

# Big Vision for Small Particles

## PARTICLE SHAPE





# BeVision S1

## Big Vision for Small Particles

The BeVision S1 offers an easy solution to measure and analyze the size and shape of particles in a range of 0.3-4,500 µm. It is easy to use while staying reliable and accurate.

The BeVision software offers 34 different particle size and shape parameters and further organizes the data into an all-around validation of particles.

The BeVision S1 is not only a reliable independent particle size and shape analyzer, but it can also be a perfect match for laser diffraction particle analyzers, as an aid or a verification.

With high magnification up to **4,000** times\*  
*\*Includes digital magnification*

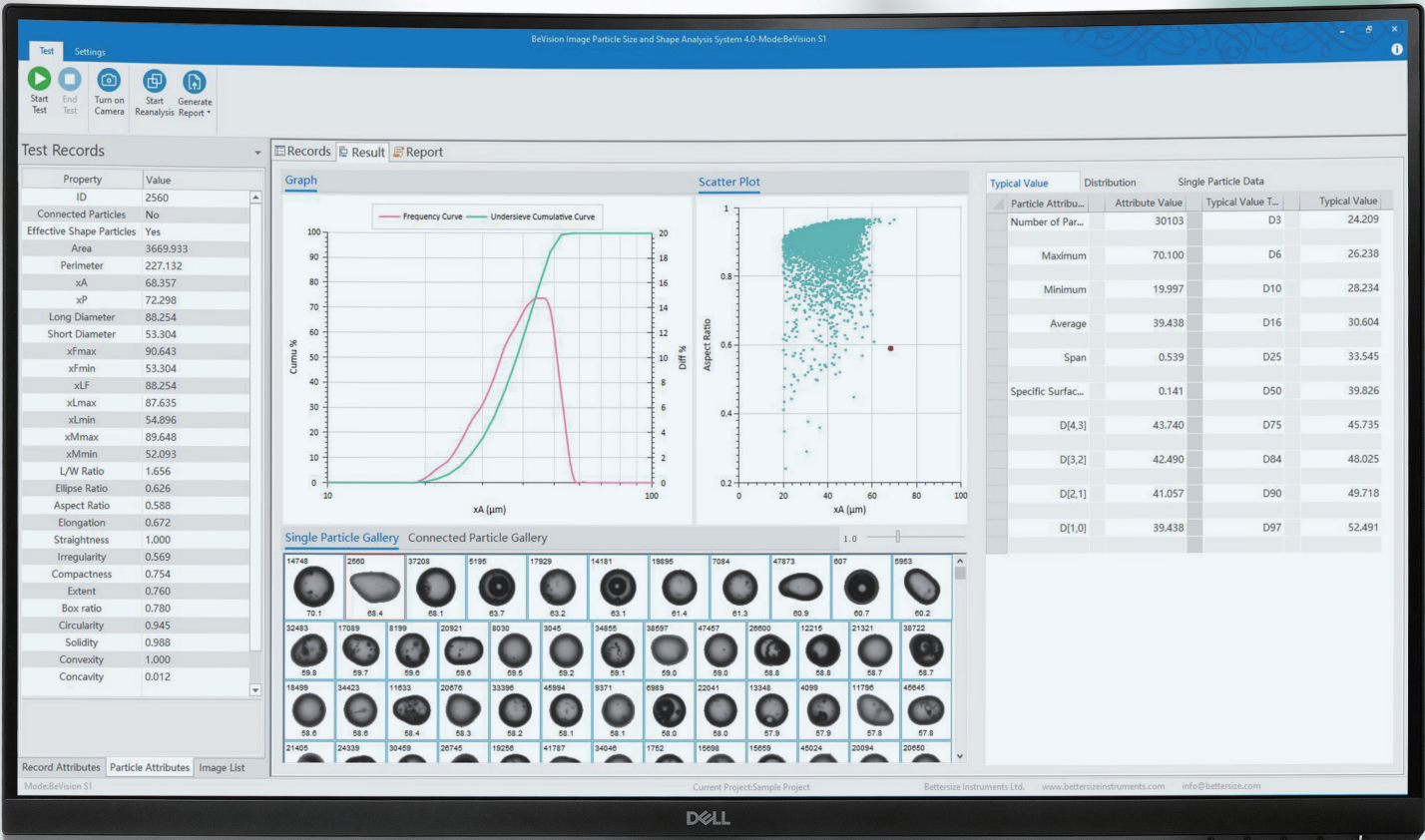
A **high - resolution** CMOS camera

Particles as fine as **0.3 micron**  
can be captured and analyzed



### Features and Benefits

- Measurement range: **0.3 - 4,500 µm**
- **34** different particle size and shape parameters
- **Optional** models for different applications
- Both **dry and wet** measurements
- Results in compliance with **ISO 9276 - 6**
- A **budget - friendly** solution for your particle analysis
- **Powerful software** eases your work
- **Customizable** reports for different evaluation options





# Why Image Analysis Method?

## Easy

Capture an image of particles, identify particles, then measure their size and shape. Every step of image analysis is easy and clear.

