

# Bettersize

BETTER PARTICLE SIZE SOLUTIONS

# Bettersizer ST

## Your One-Stop QC Tool

PARTICLE SIZE



# Your One-Stop QC Tool

The Bettersizer ST is an automated laser diffraction particle size analyzer designed for industrial quality control. Its patented DLOS (Dual Lens Optical System) guarantees the instrument to provide **consistent and reliable** particle size distribution results. The SOP (Standard Operating Procedure) and automated analysis procedures are designed to help you save valuable time for quality inspection.

Skip complex operations with [Bettersizer ST](#): Simply click "Start", add the sample, and Bettersizer ST will provide the particle size distribution analysis for you.

## INDUSTRY

### Mining and Minerals

- Kaolin
- Barite
- Calcium Carbonate

### Ceramics

- Aluminum Oxide
- Zirconium Dioxide

### Abrasives

- Carborundum (Silicon Carbide)
- Calcium Carbonate (Calcite)
- Carbon (Diamond)

### Building Materials

- Cement
- Gypsum
- Clay

### Paints and Pigments

- Titanium Dioxide
- Iron Oxide

### Agrochemical

- Pesticides
- Herbicides
- Insecticides

### Metals

- Aluminium Powder
- Copper Powder
- Molybdenum Powder

### Batteries

- Lithium Iron Phosphate
- Lithium Cobalt Oxide

### Chemicals

- Catalyst
- Additives

### Plastics

- PVC Grains
- EPS Particles

## BETTERSIZER ST FEATURES AT A GLANCE

Excellent Accuracy

Outstanding Repeatability



Legendary Ease-of-Use

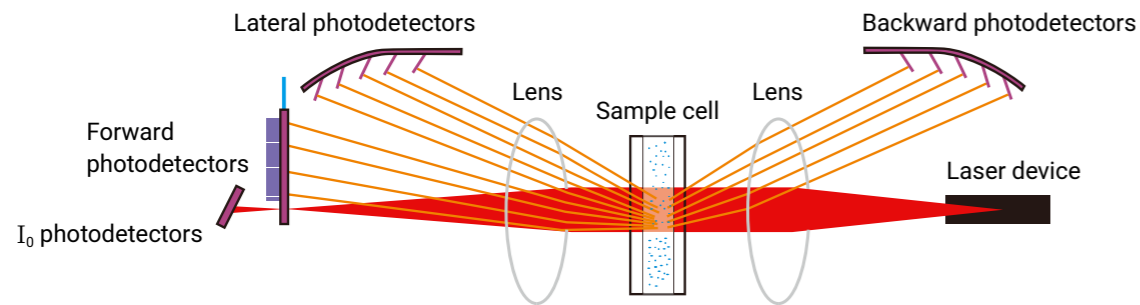
Cost-Efficiency & Robustness

"Measurement consistency allows us to verify the outcome of the process without worrying about measurement errors. The system performance and reliability are excellent in manufacturing CaCO<sub>3</sub>. Auto-cleaning between samples is also made easy by Bettersizer ST. It has a very simple and intuitive user interface. Tests can be conducted by multiple production personnel due to its ease of use."

Sadia Munawer  
QC Manager of Shaheen Grinding Mills (Pvt) Ltd.

## INNOVATIVE DLOS TECHNOLOGY

The DLOS (Dual Lens Optical System) is a patented optical system designed by Bettersize Instruments. In DLOS, one single laser source and two large Fourier lenses are utilized, and the combination of wide-angle forward, lateral and backward photodetectors allows consistent and accurate results with a measurement range from 0.1 to 1000  $\mu\text{m}$ .



