Particle Characterization Solutions:
Make Your Measurement Better

Bettersize

Best Value • Better Performance
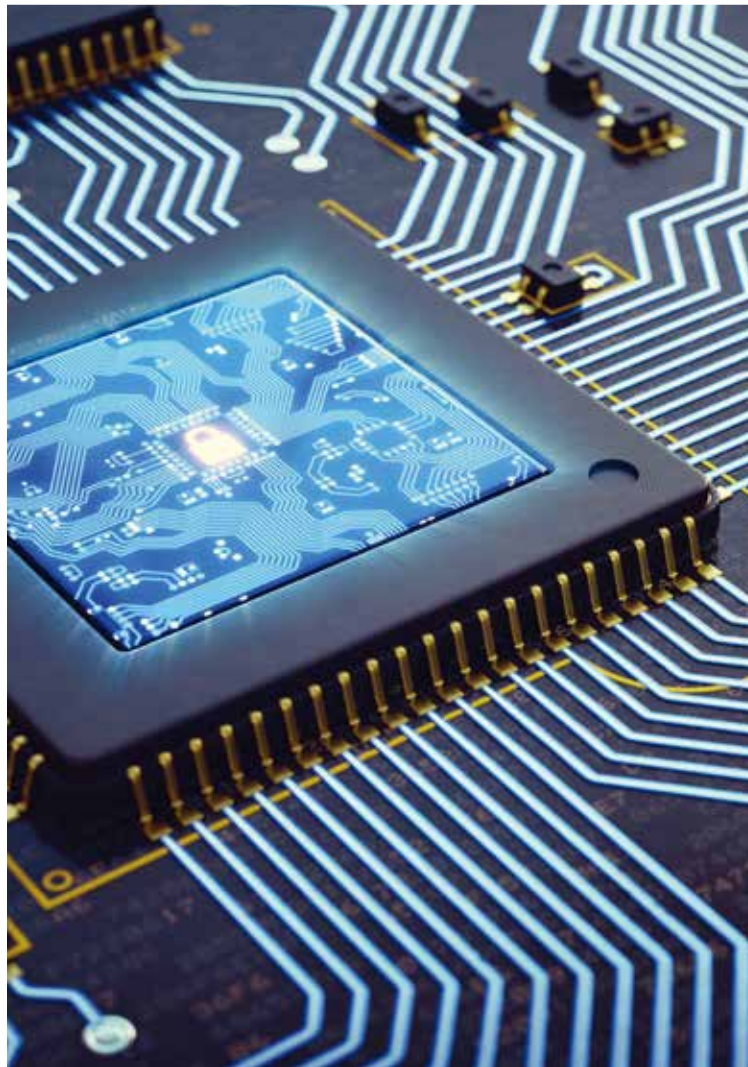
Best Value • Better Performance

MATERIAL CHARACTERIZATION SOLUTIONS

Bettersize provides particle size, particle shape, and powder characteristics analysis and solutions for laboratories and companies worldwide.

With over 20 years experience, Bettersize has introduced breakthrough technology in the field of particle characterization. By achieving high quality and superior performance, our instruments provide precise analysis results of particle size, particle shape, and powder characteristics, helping scientists and engineers to understand material properties, facilitate research and improve production efficiency.

Bettersize product line for particle size and shape analysis includes instruments of all needs and budgets, from basic to advanced research models. The instruments are widely applied in pharmaceutical development, battery materials, mining and minerals, metals, chemicals and surface coating industry, measuring materials with size ranges from nanometer to millimeter. Focused on technology innovation, instruments manufacturing, application support and after-sales services, Bettersize provides expertise and professional solutions and assures customers the highest confidence in our products.

PARTICLE ANALYSIS AND TESTING

Bettersize instruments offer three categories of particle properties analysis - **particle size distribution, particle shape analysis and powder characteristics testing**. The parameters determined with these analyses are crucial to physical properties of raw materials and the final application of products. Intelligent software enables automatic pre-programmed calculation. Measured results can be customized in multiple formats of graphs and tables, which can be exported as required.

