HORIBA Scientific

NEW!

Retsch® TECHNOLOGY

Solutions in Particle Sizing

Particle Analyzer CAMSIZER® X2

Particle Size and Particle Shape Analysis with Dynamic Image Analysis

Dry and wet measurement from 0.8 µm to 8 mm

dual camera technology

The second generation: new features, more performance

- Innovative optical concept
- Extremely high resolution (0.8 µm/pixel)
- 4.2 Megapixel per camera
- Higher frame rate: >300 images per second
- Extended dynamic measuring range 0.8 µm - 8 mm
- New dispersion nozzles optimized for particles up to 8 mm max.
- New X-Flow module for larger sample volumes

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The CAMSIZER X2 measures particle size and particle shape of a huge variety of sample materials such as:

- Abrasives (medium-size and small grit)
- Activated carbon
- Cement
- Chemicals
- Construction materials
- Food powder and granulate
- Glass beads
- Metal and ore powder
- Pharmaceutical powder, granulates and pellets
- Plastic fibers
- Plastic powder (PE, PP, PVC)
- Salt
- Sand
- Sugar
- Washing powder and raw materials
- Wood fibers

Particle Analyzer CAMSIZER® X2

Modular Design

CAMSIZER X2 is specially designed for the analysis of fine powders and granules which tend to agglomerate. Due to strong interacting forces, very fine particles tend to agglomerate which makes it difficult to detect the geometric dimensions of each individual particle. Therefore, the particles should be adequately dispersed when fed to the measurement zone. CAMSIZER X2 offers different sample feeding modules to ensure thorough particle dispersion.

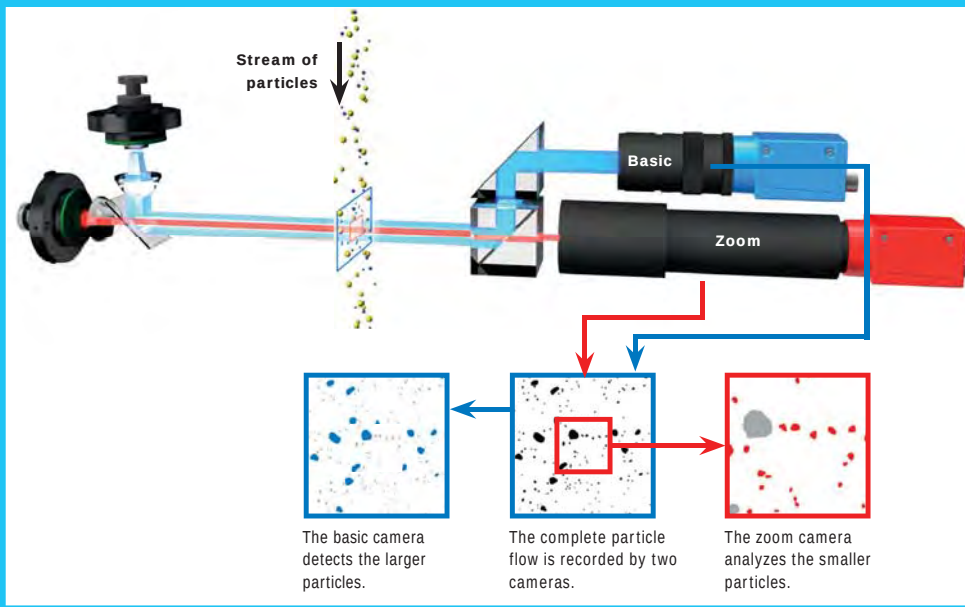
Dry samples are dispersed by gravity or air pressure where the powder is accelerated in a dispersion nozzle by compressed air and the resulting forces destroy the agglomerates. Pourable, non-agglomerating samples are simply measured in free fall without additional dispersion. CAMSIZER X2 also analyzes particles in liquids (suspensions, emulsions) where agglomerates can be dispersed by ultrasound, if required. The modular design of the analyzer allows for easy and convenient changing between the different dispersion options.