## Features

- High resolution and accuracy ensured by two large Fourier lenses
- Expands measurement range with 86 high-speed photodetectors
- Compact design prevents using folding optics
- Continuous incident light with consistent wavelength provided by one single laser source

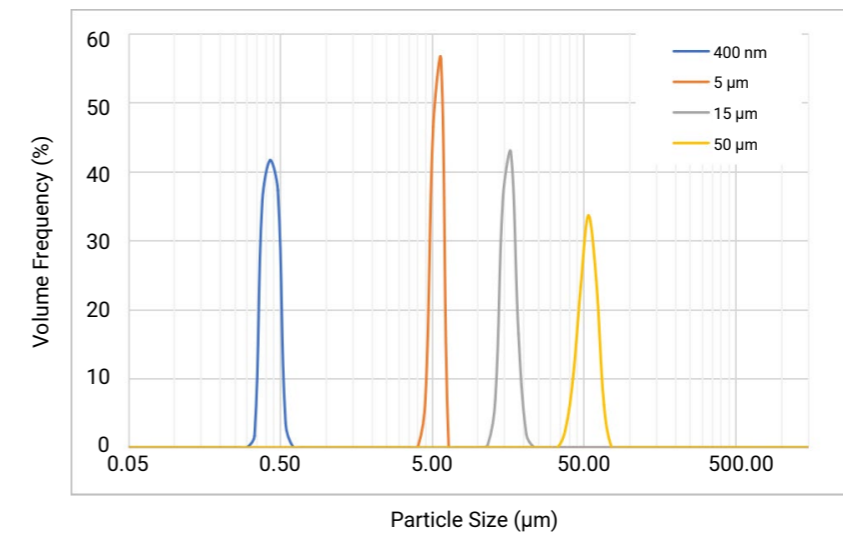
## Advantages

- **Measurement range: 0.1 – 1000  $\mu\text{m}$**
- **Avoid misalignment**  
The compact design of DLOS removes folding optics that are susceptible to misalignment
- **More reliable results**  
Only one laser source is utilized to provide a continuous scattering spectrum with consistent wavelength
- **Cost-efficient**  
Reliable results without a second laser source leads to cost efficiency

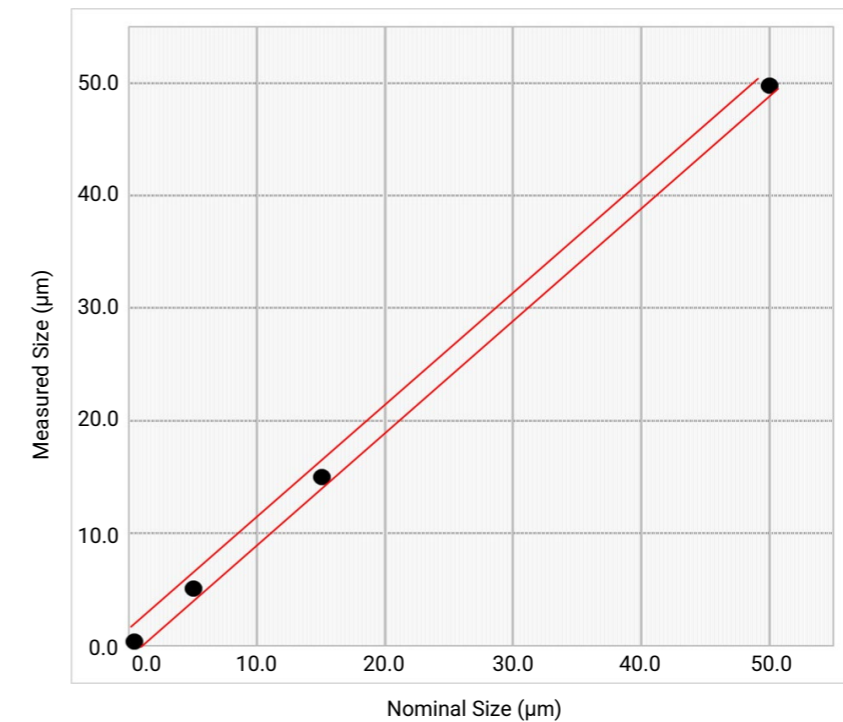


## EXCELLENT ACCURACY

### Accuracy Verification of Standards



Duke standard samples were measured separately by the Bettersizer ST, showing the distribution peak in the correct position and narrow distribution with high accuracy.



