



The NEXT STEP™ in Dispersion Analysis  
& Materials Testing



Dispersion Analyser

# LUMiSizer®

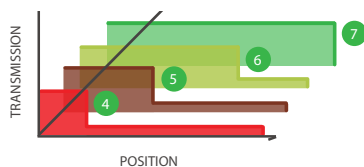
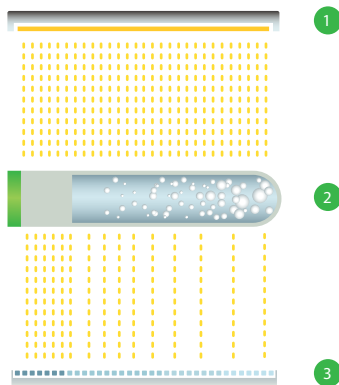
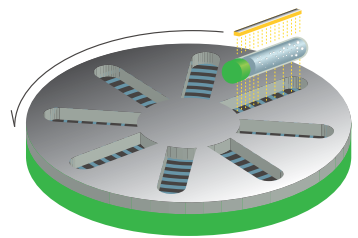
## The All-in-One Dispersion Analyser.

Stability | Demixing | Consolidation | Particle Sizing

# LUMiSizer® using



Allowing you to have a look  
at the whole sample



- 1 LIGHT SOURCE
- 2 SAMPLE [0.1-2.0ml]
- 3 SENSOR [2500 detectors]
- 4 5 6 7 KINETICS OF  
TRANSMISSION / EXTINCTION PROFILES

The High-End Dispersion Analyser LUMiSizer®, a microprocessor controlled analytical photocentrifuge, is your complete dispersion lab, all in one instrument. The quick characterization of any demixing phenomena, like sedimentation, flotation or consolidation and the calculation of the velocity distribution in the centrifugal field as well as of the particle size distribution makes the LUMiSizer® the instrument of choice for research, development and QA/QC.

The patented cutting-edge STEP-Technology® permits to obtain **S**pace- and **T**ime-resolved **E**xinction **P**rofiles over the entire range of up to 12 different samples in situ recorded simultaneously with high accuracy. Parallel near infrared or blue light <sup>1</sup> illuminates the entire sample cell <sup>2</sup> and the transmitted light is detected by more than 2000 detectors of the CCD-line <sup>3</sup>. Transmission is converted into extinction and particle concentration may be calculated <sup>4-7</sup>.

The multisample analyser is ideally suited for characterization and optimization of dispersion stability and shelf-life as well as particle-particle interactions, compressibility of particles and flakes, the structural stability and elastic behaviour of sediment and gels.

Demixing phenomena are quantified regarding clarification velocity and instability index, sedimentation and flotation velocity of particles, residual turbidity, separated phase volume (liquid or solid), sediment consolidation or dewaterability.

# SEPView®



your window to dispersion analysis

- ▶ Windows-based with Ribbon User Interface
- ▶ Plug & play, pack & go
- ▶ Simultaneous instability index analysis for 12 samples in real-time.
- ▶ Individual user customization.
- ▶ Full SOP concept (Creation, capture, data analysis)
- ▶ 8 different tools to understand (quantify) even the most complicated dispersion:

