Benefits:

- Efficient high-end analyser for quality control, research & development
- Direct, fast and objective characterization of any demixing phenomena
- Precise information within minutes and hours instead of weeks and months
- Reliable stability information up to 2300 times faster than by other methods
- For concentrated and diluted suspensions and emulsions
- For a large sample viscosity range
- Minimal sample volume required
- Various versions, accessories and customizing options to fit your application
- Upgrade options to Dispersion Analyser LUMiSizer®
- Easy operation, comprehensive information

Applications:

1. Characterization of:

- slow separation processes (hours till months)
- stable, high viscous dispersions up to very high concentrations
- small particles and droplets

2. Measurement of CMP slurries, inks, pigments, fine chemicals, food, polymers, creams, pastes, sludges, cosmetic emulsions, pharmaceutical dispersions, biocells, petrol, crude oil, bitumen, cellulose, carbon black, paints, drinks and much more materials.

3. Tasks requiring high sample throughput.

4. Fast fingerprinting of emulsions and suspensions.

Specifications:

- 8 different samples measured at once under identical conditions
- RCF: 6 - 2300 xg (Advanced), 11 - 1140 xg (Classic)
- Advanced optics, variable light intensity
- Temperature control from 4 °C - 60 °C, ± 1 K
- Measuring time 8 min - 42 h, depending on task and objective
- Customizing of measuring time possible
- Sample volume 0.1 ml - 2.0 ml (depending on cell type)
- Sample concentration 0.1 Vol% - 90 Vol%
- Sample viscosity: 0.8 mPas - 10^8 mPas
- Particle size: 50 nm - 1000 µm
- Different cell types available for efficient measuring conditions
- PC controlled operation (Win2000 / XP)
- Upgrade options for temperature range and to Dispersion Analyser LUMiSizer®
- Instrument and SEPView-Software comply with CFR 21 Part 11.

Versions	Temperature control	Compressed air connection	Upgrade option to LUMiSizer®
LF 110 (Advanced)	4 °C - 45 °C	Yes	Yes
LF 111 (Advanced)	4 °C - 60 °C	Yes	Yes
LF 112 (Advanced)	15 °C - 45 °C	No	Yes
LF 113 (Classic)	35 °C - 60 °C	No	No
LF 114 (Classic)	ambient T	No	No

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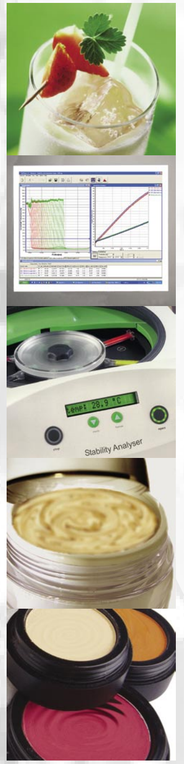
LUM - The Next STEP® in Dispersion Analysis

Stability Analyser LUMiFuge®



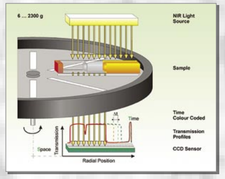
Direct, Objective and Rapid Stability Testing

Stability
Fingerprinting
Shelf Life

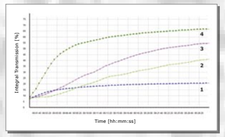
LUMiFuge®

using STEP®-Technology

Advanced Stability Analyser LUMiFuge®



Principle of the STEP®-Technology



Sedimentation kinetics of Multi-walled Carbon Nanotubes in phenyl-ethanol (1) and ionic liquids (2-4)

The High-End Stability Analyser LUMiFuge®, provides you with the objective classification and quantification of demixing phenomena and with the easy and fast determination of stability and shelf-life of dispersions. It is the instrument of choice for process optimization, quality assurance / quality control as well as for process control related research and development.