Particle size ranges and models

Particle size range*	1nm	10nm	100nm	1µm	10µm	100µm	1mm	3.5mm	10mm
Laser Diffraction		Bettersizer S3 Series / 0.01µm to 3500µm							
		Bettersizer S2 Series / 0.01µm to 2000µm							
			Bettersizer Series / 0.1µm to 1000µm						
Dynamic Light Scattering	Nanoptic 90 / 1nm to 9500nm								
Automated Imaging				BeVision Series / 1µm to 10mm					

*Particle size ranges are sample dependent

INTERNATIONAL QUALIFICATION

All series of Bettersize instruments have passed ISO9001 international quality management system certification and the European CE certification. Laser particle analyzers obtained the approval of 21 CFR Chapter I Subchapter J, Part 1040.10 and 1040.11.

The software complies with the FDA 21 CFR Part 11 regulation, which ensures the validity and reliability of the measuring results, and solves the challenges associated with regulatory requirements.

PARTNERS AND CUSTOMERS

Delivering **over 10,000 instruments to 7,500 customers**, Bettersize provides services, applications and expertise to meet our clients' ever-changing needs.

A partial list of the Company's major partners and customers:

INNOVATIVE TECHNOLOGY

Guided by our passion for achieving higher accuracy of measurement performance, our talented R&D team work relentlessly to refine our technology, introduce new advancements and continuously improve our instrument's performance. Bettersize has many patented technologies that are applied to our instruments:

- DLOS - Dual Lenses Optical System
- DLOIS - Dual Lenses & Oblique Incidence Optical System
- Combination of Laser diffraction and automated imaging
- Refractive index measurement
- Standard Operation Procedure (SOP)

- Automatic centering function
- Automatic circulation & dispersion
- Accuracy calibration
- Dry run protection ultrasonic disperser
- Automatic water supply
- Small volume cell assembly system
- Real-time test result monitor

- Automatic water level monitor
- Dew point temperature monitor
- Anti-corrosive pump
- Dry sampling and dispersion
- Multi-language software system
- Test Report Conversion

APPLICATION INDUSTRIES

Bettersize offers a wide range of models to suit all testing requirements and budget. The instruments cover an expanded measuring range of particles from nanometer to millimeter (or micrometer). Each model is pack with exceptional performance and quality, providing reliable measurement day-in-day-out.

Bettersize systems are used worldwide in extensive industries. The instruments find applications in the following fields:

- Fuel cells
- Pharmaceutical development
- Agrochemical analysis
- Paints, inks and coatings
- Chemicals
- Mining and minerals
- Metal powders
- Ceramic
- Abrasive

- Electronics
- Cement
- Plastics and polymers
- Soil science
- Oil and petrochemicals
- Coal industry
- Food and drink
- Cosmetics

Bettersizer S3 Plus

PARTICLE SIZE AND SHAPE ANALYSIS ON ONE INSTRUMENT

Seamlessly combined laser diffraction and automated imaging into one system, Bettersizer S3 Plus can not only achieve a wide test range, but also provide reliable particle size distribution and particle shape information simultaneously. The excellent performance and intelligent operation mode make Bettersizer S3 Plus the best choice for research in need of particle size and shape characterization.

Features and Benefits:

- **Measuring range:**
  Particle size from 0.01μm to 3500μm.
  Particle shape from 4μm to 3500μm.

- **Dual Lenses & Oblique Incidence Optical System (DLOIS):** eliminates the fitting error of double beam system, enlarges detection angle (0.02 to 165 degree) and assures high sensitivity, resolution and accuracy.

- **Automated Imaging analysis to provide particle shape information,** especially useful for coarse particles; plus the ability to correlate particle size and shape analysis.