The red line is the nominal size range of standards  $\pm 1.0\%$ , and the black dots are the measured sizes. As shown in the figure, the measurement accuracy of Bettersizer ST for standards is within 1%.

"The operation and measurement procedure of Bettersizer ST is convenient and easy-to-follow, it helps us build an accuracy benchmark of the measurement result, which has revolutionized the quality of our products."

Liaoning Meishuo Mineral Products Co. Ltd

## OUTSTANDING REPEATABILITY

Exceptional repeatability provided by Betsizer ST ensures the reliability of the results. Rapid measurements with **consistent and reliable** results can ease your workload on quality control.

### Excellent Repeatability From:

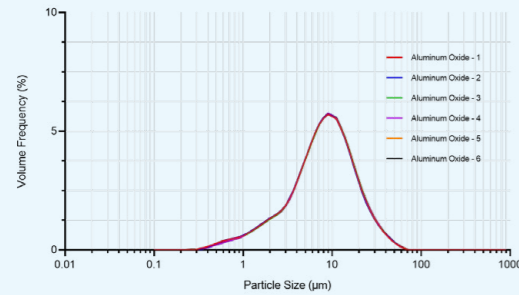
- Stability of signal transmission systems
- Efficient dispersion system
- Automatic alignment keeps the instrument always in optimum condition
- Signal acquiring rate up to 3500 times/second



### Repeatability Tests

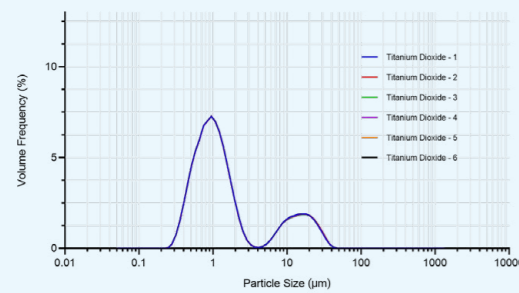
The outstanding repeatability of Betsizer ST, demonstrated by the following two consecutive tests.

#### Aluminum Oxide



Sample Name	D05 (µm)	D10 (µm)	D50 (µm)	D90 (µm)	D95 (µm)
Aluminum Oxide - 1	1.337	2.211	8.693	22.30	29.10
Aluminum Oxide - 2	1.352	2.212	8.655	22.24	29.27
Aluminum Oxide - 3	1.364	2.260	8.789	22.59	29.50
Aluminum Oxide - 4	1.444	2.309	8.809	22.69	29.66
Aluminum Oxide - 5	1.360	2.233	8.744	22.42	29.39
Aluminum Oxide - 6	1.388	2.251	8.738	22.35	29.31
RSD	2.77%	1.63%	0.66%	0.78%	0.66%

#### Titanium Dioxide



Sample Name	D05 (µm)	D10 (µm)	D50 (µm)	D90 (µm)	D95 (µm)
Titanium Dioxide - 1	0.454	0.534	1.158	16.08	22.36
Titanium Dioxide - 2	0.454	0.534	1.158	16.23	22.65
Titanium Dioxide - 3	0.453	0.534	1.158	16.20	22.68
Titanium Dioxide - 4	0.454	0.534	1.158	16.28	22.72
Titanium Dioxide - 5	0.452	0.532	1.157	16.31	22.76
Titanium Dioxide - 6	0.454	0.534	1.156	16.22	22.65
RSD	0.18%	0.15%	0.07%	0.49%	0.63%

"The instrument has very good stability. We are now at the stage of new product research and development, most of the samples are in flake structure, and Betsizer ST helps us measure the particle size differences of different batches, which is helpful for our R&D and product quality control."

