 2000 µm conical

pH electrode

- Glass
- Gel

Technical Data

	NANO-flex®
	Particle size
Measurement principle	180° heterodyne back- scattering setup - Laser-amplified scattering reference method (FFT-PS)
Size range	0.3 nm - 10 µm
Measurement period	from 10 sec.
Inline capability	✓ with IPAS extension
Potential	—
Mobility	—
Reproducibility: - Size - Zeta potential	1% with standard dispersion —
Titration	—
pH-range	1 to 14
Temperature range	0°C - 90°C
Conductivity	independent
Sample concentration	up to 40 vol.%*
Sample volume	from 10 µL
Sample type	organic /aquaeous
Molecular weight determination	✓
Titration: End points	—
Dimensions (WxHxD)	180x300x260
Weight	6 kg
Power supply	90 - 240 V

* dependent on sample

CE approved.

Manufactured by Colloid Metrix, distributed in the UK and Ireland by **analytik**.