- **Automatic refractive index measurement** – ability to pre-determine the optical parameters of materials that will resemble the true value of the sample, enhancing the accuracy of the measurements of materials with unknown refractive index.

- Fully automatic operation minimizes workload as well as human errors.

- Measuring results of size and shape and displaying in real time, allows detecting any change immediately.

Bettersizer S3

STATE-OF-THE-ART PARTICLE SIZE ANALYSIS SYSTEM

Bettersizer S3 represents the latest Bettersize particle size analysis technology for wet dispersion solution. Measuring range from 0.01µm to 3500µm can meet the most stringent requirements of industries and research centers. DLOIS and automatic refractive index measurement ensure the accuracy and repeatability of results. SOP and fully automatic circulation & dispersion system ease the task of analysis and improve users experience.

Features and Benefits:

- Measuring range: Particle size from 0.01µm to 3500µm.

- DLOIS provides high precision and accuracy of results.

- Automatic refractive index measurement.

- Smart testing: Standard Operation Procedure (SOP) and fully automatic functions, not only simplify the operations, but also minimize operator error to ensure accurate results while reducing the workload.

Model	Bettersizer S3	Bettersizer S3 Plus
Measuring range	0.01-3500 µm (Particle size)	0.01-3500 µm (Particle size) 4-3500µm (Particle shape)
Measuring method	– Laser diffraction	– Laser diffraction – Automated Imaging
Dispersion system	Wet	Wet
Automatic refractive index measurement	Yes	Yes

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SMART HIGH-PRECISION LASER PARTICLE ANALYZER

Bettersizer S2 is a classic wet dispersion particle analyzer with a high degree of intelligence, excellent stability, and compact design. Bettersizer S2 combines a perfect balance of function and value.

Features and Benefits:

- **Measuring range:**
  Particle size from 20nm to 2000μm.

- **Dual Lenses Optical System (DLOS)** provides accurate results for particle size analysis.

- **Automatic alignment** ensures optical path stability.

- High-performance fiber lasers with long lifespan.

- Forward and backward detectors improves the detection of diffracted light.

- High-speed signal transmission system ensures stability and sensitivity of analysis.

- **Circulation & dispersion system:** automatic circulation, dispersion, mixing, inflow, rinsing, and cleaning. Water flow rate can be adjustable. A Selectable volume for circulating dispersed sample between 200-600ml.

- Equipped with dry run protection ultrasonic dispersing device.

- Standard Operation Procedure (SOP) offers smart testing experience.

BETTERSIZER S2 DERIVATIVE SERIES

BETTERSIZER S2-WD

Provide accurate particle size distributions for both wet and dry dispersions.

- Measuring range:
  Wet dispersion: 0.02 to 2000µm
  Dry dispersion: 0.1 to 2000µm

- Easy to convert between wet and dry mode.

BETTERSIZER S2-LS:

Designed for using organic and aqueous solvents.

- Measuring range:
  Particle size from 20nm to 2000µm.

- Corrosion-resistant circulation system made of stainless and Teflon makes possible the use of organic and aqueous solvents as well.

- Low volume reduce solvent cost and pollution.

BETTERSIZER S2-G:

Measure particles as small as 10nm in diameter.

- Measuring range:
  10nm to 800µm.

- Short laser wavelength.

BETTERSIZER S2-E:

Entry level model of Bettersizer S2 family.

- Measuring range:
  400nm to 2000µm.

- Highest performance-price ratio.

PRACTICAL AND ECONOMICAL PARTICLE SIZE ANALYZER (COMPACT MODEL)

Bettersizer ST is a fully automated wet dispersion particle size analyzer with smart operation system. Using DLOS with automated analysis procedure, Bettersizer ST provides stable and reliable testing results with minimum user intervention. The compact footprint saves valuable work space for factories and laboratories.

Features and Benefits:

- Measuring range:
  Particle size from 0.1μm to 1000μm.