New Optical Design

Thanks to brighter light sources, faster cameras with higher resolution and, most of all, the new optical split view concept the CAMSIZER X2 has considerably improved the performance of its predecessor CAMSIZER XT. With more than 300 images per second and 4.2 mega-pixels per image the X2 model manages a 3.5 times higher data rate than the XT model; still, the software processes all data in real time. The new split view optical design is the current highlight of the patented dual camera system which is used in all CAMSIZER systems: One camera is optimized to analyze the small particles with high resolution in a small field of view, the other camera detects the big particles in a large field of view, providing excellent statistics.

The new patented split view optical design arranges the optical path and the direction of movement of the dispersed particles vertically to each other.

The monochromatic light beams of two pulsed LED light sources are focused and collimated to illuminate the detection area of each camera respectively (Basic and Zoom). This new optical design provides optimized illumination area, field of view, pulse length and pulse frequency for each camera. After the light beams have passed through the analysis zone, they are separated by a dichroic prism to be individually magnified and detected by one camera per beam.

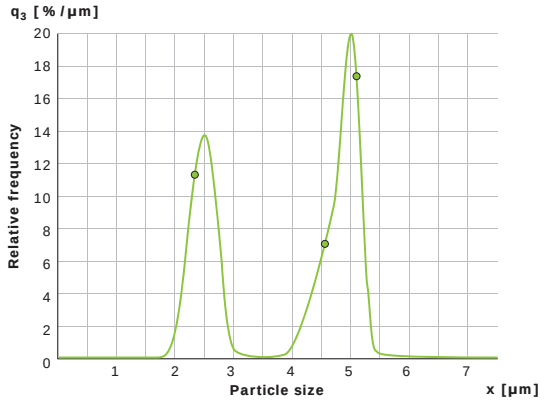


Application Examples

High resolution provides narrow size distributions

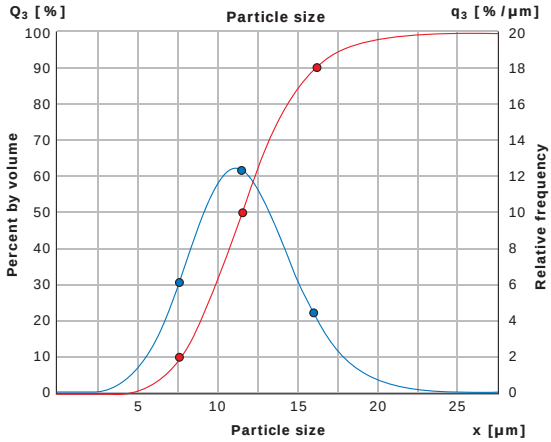
The new optical design improves the analysis of samples with narrow size distributions. Thanks to the higher resolution, the distribution width is measured more precisely. Even in the low micron range it is possible to separate e. g. bimodal mixtures of particles within a very narrow size range.

The example shows a mixture of two polystyrene latex standards with spherical diameters of 2.5 µm and 5 µm.

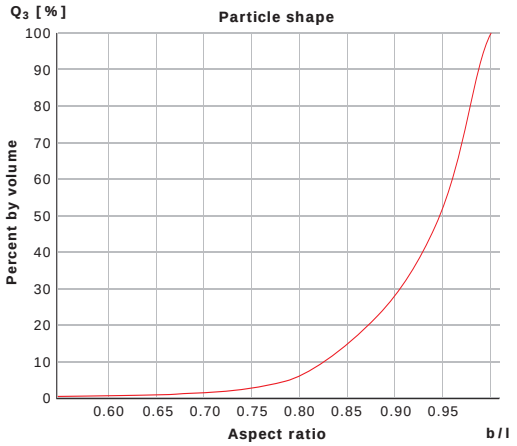


High detection efficiency and good reproducibility

Even smallest amounts of oversized or undersized particles are reliably detected with short measuring times. Moreover, thanks to the high resolution the shape of very small particles is analyzed with precision, for example the aspect ratio of particles smaller than 10 microns is reliably detected.