Daoming Optics & Chemicals Co. Ltd

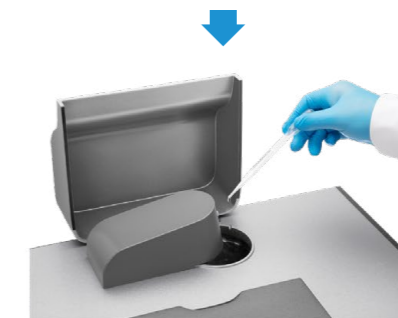
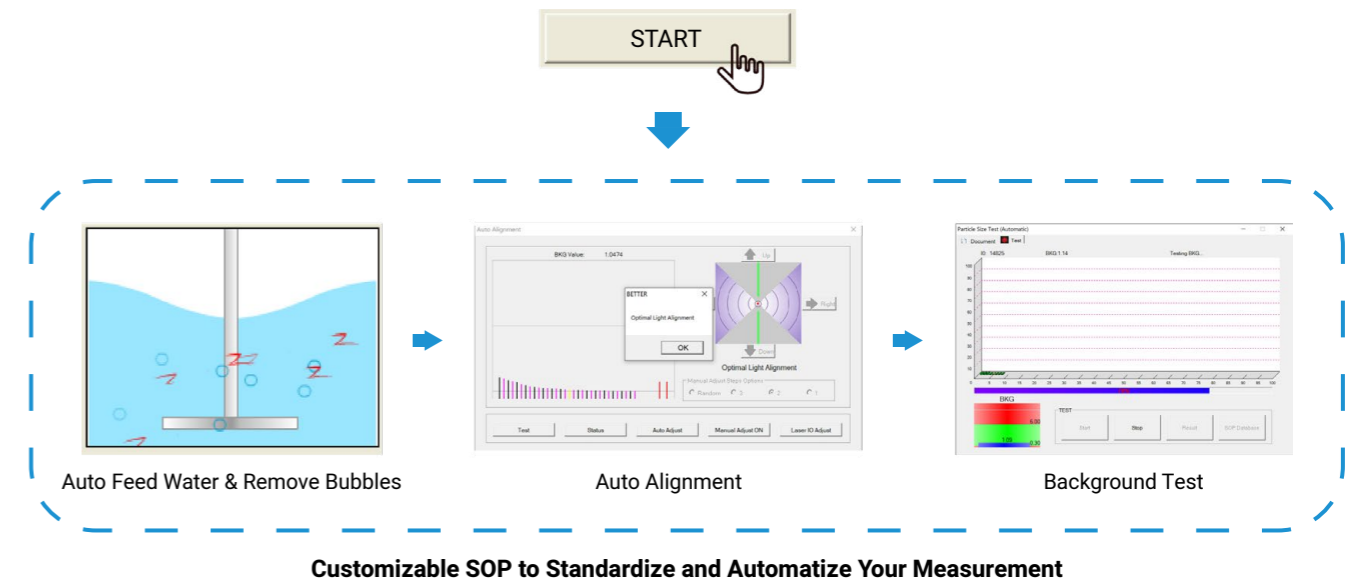
## EASE YOUR WORKLOAD IN ALL ASPECTS

The Betsizer software provides various functions that greatly reduce your workload.

### I . Intuitive Software

#### Standard Operating Procedure (SOP)

SOP is an easy solution for standardized and automatic testing. It ensures the measurement results are operator-independent, objective and reliable.