Time lapse measurement replay

Dispersion fingerprint

Instability index

Clarification

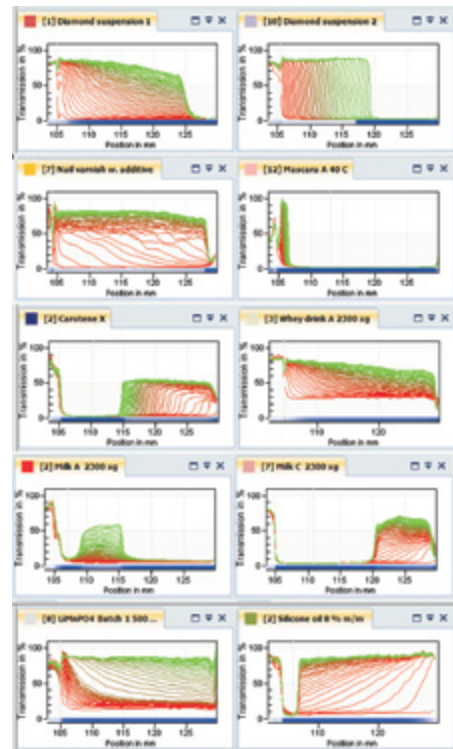
Phase separation

Sedimentation and creaming velocities

Particle density and size distribution

First derivative of integral transmission

- ▶ Windows Explorer based data management
- ▶ Comprehensive database security and full audit log
- ▶ Complies with 21 CFR Part 11.

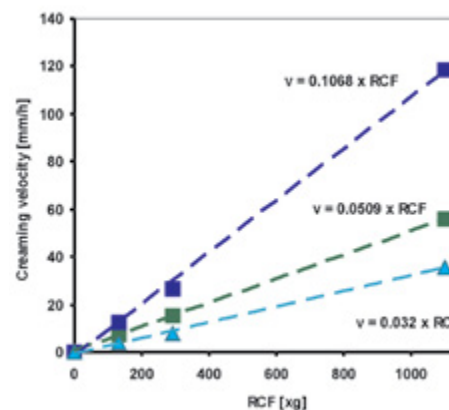


Online separation process of up to 12 samples at a glance.

## Stability

### Shelf Life and Consolidation

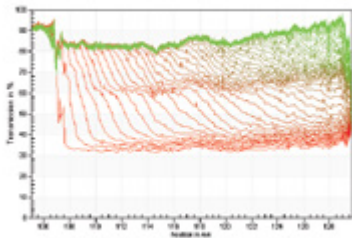
With the LUMiSizer, stability tests are up to 5000x faster than performed in a test tube under earth gravity by naked eye. Fast stability ranking and shelf-life determinations of dispersions in original concentration are done in minutes/hours instead of months/years. The obtained results correlate well with the sample behaviour at normal gravity. The consolidation behaviour of sediment and particle networks can easily be determined.



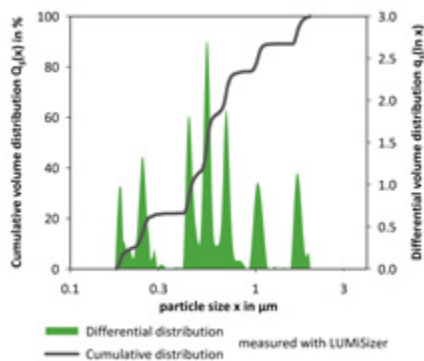
Shelf life of alcoholic milk beverages (cream liquors).

# Particle Sizing

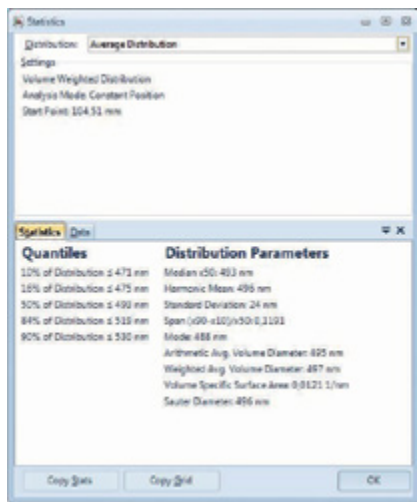
## and Particle Size Distributions



Transmission profiles of a bi-modal silica suspension.



Volume-weighted particle size distribution of a 7-modal silica suspension (150 - 1550 nm).



Comprehensive PSA Statistics.

Particle size distribution and velocity distribution are calculated on the basis of the two analysis modi "constant Position"- Concentration detection over time at one position- and the unique "constant Time"- Concentration detection over the entire sample length at least for one time.

Comprehensive information is provided with respect to the multimodality or polydispersity of dispersed particles. The software animation tool displays the recorded measurement data with programmable playback parameters for easy recognition & identification of complex separation phenomena.

The modular and object oriented design of the software provides easy extension and customizing opportunities on customer's request, i.e. for special R&D or QC tasks.