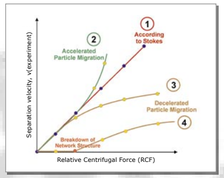
Classic versions of LUMiFuge® monitor daily quality parameters of products and processes, while the advanced LUMiFuge provides extended options for additional process development and even faster shelf life prediction.

The patented cutting-edge STEP®-Technology permits to obtain **S**pace- and **T**ime-resolved **E**xtinction **P**rofiles over the entire range of up to 12 different samples simultaneously. Parallel near infrared (NIR) light (I_0) illuminates the entire sample cell and the transmitted light (I) is detected by over 2000 detectors, with a micrometer scale, of the CCD-line sensor. Transmission is converted into extinction by lg I/I_0 and particle concentration may be calculated.

SEPView® is a comprehensive database driven software solution. It controls the instrument and provides functions for data management, visualisation, analysis and result documentation. Customizing options are available on request. Transmission profiles are recorded at different time intervals, displayed as a sequence on the screen and automatically stored in a special designed database, together with all instrument settings and actual calibration data.

Stability

and Shelf Life

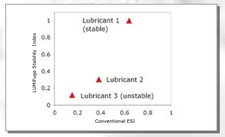


Shelf life and structural stability

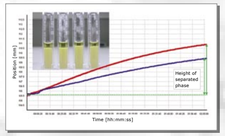
Stability tests are up to 2300x faster than performed in a test tube under earth gravity. Fast stability ranking and shelf-life determinations of dispersions in original concentration are done in minutes/hours instead of months/years. In addition, demixing velocity in dependence on RCF reveals information about the rheological behaviour of complex samples. In case 1-3 shelf life at gravity may be simply calculated based on the obtained v-vs.-RCF-functions. Even for material with no separation at gravity (4) structural parameters similar to the yield point are provided.

Quality Control

and Process Optimization



Comparison of lubricant stability within minutes



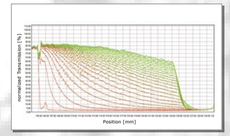
Quality control of margarine samples, 2 hrs at 2300 xg, 20°C

Lubricant (o/w emulsion) stability is determined within minutes instead of several hours required for **E**mulsion **S**tability **I**ndex ESI, which is based on oil concentration measurement in the bottom and top phase after several hours storage in a measuring glass. The order of stability is the same, but LUMiFuge requires tiny sample amount and allows multisample measurement under identical conditions. Influences of the variation of process parameters, e.g. homogenizer time, are rapidly detected, too.

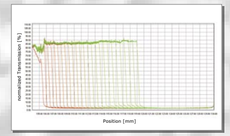
For quality control of margarine (w/o emulsions) the separation extent and kinetics can be easily compared and quantified. Using the ‚front tracking' analysis the kinetics of the water droplet sedimentation front is traced. Accelerated results at 2300 xg are verified at lower RCF.

Fingerprinting

and Classification



Polydisperse sedimentation of an aqueous diamond suspension



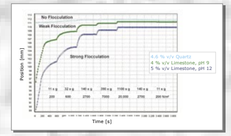
Zone sedimentation of an oily diamond suspension

Demixing phenomena are quantified regarding clarification velocity, sedimentation and flotation velocity of particles, residual turbidity, separated phase volume (liquid or solid), sediment consolidation or dewaterability. First information is obtained with respect to the multimodality or polydispersity of dispersed particles.

Already after the first recorded transmission profiles, the fingerprinting option allows to classify different sedimentation types, e.g. Polydisperse or Zone sedimentation as well as the creaming of Emulsions (e.g. to select the right emulsifier).

Particle - Particle

Interactions



Excess pressure ramping to characterize different flocculation degrees

The multisample analytical photocentrifuge is ideally suited for characterization and optimization of dispersion properties. It quantifies particle-particle-interactions, the compressibility of particles, flocs, the degradation of gels and the elastic behaviour of sediments.

The variation of centrifugal speed, i.e. centri-fugal pressure, within one measurement is employed to distinguish between non-flocculated materials (repulsive forces) and flocculated particles (attractive forces).