TOPAS®

Technologie-orientierte Partikel-, Analysen- und Sensortechnik

Particle Analysis System for Fluids

FAS 362

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Particle sizing methods based on single particle counting classify a physically measurable quantity according to particle size independently and under no assumptions. Such methods provide high sensibility and accuracy combined with very quick response of particle system analysis. A further advantage is that the correlation between optical effects and particle size can transparently be described.

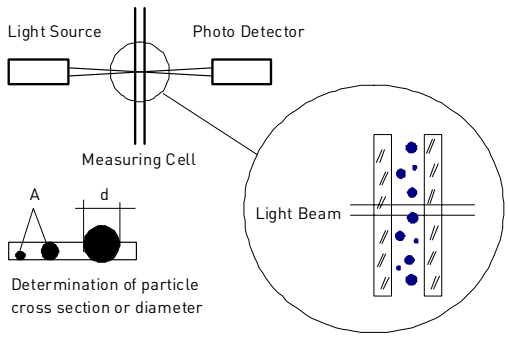
Based on such optical, single particle counting methods the series FAS was developed for particle sizing as well as concentration measurements with high resolution and resolution in a wide concentration range.

Special Advantages

- Non touching, optical measuring method with quick response
- Wide concentration and particle size range
- Extremely low dependency on particle material by the use of especially developed patented optics
- Optimally designed sensing volume
- No assumption of distribution function
- User friendly Windows® software
- Easy to use
- Robust, small dimensions and low weight

Applications

- Measurement of particle size distributions as well as particle concentrations
- Purity analysis of drinking water and cleaning baths
- Determination of separation efficiencies of filters
- Flocculation studies
- Analysis of biological or bacterial systems



Scheme of the Optical Unit

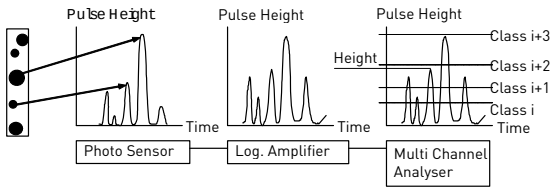
Principle

The measuring instrument of the series FAS can be divided into two main components: the sensor and the signal processing unit.

The sensor is mounted separately and contains the optical measuring setup (light source, measuring cell, photo detector and amplifier) and a sample unit with glass vessel, stirrer and a magnetic valve for sample flow control.

For the series FAS, the physical effect is used where an illuminated particle will cause a definite light extinction (blockage) corresponding to its cross section and size, respectively. For this, the particle system is continuously streaming through a sensing zone inside a measuring cell.

Particle concentration and measuring volume must be in such a relation that with high probability, the sensing zone contains only one particle at any time. Electrical pulses of the photo detector caused by single particles are amplified and classified by their height into different channels.



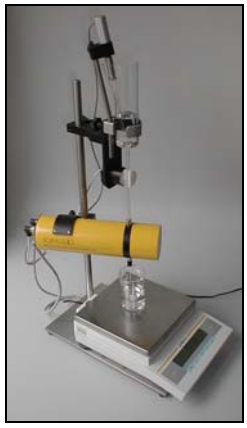
Signal Processing

The signal processing unit performs data sampling as well as reduction and the data transfer to the host computer connected by a serial RS232 interface.

Based on the calibration function, the representation of the particle size distribution with different weights (number, surface area, volume, mass) and their integral parameter describing is possible.

Options

For high accuracy measurement of particle concentration it is necessary to know the analysed volume very exactly.
For this purpose a new feature has been added to the PASWin software package where the user can connect a micro balance to an additional serial interface at the host computer. The micro balance will be read out during the measurement in order to obtain the precise mass flow through the sensor.



FAS 362 with micro balance

FAS 362 with pump

The Particle Analysis System for Fluids FAS 362 can also be used for measurements requiring continuous sampling. An optional pump is switched on automatically by the Topas Particle Analyzer Software PASWin.

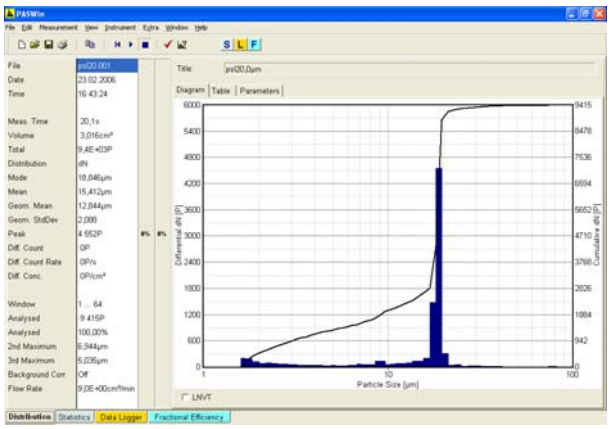
Sampling unit

The sampling unit is characterized by its simple design and can be handled and cleaned easily. The area of the surface that is covered by the sample liquid is small compared to the sample volume which minimizes its effect as a source of errors.
The adjustable and connectable stirrer ensures that the sample liquid is homogeneous.