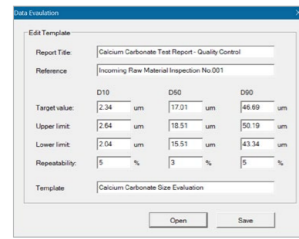


**Add Sample**

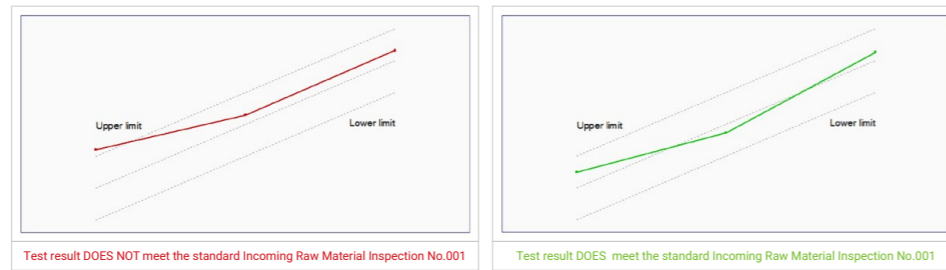


**Generate Measurement Report**

## II . Intelligent Data Evaluation for Quality Control



"Data Evaluation" function to customize standards.



"Data Evaluation" report provides a quick snapshot of your sample, so that you can easily determine if your sample meets your QC requirement and identify where it's disqualified.

## III . Performance Validation

With the independent Performance Validation function, the software can automatically generate reports that complies with ISO 13320 and pharmacopoeias.

**Bettersize**  
Bettersizer ST Performance Validation Certificate

Operator: Testing      Instrument Serial Number: 01.10.AC.000732  
Test Time: 2021-09-18      Guideline: USP/EP/JP/ChP  
Repeatability: D10<=5.0% D50<=3.0% D90<=5.0%  
Accuracy: D10<=5.0% D50<=3.0% D90<=5.0%

Sample Name:Corundum(WRP)	Sample Source:Bettersize	Catalog No.:X009.0005.0100	Packaging Lot#---
No.	D10(um)	D50(um)	D90(um)
1	73.19	112.8	173.4
2	73.12	112.8	173.3
3	73.15	112.9	173.4
4	73.28	112.0	173.0
5	73.25	112.8	173.0
6	73.15	112.8	173.3
Average	73.19	112.8	173.2
Target	71.33+-3.57	110.5+-3.32	109.3+-8.47
Tolerance	64.37-78.64	103.9-117.2	152.7-186.6
Accuracy	Qualified	Qualified	Qualified
Repeatability	0.09%Qualified	0.05%Qualified	0.11%Qualified

**The Performance Validation of this Product has PASSED!**

I certify the performance validation has been performed according to the documented Bettersize test procedures and the results obtained are within compliance.

Tester Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## IV . System Inspection

Diagnostic scan: System inspection checklist.

**System Inspection**

Instrument	Wet dispersion unit	Dry dispersion unit
1 Laser	1 LLS	1 Vacuum
1 Forward detectors	1 Inlet and Outlet tubing	1 Compressor
1 Lateral detectors	1 Inlet and Outlet pump	1 Pressure sensor
1 Backward detectors	1 Cell assembly	1 Measure window assembly
1 IO detector	1 Circulation tightness	1 Funnel feeding rate
1 Signal amplifier	1 Circulation motor control	1 Feeding speed
1 AD converter	1 Power supply system	1 Power supply system
1 USB signal system	1 Circulation control system	1 Dispersion unit control
1 Power supply system	1 Ultrasound power supply	
1 Sample cell	1 Ultrasound energy convertor	
1 Camera 1		
1 Light source 1		
1 Camera 2		
1 Light source 2		

Buttons: Diagnose, Stop, Copy, Close

## COST-EFFICIENCY & ROBUSTNESS

### Outstanding Robustness

- Integrated casting of the bottom plate to protect the instrument
- Accurate measurements can be achieved even after a robustness test
- Long-life fiber semiconductor laser source
- Durable circulation tank with casted stainless steel
- Power-adjustable ultrasonic disperser with dry run protection



### Compact Design

- Save valuable workspace for factories and laboratories with an internal wet dispersion system
- The DL0S ensures result accuracy and reliability, while avoiding folding optics that are susceptible to misalignment

