Application Note

MICROTRAC PARTICLE CHARACTERIZATION

part of VERDER scientific

CAMSIZER X2 Fraction Cell

Dynamic Image Analysis of Small Sample Quantities

Introduction

The new fraction cell for the CAMSIZER X2 is a perfect addition to perform wet measurements of small sample volumes. It is also ideal for analysis in expensive or harmful dispersing media, as the liquid consumption is extremely low at 10-15 ml per measurement. The fraction cell accessory consists of a flat, rectangular glass cuvette, as well as a holder that is inserted into the CAMSIZER X2 basic unit. The homogenization of the sample is carried out by means of a magnetic stirrer.
The fraction cell is easily accessible, robust, and easy to clean. Cross-contamination between samples is thus excluded.

Fig. 1: Left: Fraction cell with holder.
Right: 10 ml small volume cuvette with beveled side and 15 ml standard cuvette.

Installation and application

The fraction cell is easy to use and can be quickly installed in the device. First, remove the currently installed dispersion module (X-Dry or X-Flow) by disconnecting the hose and cable connections and pulling the module out of the CAMSIZER X2. Now place the fraction cell holder in the measuring shaft, i.e. the recess in the middle of the device, directly above the plug-in contact strip. Orient the holder so that the cable connection of the holder points to the front of the device. Fix the holder with the two thumbscrews in the threaded holes, which are also used for the calibration reticle. Connect the plug of the holder to the connector of the CAMSIZER X2. Insert the glass cuvette into the holder. The small-volume measuring cell must be oriented in such a way that the beveled side is not above the magnetic stirrer. Fill the cell with the desired dispersing medium and place the stirrer bar over the rotating agitator in the measuring cell so that it is held in place by the magnetic field. You can use the rotary knob on the fraction cell holder to adjust the stirring speed. The CAMSIZER X2 must be switched on for this.
You can now add the sample with a pipette and take a measurement.

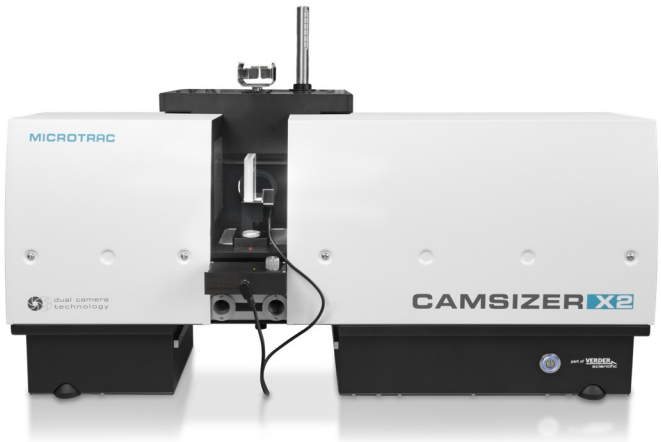

Fig. 2: CAMSIZER X2 with built-in fraction cell.
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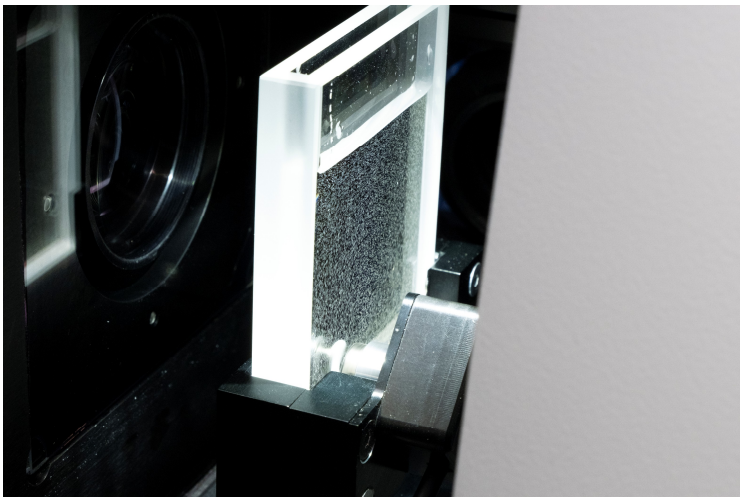

Fig. 3: Fraction cell with sample during a measurement. The magnetic stirrer bar is visible at the bottom left of the glass cuvette.

Measurement examples

A glass powder sample was dispersed in water and analyzed in the fraction cell of the CAMSIZER X2. Three consecutive measurements show excellent repeatability. The table shows the percentiles d10, d50, d90.

