CLASSIZER™ ONE Multiparametric single particle analyser

Cutting-edge platform for R&D and QC of particles in biological, industrial, and environmental heterogeneous liquids powered by patented single particle extinction & scattering SPES technology.



A SPES ahead in particle analysis



- Formulation QbD & SbD
- Heterogeneous samples
- Complex-but-real particles



- In target complex fluids
- Formulation stability
- Shelf life optimization



- Continuos flow analysis
- Process QC/PCA
- Impurities identification

CLASSIZER[™] ONE is the cutting-edge particle analysis platform based on patented Single Particle Extinction and Scattering (SPES) method for the analysis, classification, and counting of submicron and micrometric particulate systems for research, tailored formulation, and quality control of delivery systems, cosmetics, pigments, inks, abrasives, foods, agrochemicals, and in life and environmental sciences.

How SPES works.

Particles are dispersed in a filtered solvent or in a diluted heterogeneous liquid which is flowed through a scattering cell where a laser beam is properly shaped and focused. As a single particle crosses the laser beam, the interference pattern between the transmitted beam and the forward scattered light is recorded on a segmented photodiode. The interference pattern presents dark and bright fringes delivering the unique optical properties of the single particle illuminated. A dedicate Pulse Shape Analysis validates each scattering signal and retrieves two independent optical parameters, namely real *Re* and imaginary *Im* components of the forward scattered field S(0), plus counts particles triggered.

In few minutes SPES creates the unique EOS Clouds: a 2D histogram which is the optical fingerprint of the sample. A heterogeneous sample produces simultaneously more clouds for each particle population, which can be easily individually selected, analyzed, and compared.





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Thanks to the unique EOS CLOUDS and SPES data, the user can easily select any single particle population detected and represented. Particle size distribution, numerical concentration and other statistical insights are retrieved accordingly to the selection, to whole sample or for each time frame of the acquisition in continuous flow analysis mode.

- Optical classification, absolute particle size distribution, and numerical concentration of each single particle populations irrespectively of polydispersity & composition.
- Quality control of optical particle structures as porosity, wetting, aspect ratio, payload, impurities,, and shelf-life without intermediate steps (e.g., purification/filtration).
- Measurement of the particle behavior and the particle formulation stability directly in real heterogeneous non-filtered target biological, industrial, or environmental fluids.
- Hi-resolution continuous flow analysis of particles, also coupling spes information with other analytical devices as uv-vis, cfff, small chemical reactors, and pilot line.
- Statistical approaches as oversize measure and PCA for Hi-Quality Batch-2-Batch analysis and outof-specifics identifications in product formulation and production.



Specification	
SPES measuring range ¹	Dielectric spheres: 200 nm – 20 µm Metallic spheres: 100 nm – 10 µm
Particle concentration ¹	10 ⁵ – 10 ⁷ particles/ml (10 ⁶ particles/ml ideal)
Type of analysis	SPES (patented) Laser light scattering analysis of wet samples in laminar flow
Laser unit ¹	Red light diode (λ=640 nm, <150 mW) [customizable]
System aligment ¹	Semiautomatic (fabs preset, tuned on installation/maintenance, automatic alignment of the sensors)
Measuring time ¹	10-15 min, Acquisition rate up to 10,000 events/min
Sample flow ¹	Stable, laminar flow, typ. 0.5, 1, 2, 4 ccm [customizable]
Net weight and dimension (WxDxH)	25 kg; 50 cm x 50 cm x 25 cm (depending on configuration)
Wetted surfaces	Teflon, Quartz, PEEK [customizable]
Environment	Temperature: 18–27 °C; RH: 35% – 75% RH @25 °C
User software	GUI for system & accessories management, standard data analysis. Custom add-ons for tailored SOPs, advanced features as continuous flow analysis, advanced data analysis (eg. aggregation, principal component analysis)
PC System Requirements	Intel® Core™ i5 – min 4 cores @2 GHz or similar, 40 GB SSD, 8 GB RAM, Windows 10, x2 USB 3.0, 1080p monitor
Accessories	Industrial-grade PLC & HMI embedded in the standard CLASSIZER™ ONE version
¹ Dependent on sample, on sample preparation, and on model and configuration of CLASSIZER™ ONE in use.	





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