Topas Particle Analyzer Software PASWin

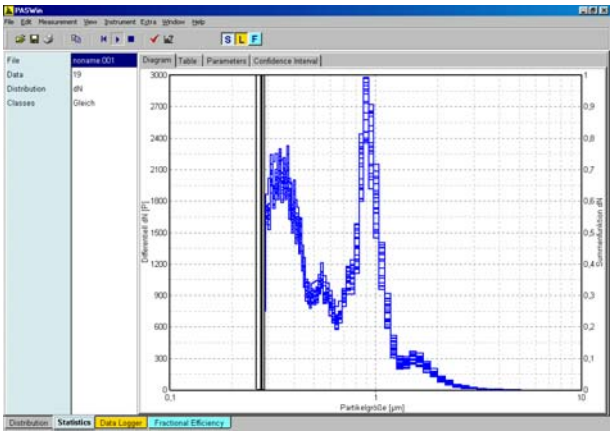
- Runs under Windows®
- Calculation of different type particle size distributions weighted by number, surface or volume
- Display and printouts as graphics or table
- User defined integration limit, channel resolution, logarithmic and linear size axis
- Background measurement and real-time subtraction
- Multitasking
- Data exchange with other Windows® applications (clipboard, DDE)
- Communication with micro balance via RS232 interface (optional) for precise flow rate measurement
- Data logger for long term investigations saves single measurement particle size distributions and can be used for monitoring and for trend investigation. (Concentration, x_{50}, Sauter diameter ...)

The particle analyzer software PASWin can be used to calculate particle size distribution and characteristic data of liquid dispersed particles.

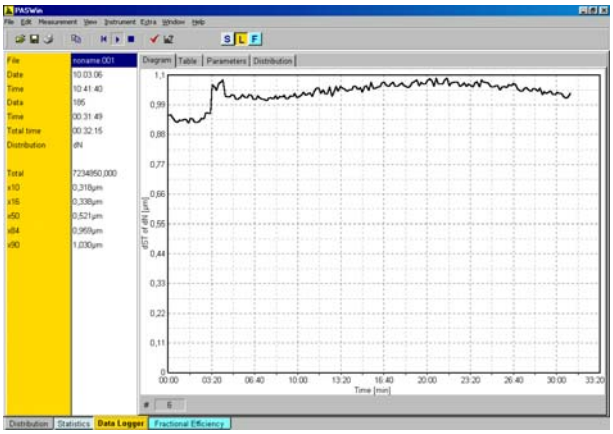


Main Window of the Particle Analyzer Software PASWin showing a high-resolution size distribution diagram of monodisperse particle material

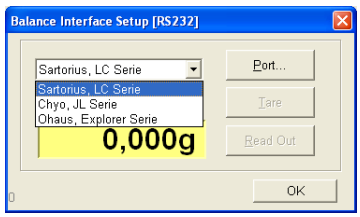
Based on calculation methods and calibration functions from channel content histograms of particle counters, particle size distributions can be calculated. Data are presented as graphics, tables or on screen or printer and stored as ASCII files.



Statistical diagram of several particle size distributions



Data logger diagram showing a monitoring result of particle size distribution



Dialog box for communication with optional micro balance

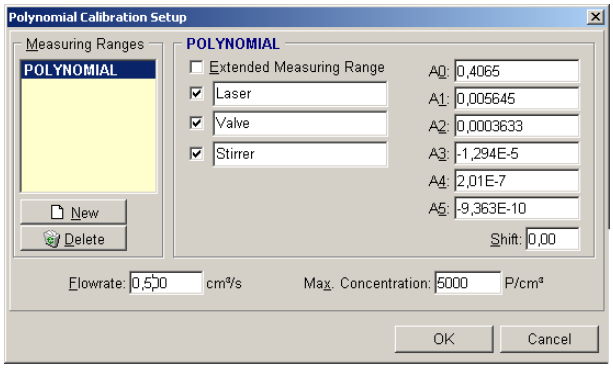
Specifications

Calibration by the user

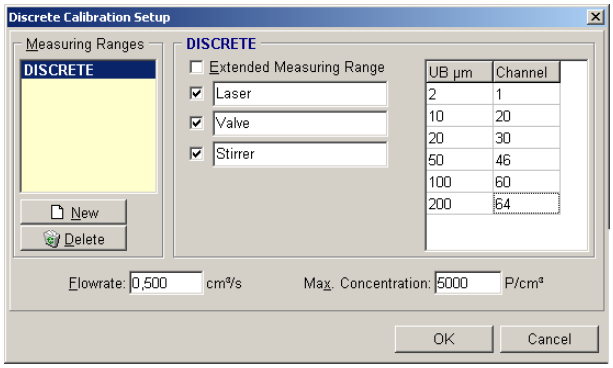
A transfer model serves the purpose of assigning particle characteristics (e.g. equivalent particle diameter) to a measurable quantity (e.g. pulse height). Such a model method can be a mathematical model or it can be based on the direct assignment of a measurable quantity to a characteristic of a particle. The direct assignment is called calibration.

By means of high-resolution calibration (as high as possible) the error between measured and calculated values is minimized.

Furthermore, repeating the measurement of a selected reference material system is applied as a method for quality assurance.



Dialog box for editing polynomial calibration files



Dialog box for editing discrete calibration files

Technical Data

Measuring range [1]	1 ... 100 µm	2...200 µm
Cross-sectional dimensions of the measuring cell	0.3 x 0.6 mm	0.5x0.75 mm
Measuring flow rate [2]	10 ml/min	30 ml/min
Particle concentration	max. 20000 particles/cm³	max. 5000 particles/cm³
Size channels	64	
Light source	laser diode, 5 mW, 670 nm	
Power supply	100 ... 260 VAC	
Dimensions of signal processing unit	290 x 230 x 120 mm	
Required space for sample feeding unit	320 x 300 x 650 mm	
Weight of signal processing unit	2.1 kg	
Weight of sensor, sample feeding unit, tripod	6.2 kg	

1) Customized measuring ranges possible

2) May differ for the device specifications
Real-time data acquisition by 16bit processor

- Calibrated with PSL standards

QMS certified to DIN EN ISO 9001

12 100 11908 TMS

For more information please visit our website at www.topas-gmbh.de

Specifications are subject to change without notice.

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