- Dual Lenses Optical System (DLOS) provides accurate test result on particle size.

- Standard Operation Procedure (SOP) offers easy operation.

- Compact design saves work space.

- Automatic alignment and automatic testing lead to good repeatability with relative standard deviation (%RSD) of less than 1%.

- User-friendly software offers the best test experience.

MODULAR DESIGN FOR
DRY AND WET DISPERSIONS

Bettersizer SD is a powerful laser particle size analyzer providing accurate particle size distributions with both wet and dry dispersion methods. The dry dispersing system uses an electromagnetic vibration feeder, Venturi airflow dispersion, air curtain shielding preventing the lens from sample contamination. Brittle dry powder and cohesive dry powder can be totally dispersed.
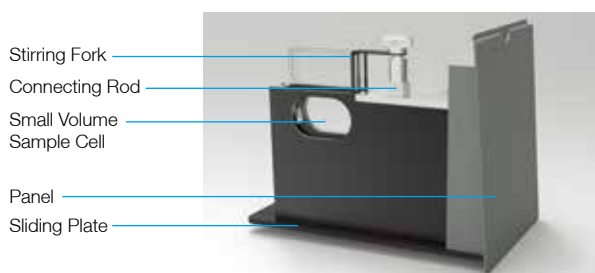
Features and Benefits:

- **Measuring range:**
  Particle size from 0.1μm to 1000μm.

- Sampling system: easy to convert between dry system and wet system.

- SOP and automatic alignment provide an easy and convenient operation experience.

- Powerful software, data security assurance, custom format output reports and compensates for stray light.

Bettersizer S:

ECONOMICAL PARTICLE SIZE ANALYZER (MODULAR MODEL)

Bettersizer S is a basic particle size analyzer with separated dispersing module and optical bench. The design has the advantage of easy maintenance. The metal casing of Bettersizer S provides protection for EMI (electromagnetic interference), makes it suitable for laboratories in a manufacturing environment, quality control of raw materials in process and finished products.

Stirring Fork
Connecting Rod
Small Volume Sample Cell
Panel
Sliding Plate

Small Volume Sampler

Features and Benefits:

- **Measuring range:** Particle size from 0.1µm to 716µm.
- DLOS and two sets of photodetector array in the forward and backward position of the lens.
- Automatic alignment.
- SOP software.
- Sampling system: Two types of automatic circulation and dispersing modules to testing samples dispersed in aqueous and organic solvents.
- Optional small volume cell module for analyzing small quantity of sample, dispersed in organic solvents.

Nanoptic 90:

HIGH SENSITIVITY NANO-PARTICLE ANALYZER

Nanoptic 90 is a nano-particle analyzer based on dynamic light scattering technology for analyzing nano sized materials. Nanoptic 90 can measure sizes down to 1nm. The high-power laser light source and high sensitivity PMT provide rapid and accurate testing results.

Features and Benefits:

- **Measuring range:** Particle size from 1nm to 9500nm
- Less than 5 minutes per test.
- A small quantity of sample required - 5ml and 1ml sample cell volume available.
- High-precision temperature control system provides accuracy of ±0.5°C.
- Intuitive software interface.

DYNAMIC IMAGE ANALYZER
FOR DRY AND WET ANALYSIS

BeVision D1 is a microscopic image particle size and shape analysis system. The dry dispersion aims at coarser and even millimeter range powder materials. The wet dispersion applies to micron range powder materials. High-speed CCD and multi-threading software of BeVision D1 allow quick identification of particles and obtain stable and accurate measuring results.

Features and Benefits:

- **Measuring range:**
  Wet dispersion: 4μm to 3500μm
  Dry dispersion: 30μm to 10000μm.

- Intelligent software can **identify 10000 particles per minute**. Automatic recognition of agglomerated powder to achieve accurate results.

- **Analysis:** particle size distribution, maximum particle size, content for a specific interval, aspect ratio, circularity and radius-thickness ratio.