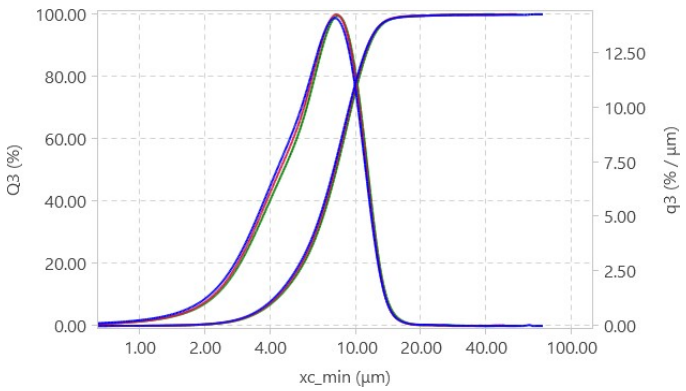

Fig. 4: Three repeat measurements of a glass powder sample. Cumulative distribution Q_3 and distribution density q_3.

	Measurement 1	Measurement 2	Measurement 3
X(Q3=10%)	4.53 µm	4.36 µm	4.44 µm
X(Q3=50%)	8.18 µm	7.93 µm	8.05 µm
X(Q3=90%)	11.65 µm	11.43 µm	11.49 µm

Another glass powder sample was analyzed with the floor cell and dry with the X-Jet module for comparison.

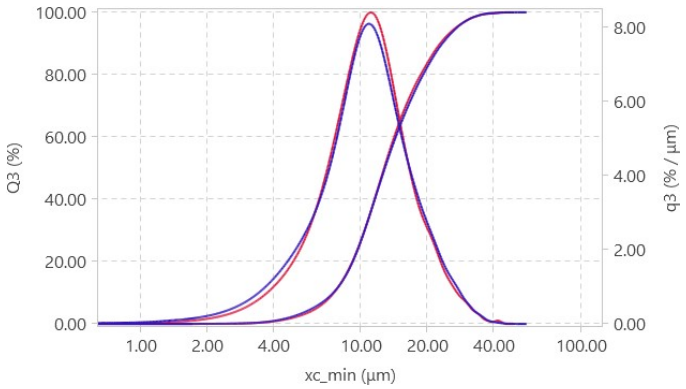

Fig. 5: Comparison of a wet measurement in the fraction cell (blue) with the dry measurement (red). Repeat measurements of a glass powder sample. Cumulative distribution Q_3 and density distribution q_3.

	Wet	Dry
X(Q3=10%)	7.45 µm	7.60 µm
X(Q3=50%)	12.95 µm	12.85 µm
X(Q3=90%)	23.65 µm	23.10 µm

In the second example, two "oil in water" emulsions were analyzed with the fraction cell. The average droplet size is 10 µm, but coagulated droplets can also be detected in the distribution and on the images.

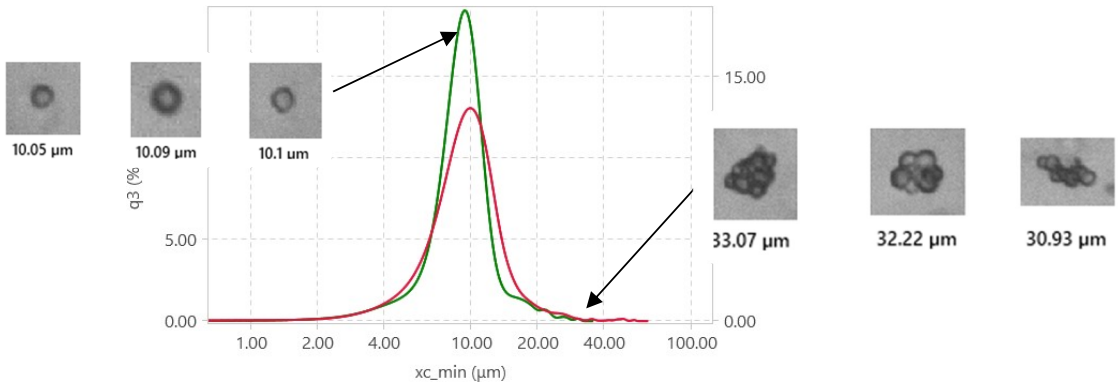

Fig. 6: Analysis of two emulsions in the fraction cell of the CAMSIZER X2. Density distribution q_3.

Specifications

Volume of the measuring cell	10ml (with beveled side) 15 ml (Standard)
Measuring cell dimensions (H x W x D)	80 mm x 70 mm x 40 mm, Gap width 4 mm
Power supply	Plug-in contact for CAMSIZER X2
Magnetic stirrer	Adjustment of the stirring speed via rotary knob
Measuring range (particle size)	Approx. 0.8 – 100 µm (depending on the density of the particles and the viscosity of the medium)

Contact

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