### Simple Maintenance

- Simple disassembly of sample cells allows a quick cleaning, which can be easily accessed without professional tools and excessive clean formulations
- Auto-cleaning function for the circulation tank eases the maintenance work greatly
- Auto-cleaning process can be easily customized in the software



### Low Cost of Ownership

- Entry-level price for a laser particle size analyzer
- A measurement range that covers most applications can be achieved with DL0S without additional cost for a second laser source

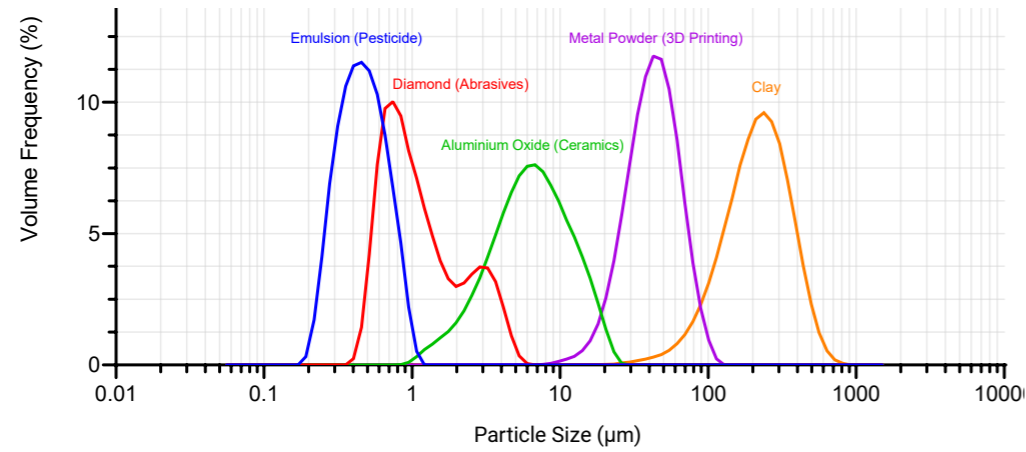
"This unit is very straightforward in its uses, has a good software and is simple to operate for various parameters. Bettersizer ST is compact compared to a lot of instruments! Overall, I found this product to be good value for the money."

Arfan Firdaos  
QC Supervisor of Clariant Specialty Chemicals Indonesia

# APPLICATIONS

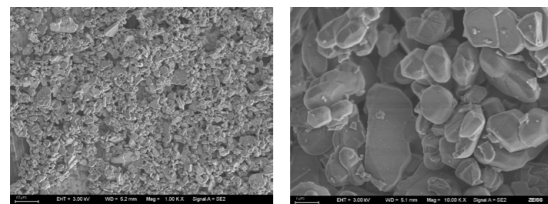
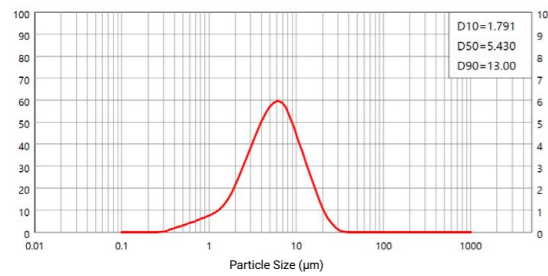
With its outstanding accuracy and repeatability, Bettersizer ST is a perfect QC tool for your every application and challenge.

Particle Size Distribution Measured by Bettersizer ST

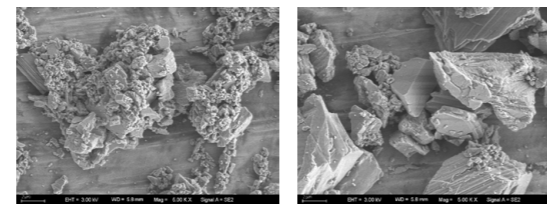
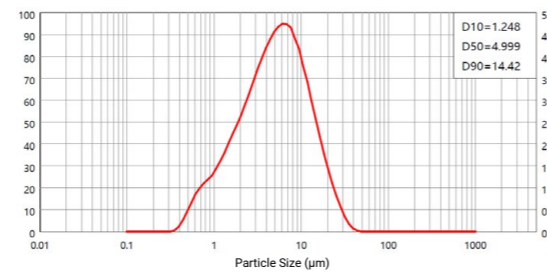


