



The NEXT STEP[®] in Dispersion Analysis

Dispersion Analyser LUMiSizer[®]

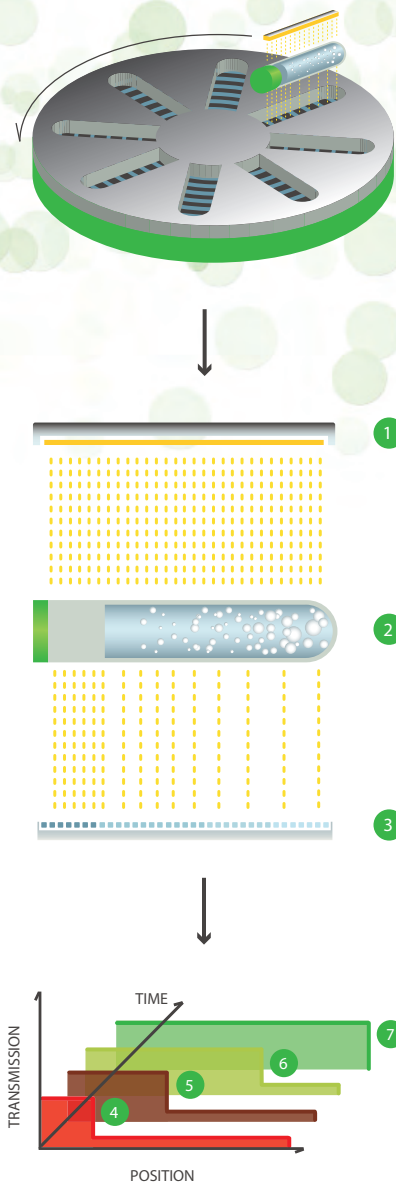
**The All-in-One
Dispersion Analyser**

Stability
Demixing
Consolidation
Particle Sizing



LUMiSizer® using STEP-Technology®

Allowing you to have a look at the whole sample



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 Space- and Time-resolved Extinction Profiles over the entire range of up to 12 different samples in situ recorded simultaneously with high accuracy. Parallel near infrared or blue light ¹ illuminates the entire sample cell ² and the transmitted light is detected by more than 2000 detectors of the CCD-line ³. Transmission is converted into extinction and particle concentration may be calculated ⁴⁻⁷.

The multisample analytical photocentrifuge

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.

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

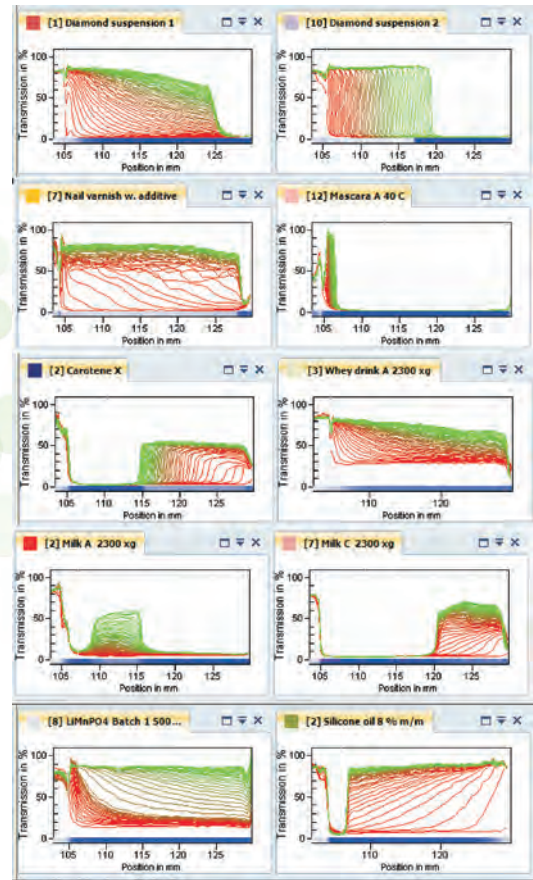
Principle of the STEP-Technology®.



SEPView®

your window to dispersion analysis

- ▶ Windows 7 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)
- ▶ Seven 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 size distribution
- ▶ Windows Explorer based data management
- ▶ Comprehensive database security and full audit log
- ▶ PC and server based editions.
- ▶ 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 behavior of sediment and particle networks can easily be determined.



