

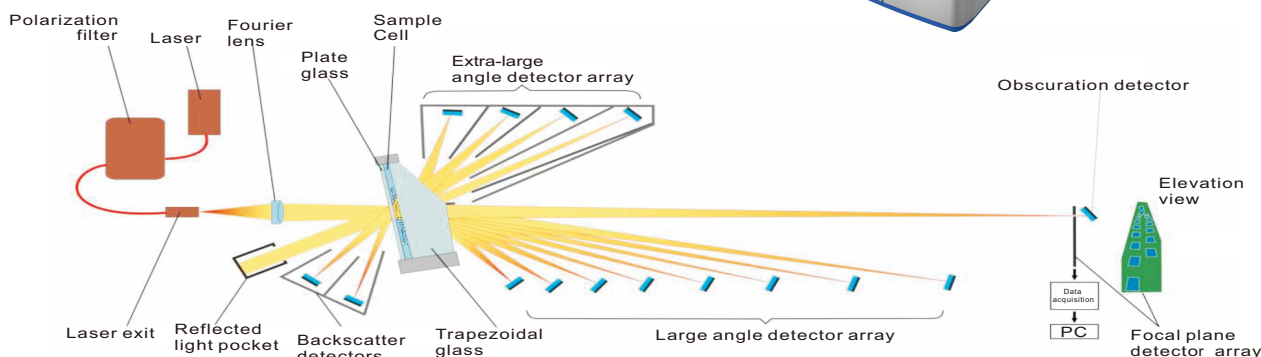
Leading Innovation in Particle Size Analysis



linkoptik

LT3600 series - Intelligent particle size analysis

The LT3600 represents a new generation of particle sizing instrumentation, used by many companies and research institutes across a wide range of industries. It employs the technique of laser diffraction to measure particle size distributions from 0.015 μm up to 3600 μm with accuracy and precision. When combined with a range of wet and dry sample dispersion accessories, it addresses a wide variety of challenging applications.



Principle Diagram

Innovations and Features

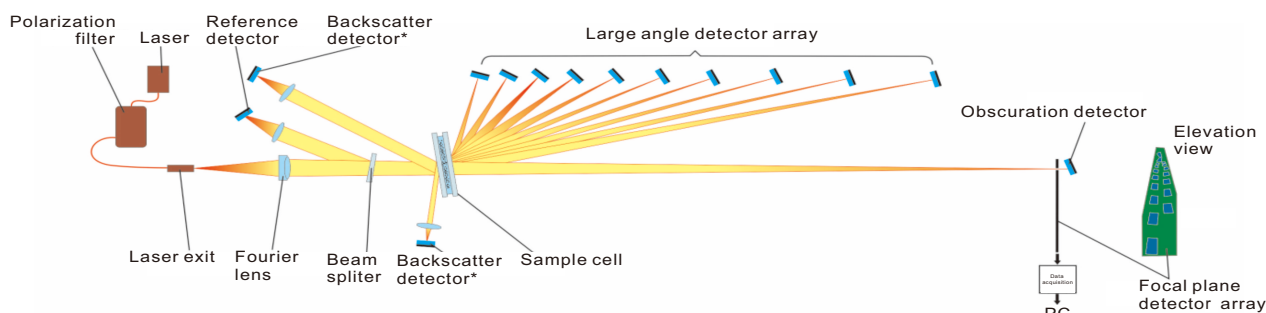
- Fully complies with ISO13320 standard
- Improved inversion algorithm and self-adaptive technique with high resolution and sensitivity
- Size range from 0.015 μm - 3600 μm with no need for a lens change
- Data acquisition rate up to 20 kHz
- Solid-state laser light source with automatic temperature stabilizing system
- Spatial filter and polarization combined with optical fiber technology
- Correction of anomalous change of airy disk (ACAD) in diffraction
- Tilted and trapezoid cell windows
- Unique optic configuration with extra-large angle detector array and no dead detection zone
- Dual-drive dispersion and integration technology
- Continuous dispersant level sensing and control

