Malvern | Material relationships

PARTICLE SIZE

ZETASIZER **AT**

ON-LINE MEASUREMENT OF PARTICLE SIZE FOR NANO-SCALE PROCESSES

INTRODUCING THE ZETASIZER **AT**

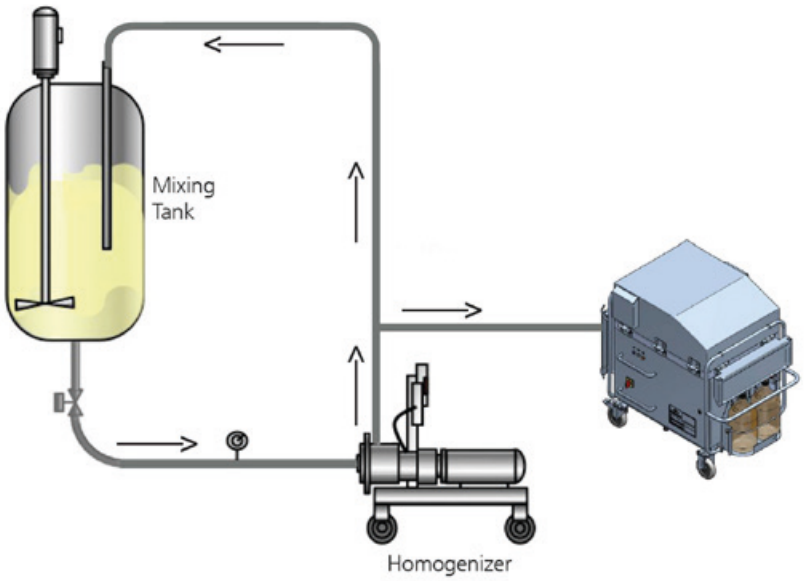
The Zetasizer AT is an automated system for on-line measurement of particle size by Dynamic Light Scattering (DLS), designed to minimize sample consumption and act as a versatile, mobile Process Analytical Tool in development laboratories, pilot and production plants.

Sampling system of the Zetasizer AT extracts a small volume of sample from the process, dilutes the sample if required and delivers it to the analyzer.

Suitable for stable samples, not prone to rapid agglomeration or changes during transport through tubing, the Zetasizer AT system delivers precise results and eliminates potential errors associated with manual measurements.

Zetasizer AT can also be operated as an at-line DLS system, allowing the user to perform manual measurements as they would on a Zetasizer Nano system.

Bringing the power of DLS closer to the process enables pharmaceutical scientists to monitor the progress of high shear homogenization of oil-in-water nanoemulsions used to deliver drugs into the body. By measuring the reduction in droplet size on-line, the user can monitor the progress of the process and stop mixing when the target is achieved, reducing the risk of over-processing, saving energy and time, while providing confidence that the emulsion is going to meet the required quality standard, for example pass efficiently through sterilization filters.



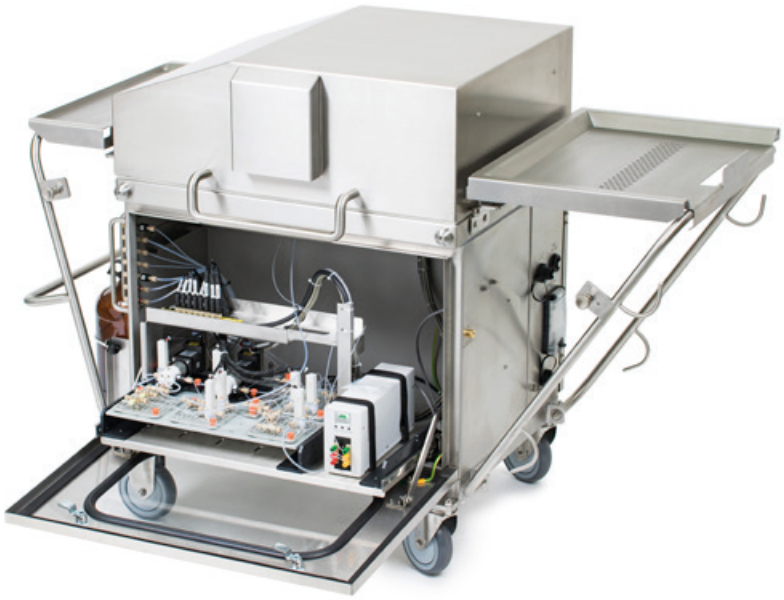
Key benefits

- Ability to monitor processes involving nanoscale particles or droplets in a timely manner
- Ability to track changes in particle size with time and determine the end point
- Automated sampling system minimizing operator input and sample consumption
- Easy transfer of laboratory DLS methods
- Utilizes Malvern's Universal Interface (Malvern Link II) for system integration

The Zetasizer AT can also be used to monitor and study a variety of processes involving nanoscale particles or droplets. For example, many pharmaceutical active ingredients are poorly soluble and processes like nanomilling are used to reduce the particle size to well below 1 µm in order to improve solubility.

Automatic measurement should start after the raw material is size-reduced sufficiently to fit within DLS measurement range. The Zetasizer AT periodically draws small amounts of sample from the main process. It dilutes the sample using a predetermined sequence and performs automatic measurements, providing a data point every few minutes.

This data enables the developer to track size reduction over time and determine when the target is achieved. Availability of time relevant measurements offers potential for speeding up development cycles, reducing the number of test batches as well as side benefits like reducing chances of degradation or contamination of the API by overgrinding.



ZETASIZER **AT** SPECIFICATIONS

Parameter	Specification
Measurement range (diameter)	1.0 nm – 1.0 micron* (0.3 nm – 10 microns* at-line) *Sample dependent
Measurement principle	Dynamic Light Scattering
Accuracy	Better than +/-2% on NIST traceable latex standards
Precision / Repeatability	Better than +/-2% on NIST traceable latex standards
Sensitivity	0.1 mg/mL (Lysozyme) (at line)
Sample Interface	1/16" OD (0.040" ID) or 1/8" OD (1/16" ID) tube
Pressure	0 - 3 Bar (0- 44 psi) at sample inlet
Temperature	0 – 90 °C (at line)
Minimum sample volume	4 ml (application dependent)
Dilution	up to 1:50 / infinite (application dependent)
Power	110-240 VAC, 6 A max, 50-60 Hz
Compressed Air for optics purge (optional)	2-8 Bar (29-116 psi) per ISO8573-1:2010 [1.7.2]
Ingress Protection (IP) rating	IP54
Operating temperature:	+10°C to +30°C
Humidity:	10% - 80% (non-condensing)
Dimensions (W, D, H)	97 x 66.2 x 95 cm (38.2 x 26.1 x 37.4 inch)
Weight	137 kg (302 lb)
Conforms to	Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC Pressure Equipment Directive 97/23/EC BS EN 61010-1:2010 BS EN 60204-1:2006 + A1:2009 BS EN 61326-1:2006 CE marked

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