- **High-speed camera** - 120 images per second, microsecond exposure time, avoid trailing phenomenon in moving particle.

- **Sampler:** the dry sampler uses electromagnetic vibration feeding, gravity-driven dispersion, which is suitable for coarse samples and agglomerated particles; the wet sampler uses an external circulating dispersion system with ultrasonic dispersion and centrifugal circulation.

AUTOMATIC DYNAMIC IMAGE ANALYZER

BeVision W1 is a high-resolution dynamic image particle size and shape analysis system. By using sheath flow technology, BeVision W1 can capture each individual particle and deliver accurate and reliable particle images. BeVision W1 is the best solution for scientific research and quality control as well, when particle size and shape analysis is required.

Features and Benefits:

- **Measuring range:** 4µm to 400µm.

- **Analysis:** particle size distribution, maximum particle size, content for a specific interval, aspect ratio, circularity and radius-thickness ratio.

- **Sheath flow technology** ensures that each individual particle passes through the focal plane of the cell sequentially, eliminates particle overlapping and defocus issues.

- Intelligent software can identify 10000 particles per minute. Automatic recognition of agglomerated powder further improve the accuracy of analysis.

BeVision M1:

CLEANLINESS ANALYSIS EXPERT

BeVision M1 is an automatic image scanning system for filter paper cleanliness analysis. Equipped with a metallurgical microscope, programmable motorized stage, autofocus function, and high-resolution CCD, BeVision M1 can capture and recognize each individual particle, automatically stitching the images to a large panoramic image.

Features and Benefits:

- **Measuring range:**
  Particle size and shape from 1μm to 5000μm.

- **Panoramic image:** systematically stepping and scanning of a defined region, capturing an image at every stepping interval. The software will seamlessly stitch the captured images into one high-resolution panoramic image.

- **Particle size and shape analysis:** particle size distribution, maximum particle size, content for a specific interval, aspect ratio, circularity and radius-thickness ratio.

BeVision S1:

CLASSIC IMAGE ANALYZER FOR PARTICLE SIZE AND SHAPE

BeVision S1 employs the latest software particle image processing technology for the traditional microscope imaging method, providing intuitive and accurate particle size distribution. BeVision S1 is used widely in particle shape observation and analysis, such as grinding abrasives, super-hard materials, spherical materials and metal powder abrasives.

Features and Benefits:

- **Measuring range:**
  Particle size and shape from 1μm to 3000μm.

- **Image processing:** in order to increase the statistical representation of the sample, collections of multiple images can be analyzed together to provide a true representation of the particle distribution of the sample.

- **The accuracy of particle size analysis:** calibration of the pixel size can be performed using the standard stage micrometer.

- **Particle size and shape analysis:** particle size distribution, maximum particle size, content for a specific interval, aspect ratio, circularity and radius-thickness ratio.

AUTOMATIC ANALYSIS
OF POWDER CHARACTERISTICS

PowderPro A1 is a smart powder characteristics tester to measure repose angle, collapse angle and other powder characteristics. It uses image technology and automatic control including touch screen control and a mobile App connectivity. PowderPro A1 is an essential tool to understand and research powder materials.

Features and Benefits:

- **Automatic measurement:** images are captured with CCD and are processed to obtain the angle of response, collapse angle, flat plate angle and other parameters.

- Patented rotary vibration technology to ensure smooth surface of the powder and to improve measurement accuracy.

- **Multiple control units meet different needs:** users can control the instrument with a touch screen, computer or through the mobile phone application.

- **Measured parameters:** angle of response, angle of collapse, flat plate angle, sliding angle, tap density, the dispersion degree of bulk density, sieve size.

- **Calculated parameters:** angle of difference, compressibility, voidage, flowability index, jet index.