### Velocity Distribution $Q_v(v)$ , $q_v(v)$

- + Direct measurement no calibration / no material properties
- + Always available - fast information for quality control
- + Qualitative information about particle size and polydispersity

### Extinction Weighted Particle Size Distribution $Q_{Int}(x)$ , $q_{Int}(x)$

- + Quantitative information about particle size distribution

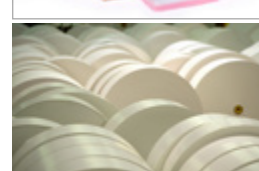
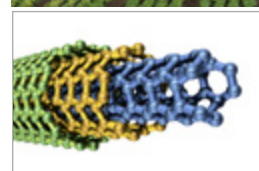
### Volume Weighted Particle Size Distribution $Q_3(x)$ , $q_3(x)$

- + Quantitative information about particle size and volume fraction of each class
- + Conversion into mass or number distribution



# Benefits

- ▶ Universal high-end analyser for science, R & D and QA/QC
- ▶ Direct, fast and objective characterization of any demixing phenomena
- ▶ Information within minutes and hours instead of months and years
- ▶ Reliable stability information up to 5000 times faster than by other methods
- ▶ Particle size information without material properties
- ▶ Particle susceptibility through superposition with magnetic fields
- ▶ For concentrated or diluted suspensions and emulsions
- ▶ For a large sample viscosity range
- ▶ Minimal sample volume required
- ▶ Various accessories and customizing options to fit your application
- ▶ Easy operation, comprehensive database solution



# Applications

Characterization of very slow separation processes (months till years), very stable, very high viscous dispersions with very high concentrations and very small particles and droplets.

Determination of separation stability, velocity and particle size distribution or consolidation in one measuring step.

Particle characterization, particle size distribution, particle-particle interactions, hydrodynamic density and magnetic susceptibility.

Measurement of carbon black, ink, food, fine chemicals, abrasives, polymers, color pastes, sludges, slurries, cosmetics, pharmaceutical dispersions, biocells, carbon nanotubes and much more materials.

Tasks requiring high sample throughput.

Determination of particle size distribution according to **ISO 13318-2**.

# Specifications

Accelerated phase separation	6–2300 times compared to gravity
Particle size distribution	20 nm to 100 µm
Consolidation measurements	concentrated dispersions and sediments
Observation time	1 s to 99 h
Conformity	ISO/TR 13097; ISO/TR 18811; ISO 13318-2; ISO 18747; CFR 21 Part 11

Samples	up to 12 simultaneously
Volume	0.05 ml to 2.0 ml
Concentration	0.00015 Vol% – 90 Vol%
Particle density	up to 22 g/cm <sup>3</sup>
Viscosity	0.8–10 <sup>8</sup> mPas
Particle size	10 nm to 1000 µm

Light source	multi-wavelength
Temperature control	4 °C to 60 °C, +/- 1K
Cells	different material and optical path
Dimensions (WxHxD)	37 x 27 x 60 cm
Weight	40 kg
Power supply	100 V, 120V, 230 V; 50/60Hz



## Version

LS 610  
LS 611  
LS 650\*  
LS 651\*

## Temperature control

4 °C - 40 °C  
4 °C - 60 °C  
4 °C - 40 °C  
4 °C - 60 °C

\* optional with temperature ramp

**LUM GmbH, Berlin, Germany**  
Phone: +49 30 6780 60 30  
E-Mail: [info@lum-gmbh.de](mailto:info@lum-gmbh.de)  
Web: [www.LUMiSizer.com](http://www.LUMiSizer.com)  
[www.LUM-GmbH.com](http://www.LUM-GmbH.com)  
[www.dispersion-letters.com](http://www.dispersion-letters.com)

RIFERIMENTO PER L'ITALIA

 Qi technologies

**Qi srl**  
t +39 06 9105461  
[www.qitech.it](http://www.qitech.it) | [SalesQi@qitech.it](mailto:SalesQi@qitech.it)