The example shows fine metal powder with a particle size distribution from 5 µm to 20 µm like it is used, for example, for additive manufacturing (3D printing), as solder powder or for other powder-metallurgical production processes.



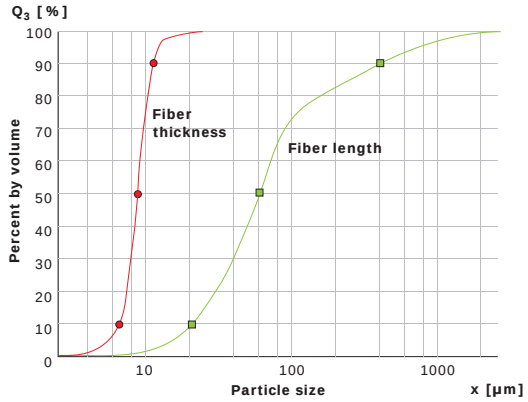
Measurement of fiber length and thickness

The new optical design with improved depth of focus and higher resolution provides consistently sharp images even of very long, thin fibers. Thus it is possible to simultaneously measure both the length and thickness of the fibers quickly and reproducibly.

Zoom camera:
Diameter < 10 µm

Basic camera:
Fiber length up to 2.5 mm

The example shows fibers with a thickness of less than 10 microns and a length of up to 2.5 mm. Fiber length and diameter are determined in one single measurement with the split view optical system.



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Precise measurement in liquids

A new generation of the X-Flow module for analysis of particles in liquids has been developed for the CAMSIZER X2. The new X-Flow accepts larger sample amounts in a liquid volume up to 900 ml. Thanks to the optimized circulation system particle sizes up to 1 mm are easily dispersed.

Technical Data		
CAMSIZER® X2		
Measurement ranges	Module “X-Dry” with “X-Fall” plug-in cartridge	10 µm to 8 mm
	Module “X-Dry” with “X-Jet” plug-in cartridge	0,8 µm to 5 mm
	Module „X-Flow“	0.8 µm to 1 mm
Measurement principle	Dynamic Digital Image Processing (ISO 13322-2)	
Measurement time	approx. 1 to 3 min. (depends on required measurement statistic)	
Number of cameras	2	
Sample volume	<20 mg – 500 g (depends on sample type and measurement mode)	
Measurement speed	>300 images/sec	
Width of analysis area	approx. 20 x 20 mm	
Resolution	0.8 µm per pixel	
Measurement parameters	Particle size	smallest diameter, length, mean diameter etc.
	Particle form	Aspect ratio breadth to length, symmetry, sphericity, convexity etc., acc. to ISO 9276-6
Instrument data	Dimensions (H x W x D)	approx. 580 x 850 x 570 mm
	Weight (without PC)	approx. 50 kg
	Compressed air supply	approx. 5.5 - 8 bar
	Compressed air consumption	approx. 50 - 140 l/min
The CAMSIZER X2 is CE-tested and follows the relevant guidelines and standards. The vacuum cleaner is included in the delivery scope of the X-Dry module.		
Options	Cyclone Software complying with FDA rule 21 CFR Part 11 IQ/OQ/PQ documentation acc. to GLP/GMP	
Accessories	Different hoppers,chutes and nozzles allow for adaptation of the CAMSIZER X2 to the requirements of the particular sample material, depending on flowability and sample volume	

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Retsch Technology GmbH
Retsch-Allee 1-5
42781 Haan · Deutschland

Phone +49(0)2104/2333-300
Fax +49(0)2104/2333-399

E-Mail info@retsch-technology.com
Internet www.retsch-technology.com

DISTRIBUTED IN CANADA BY:

ATS Scientific Inc. 4030
Mainway Burlington ON
L7M 4B9
1-800-661-6700
www.ats-scientific.com

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980.2008/E-04-2016