Specifications	LT3600	LT3600 Plus
Principle	Laser light scattering	
Analysis	Full Mie theory and Fraunhofer scattering	
Size range	0.02 μm - 3600 μm	0.015 μm - 3600 μm
	No need for lens change and calibration	
Detection system	Extra-large angle detector array with area compensation and gridded holder, no dead detection zone within angular range	Extra-large angle detector array with area compensation and gridded holder, no dead detection zone within angular range, integrated backscatter detectors
Cell Windows	Tilted and trapezoid cell windows	
Light source	Max 20 mW, 638 nm solid-state laser with integrated thermostat	
Spatial filter	OF filter with polarization	
Alignment	Smart rapid alignment with full automation	
Typical measurement time	Less than 10 seconds	
Data acquisition rate	Up to 20 kHz	
Accuracy	Better than 0.6% (the mean size of NIST latex standard)	
Repeatability	Better than 0.5% (sample and sample preparation dependent)	
Optical system weight	28 kg	28.5 kg
Optical system dimensions	650mm x 300mm x 320mm	



LT2200 series - Intelligent particle size analysis

The LT2200 series is newly designed for a practical, reliable solution to the routine particle sizing needs of a variety of industries. It is a flexible and modular, yet fully integrated particle sizing system with a high performance/price ratio and assured measurement capability from submicron to millimeter, wet or dry, from milligram quantities of precious pharmaceuticals to the measurement of bulk chemicals and minerals.



Principle Diagram

Innovations and Features

- Fully complies with ISO13320 standard
- Improved inversion algorithm and self-adaptive technique with high resolution and sensitivity
- Size range from 0.02 μm - 2200 μm with no need for a lens change
- Data acquisition rate up to 20 kHz
- Solid-state laser light source with automatic temperature stabilizing system
- Spatial filter and polarization combined with optical fiber technology
- Correction of anomalous change of airy disk (ACAD) in diffraction
- Unique optic configuration with large angle detector array and no dead detection zone
- Dual-drive dispersion and integration technology
- Continuous dispersant level sensing and control

Specifications	LT2200	LT2200E
Principle	Laser light scattering	
Analysis	Full Mie theory and Fraunhofer scattering	
Size range	0.02 μm - 2200 μm	0.1 μm - 1200 μm
	No need for lens change and calibration	
Detection system	Large angle detector array with area compensation and gridded holder, no dead detection zone, integrated backscatter detectors	Large angle detector array with area compensation and gridded holder, no dead detection zone within angular range
Cell Windows	Parallel and tilted	
Light source	Max 20 mW, 638 nm solid-state laser with integrated thermostat	
Spatial filter	OF filter with polarization	
Alignment	Smart rapid alignment with full automation	
Typical measurement time	Less than 10 seconds	
Data acquisition rate	Up to 20 kHz	
Accuracy	Better than 0.6% (the mean size of NIST latex standard)	
Repeatability	Better than 0.5% (sample and sample preparation dependent)	
Optical system weight	26 kg	25 kg
Optical system dimensions	660mm x 260mm x 317mm	



Sample dispersion units

The Linkoptik technical team is well versed in the mechanisms of particle dispersion and its importance in the particle size measurement process. The Hydrolink Wet and Aerolink Dry Sample Dispersion Units have been intelligently developed for optimal delivery of dispersing energies for uniform and comprehensive dispersion of a variety of samples with different densities and size distributions, from regular to irregular, or fragile to agglomerated.

Hydrolink

Full-automatic wet dispersion unit



- Standard volume maximum 1000 ml
- Dual-drive design and separate control for pump and stirrer to ensure uniform dispersion and delivery of wide distribution or high density samples
- Automatic bubble elimination technology
- High efficiency ultrasonic dispersion unit
- Continuous and adjustable ultrasonic power
- Suspended liquid level sensing and continuous liquid volume control technology
- Automatic sample processing and cleaning
- SOP control and multi-user SOP sharing

Hydrolink SE

Full-automatic wet dispersion unit



- Standard volume maximum 1000 ml
- Powerful impeller pump and dual-stirrer to ensure uniform dispersion and delivery of wide distribution or high density samples
- Automatic bubble elimination technology
- High efficiency ultrasonic dispersion unit
- Continuous and adjustable ultrasonic power
- Suspended liquid level sensing and continuous liquid volume control technology
- Automatic sample processing and cleaning
- SOP control and multi-user SOP sharing

Hydrolink SV

Small volume wet dispersion unit



- Minimum sample volume 40 ml
- Stainless steel design and chemically compatible with a wide variety of organic and inorganic dispersants
- Built-in ultrasonic unit is optional
- Controlled by SOP or circulation and stirring keys