MANUAL POWDER CHARACTERISTIC ANALYSIS

PowderPro M1 is the manual version of the automatic PowderPro A1. It can perform the same analysis of PowderPro A1 through a manual process. PowderPro M1 is a good choice for small laboratories and academia.

Specifications of test Standards:

1. Test methods for angle of repose, non-metallic bulk density, tap density, the degree of compression according to GB / T 16913-2008-4.5 method.

2. Metal powder and non-metallic powder's tap density according to GB / T 5162-2006 / ISO3953: 1993

3. Degree of dispersion, flat angle, uniformity ratio and degree of agglutination are essential to calculating the Carl fluidity index according to US standards ASTMD6393-08

4. Test for tap density meet standards 07/2010: 20934E of the European Pharmacopoeia EP7.0 and USP 616.

Measure angle of repose

Tap density
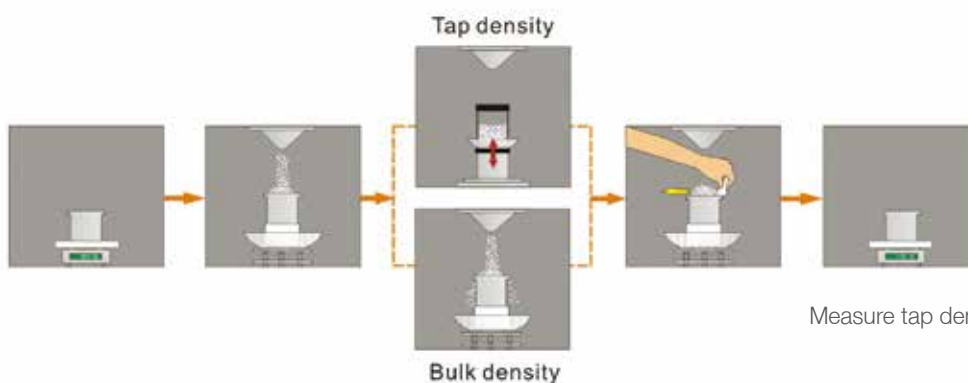
Bulk density

Measure tap density and bulk density

BeDensi T series / BeDensi B1-S / BeDensi B1 / HFlow-1

BEDENSI T SERIES TAP DENSITOMETER

BeDensi T series includes BeDensi T1 (one cylinder), BeDensi T2 (two cylinders) and BeDensi T3 (three cylinders). The densitometers equipped with multiple cylinders to measure powder samples simultaneously. BeDensi T series meets international standard ISO3953: 1993 and is in accordance to provisions of the United States Pharmacopeia for drug tap density testing.

BEDENSI B1-S BULK DENSITY METER (FOR METAL POWDERS)

BeDensi B1-S bulk density meter uses Scott capacity meter method to measure bulk density of various metal powder. Manufacturing standard of BeDensi B1-S meets GB / T5060-1985 (ISO 3923/2).

BEDENSI B1 BULK DENSITY METER (EXCEPT FOR METAL POWDER)

BeDensi B1 bulk density meter adopts natural deposition method. Its manufacturing standard meets GB / T16913.3-1997- Part III: Determination of bulk density.

HFLOW-1
METAL POWDER FLOWABILITY TESTER

HFlow-1 tests the flowability of metal powder by measuring whether the sample can flow through the 2.5mm standard funnel.

The design and production of HFlow-1 Hall-flow meter is based on standards GB / T1482-2010 and ISO4490-2008.

BeDensi T1

Technical Service and Support

We strive to make all customer contact with Bettersize a positive experience, whether the customer issue is one of service, innovation or product quality. Our goal is to improve your productivity through comprehensive and professional support, service, and information. Our commitment is to guarantee the lifecycle accuracy and reliability of our products.

We provide:

- Well-trained service team
- World-wide collaboration with local distributors
- Technical supports from Bettersize by telephone or email
- Professional maintenance contract and repair services
- On-site training courses
- Online tutorial videos
- Instrument upgrade support
- Sample preparation and application consulting services

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