Here are some measurement examples from various industries:

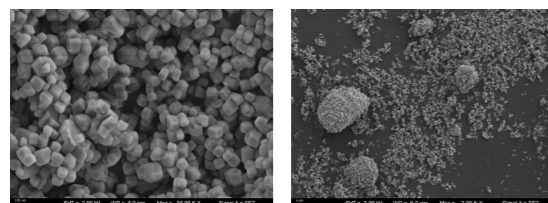
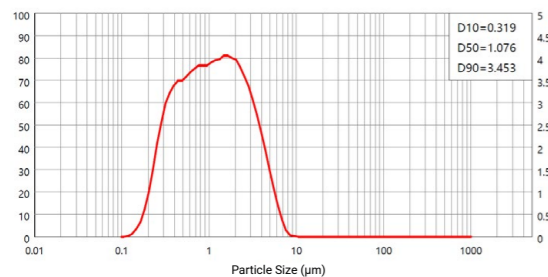
Aluminum Oxide



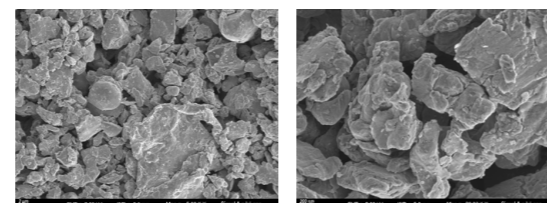
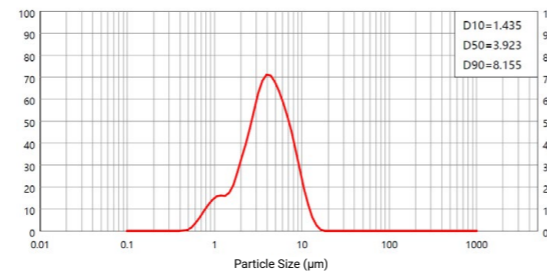
Ground Calcium Carbonate



Precipitated Calcium Carbonate



Alloyed Powder



# SPECIFICATION

Parameters Measured	
Particle size distribution	Suspensions, emulsions, dry powders
General	
Principle	Laser diffraction technology
Analysis	Mie scattering theory and Fraunhofer diffraction theory
Typical measurement time	Less than 10 seconds
Measurement Performance	
Measurement range	0.1 µm - 1000 µm
Accuracy error	≤1% (NIST certified standards)
Repeatability error	≤1% (NIST certified standards)
Number of size classes	≤100 (adjustable)
Feeding mode	Automatic wet circulation
Main Device	
Optical system	Patented DLOS (Dual Lens Optical Systems)
Laser	High-power fiber semiconductor laser (10 mW/635 nm)
Laser class	Class 1 laser product
Detector	86 photodetectors (forward, lateral and backward arrangements)
Measuring angle	0.031 - 159°
Dispersion Module	
Circulation speed	300 - 2500 r/min
Circulation flow rate	3,000 - 8,000 mL/min
Ultrasonication	Dry run protection, Max 50 W (adjustable)
Circulation tank capacity	600 mL
Software	
Conformity	21 CFR Part 11, ISO 13320, CE
Reports	Customizable reporting
System Parameters	
Dimensions (L x W x H)	660 x 420 x 320 mm
Weight	38 KG
Voltage	DC 24V, 221 W
Computer Configuration (Recommended)	
Computer interface	At least one high-speed USB 2.0 or USB 3.0 port required
Operating system	Windows 7 or higher
Hardware specification	Intel Core I5, 4GB RAM, 250GB HD

European Representative:



Characterization of  
particles • powders • pores

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