Aerolink

Dry dispersion unit



- Based on multiple dispersion mechanisms to achieve effective dispersion of diverse samples
- Automatic control of air pressure, 0 bar - 4.5 bar adjustable
- Air pressure control accuracy ± 0.1 bar
- Sample feed rate controlled by SOP with precision better than 1%
- Venturi dispersion unit with variable energy, suitable for all types of samples
- Sample tray with continuously adjustable gap
- Automatic real-time vacuum detection to avoid contamination of the sample cell
- Straight-through sample path to reduce sample adherence



Spraylink - Real time spray dynamics

Spray particle size and its control determine the final quality of many products during application, such as drug delivery during inhalation, nasal sprays, fuel sprays, aerosols, fuel efficiency evaluations for rocket launches and nozzle research within the energy and chemical industries. High-speed movement of spray particles with wide particle size ranges and the irregularity of spray patterns requires high adaptability and high-speed diffraction signal processing.

Spraylink has been specifically designed to meet these challenges, delivering routine, accurate and precise spray particle size measurement in the size range of 0.1 μm to 2080 μm and concentrations up to 90% obscuration with no need for a lens change. The Spraylink system integrates an optimized high-sensitivity detection and holographic signal processing system, combined with high concentration compensation technology to greatly reduce the effects of multiple diffraction.

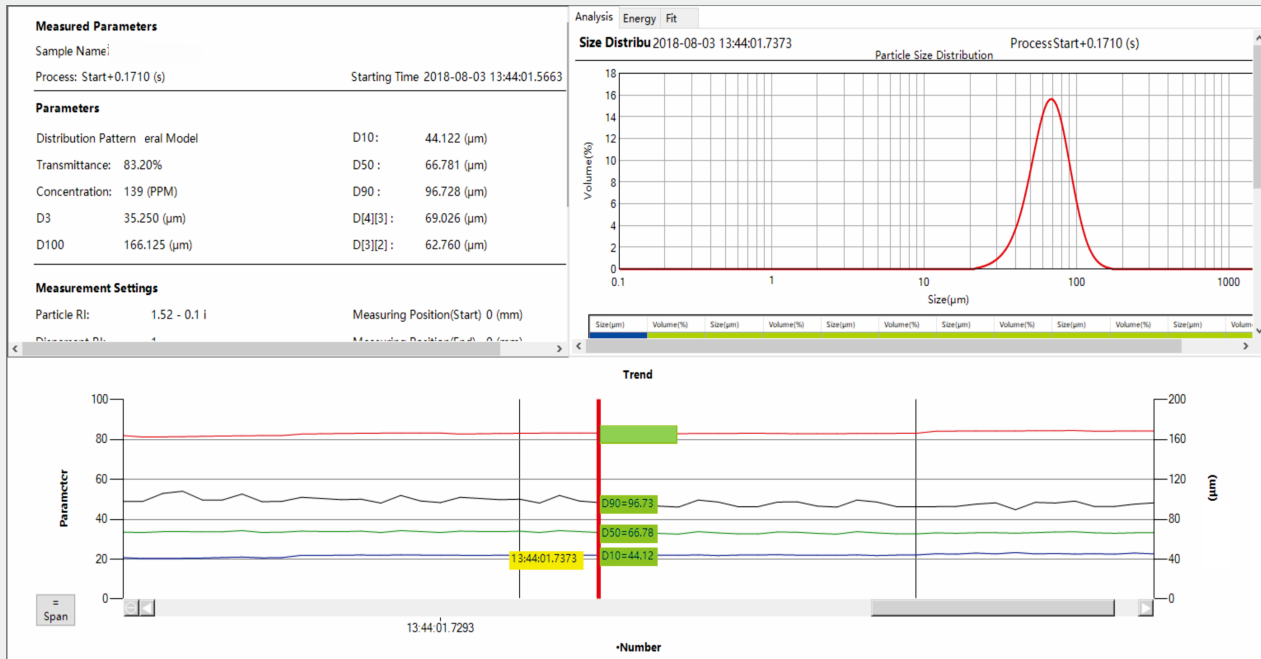
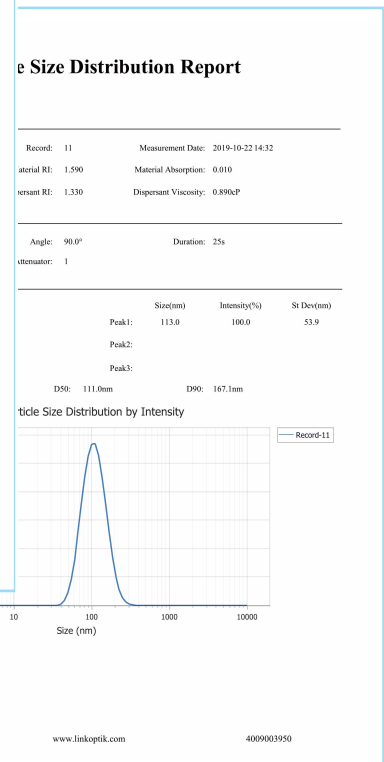
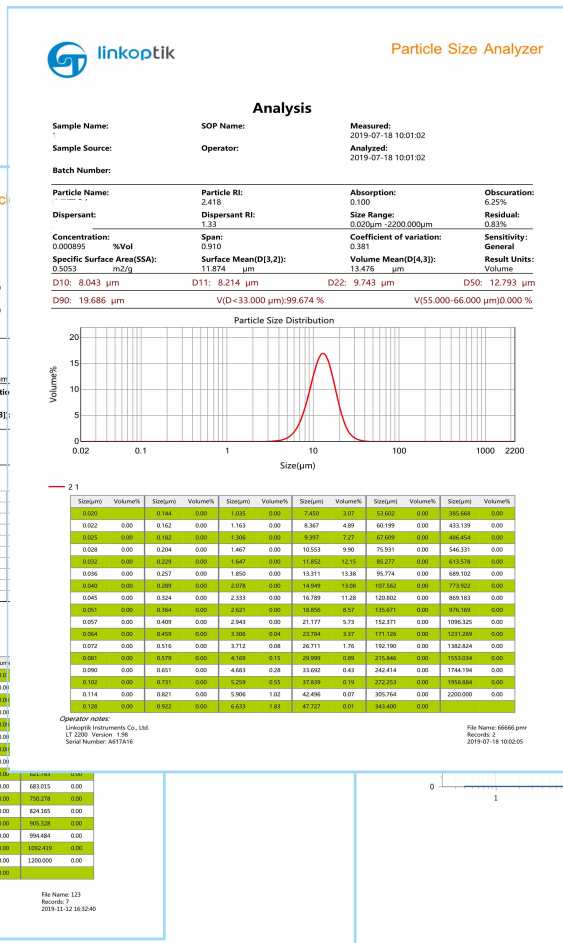