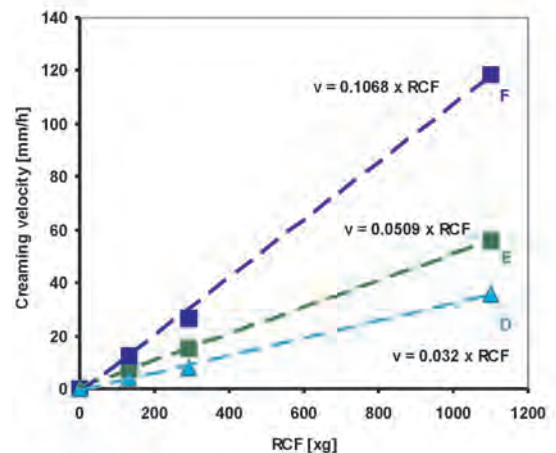
3.5 HOURS

in the LUMiSizer equal

365 DAYS in real time

1 MONTH

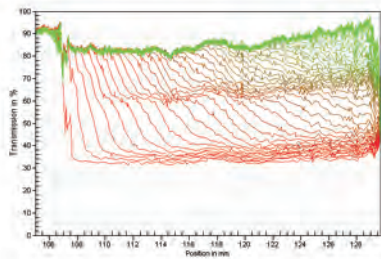
1 YEAR



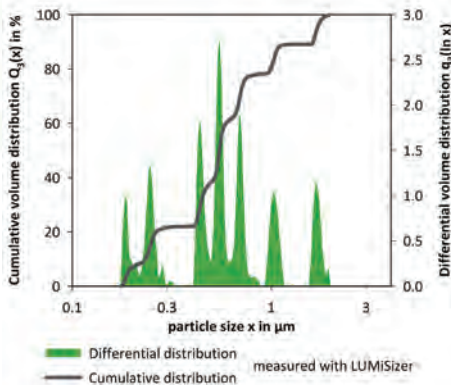
Shelf life of alcoholic milk beverages (cream liquors).

Particle Sizing

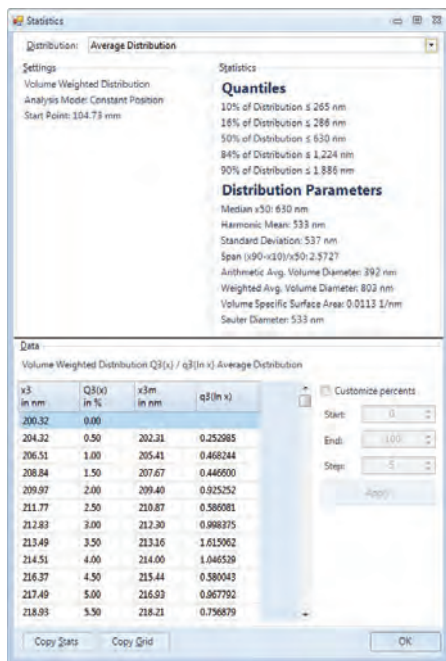
and Particle Size Distributions



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 modes "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 $Qv(v)$, $qv(v)$

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

Intensity Weighted Particle Size Distribution $QInt(x)$, $qInt(x)$

- + Quantitative information about particle size distribution

Volume Weighted Particle Size Distribution $Q3(x)$, $q3(x)$

- + 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

1. Characterization of:

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

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

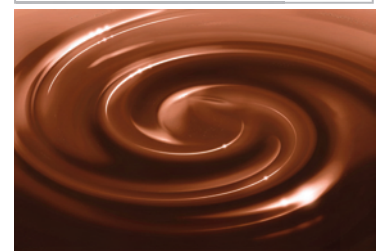
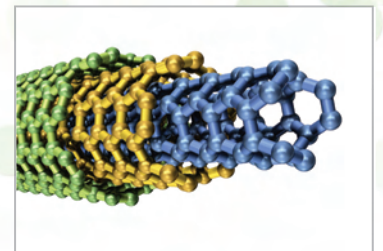
3. Particle characterization:

- + particle size distribution
- + particle-particle interactions
- + hydrodynamic density
- + magnetic susceptibility

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

5. Tasks requiring high sample throughput.

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



Specifications

Accelerated phase separation	5 - 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 13318-2; CFR 21 Part 11
Samples	up to 12 simultaneously
Volume	0.05 ml to 2.0 ml
Concentration	0.01 Vol% - 90 Vol%
Density	up to 22 g/cm ³
Viscosity	0.8 – 10 ⁸ 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 sup-	100 V/ 120V / 230 V, 50/60Hz

ply



Version
LS 610

Temperature control
4 °C - 40 °C

Version
LS 611

Temperature control
4 °C - 60 °C

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