Innovations and Features

- 10 kHz maximum acquisition rate, perform 10,000 measurements per second and capture the dynamics of size change in every 0.1 ms interval
- Unique lens configuration and optimized optics enable measurements over large working ranges
- Measurement across a wide range (0.1 μm - 2080 μm) with no need for optics change
- The newest algorithm ensures accurate particle size distributions can be measured at high obscuration
- Rapid auto-alignment
- Lens protection with air purging
- Customizable optical bench arrangement
- Measurement synchronization via flexible triggering options
- Stable construction and full metal cover and optical bench design
- Instantaneous playback of size history and frame-by-frame event analysis
- Analysis of the dynamic changes of particle size distribution with time
- Overlay of results at different time points

Specifications	Spraylink
Principle	Laser scattering
Optical models	Mie theory and Fraunhofer scattering, including high concentration compensation technique
Size range	0.1 μm - 2080 μm , with no need for changing lens
Working range	150 mm at 0.3 μm , >1800 mm at 7 μm
Concentration range	Maximum obscuration : 90% (dependent on particle size range)
Detection system	42 element detector array with area compensation and gridded holder
Measurement triggering	Internal: Based on transmission or light scattering levels; External: Based on TTL input or simple switch trigger
Light source	Max 20 mW, 638 nm solid-state laser with integrated thermostat
External synchronization	TTL trigger output
Alignment	Automatic rapid alignment
Enclose rating	IP 65 for transmitter and receiver modules
Acquisition rate	Continuous mode: 1 Hz, Rapid mode: 1 kHz, 2.5 kHz, maximum 10 kHz
Accuracy	Better than $Dv50 \pm 0.5\%$ (NIST-traceable latex standard)
Repeatability	Better than $Dv50 \pm 0.5\%$ (NIST-traceable latex standard)
Optical system weight	28 kg
Optical system dimensions	1100mm x 460mm x 538mm (standard optical bench)







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Correction of anomalous change of airy disk (ACAD) in diffraction



Optimization of inversion algorithm and self-adaptive technique



Spatial filter and polarization combined with optical fibre technology



Tilted and trapezoid cell windows



Dual-drive dispersion and integration technology



High speed sampling design



Measurement result playback



Condensation control

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