## Shape analysis

Based on a direct view of particles, it is possible to analyze not only the size of particles, but also their shape.

## Seeing is believing

The image analysis method determines the size and shape of every individual particle and then sums it up to form a statistic. Details of particle size or shape distribution can be accurately provided.

# Why Static Image Analysis Method?

## Clear vision

In static image analyzers, precision microscopes and high-resolution cameras are specialized for high - quality particle images.

## Undersized particle sensitivity

The static image analysis method is sensitive to undersized particles; it is even possible to estimate the size of undersized particles.

## Small sample volume

The static image analysis method requires a small volume of samples. A few drops of emulsions or a few micrograms of powders are enough to do a measurement.

# BeVision Series: Precision in Particle Vision



### BeVision S1

Classical and versatile static image analyzer for wet and dry measurements.



### BeVision M1

Automated static image analyzer.



### BeVision D2

Dynamic image analyzer for dry powders and granules.

	Static Image Analysis		Dynamic Image Analysis
	BeVision S1	BeVision M1	BeVision D2
Measurement range	0.3 - 4,500 µm	0.3 - 10,000 µm	3.5 - 13,000 µm
Particle shape analysis	● ● ●	● ● ●	● ● ●
High-resolution for narrow distributions	● ● ●	● ● ●	● ● ●
Accuracy for broad distributions	●	● ●	● ● ●
Reproducibility	●	● ●	● ● ●
Small sample volume for a single analysis	● ● ●	● ●	●
Undersized particles detection	● ● ●	● ●	●
Oversized particles detection	●	●	● ● ●
Simple operation and measurement efficiency	● ●	● ● ●	● ● ●
Individual particle analysis	● ● ●	● ● ●	● ●



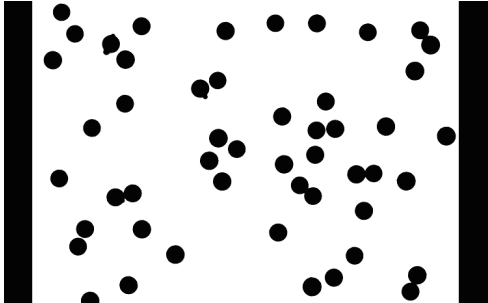
# BeVision S1 Optional Models

## Transmitted light illumination (Standard model)



Equipped with a transmitted light source, the BeVision S1 can observe and analyze particles effectively for most applications. The standard model BeVision S1 is widely used in different industries, e.g., chemicals, minerals, ceramics, and polishing agents.

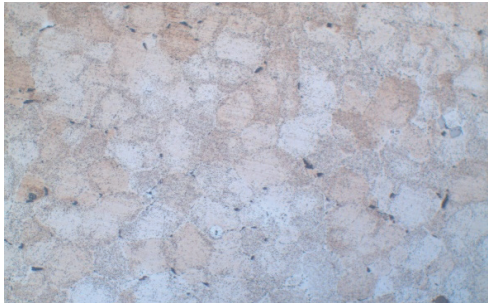
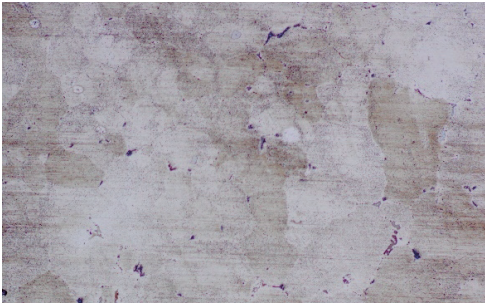
2777	24566	16702	23950	18014
56.2	56.1	56.1	56.1	56.1
44025	42354	39993	17323	37584
55.9	55.8	55.8	55.8	55.8
738	1011	4735	33186	48275
55.6	55.6	55.6	55.6	55.6



## Reflected light illumination



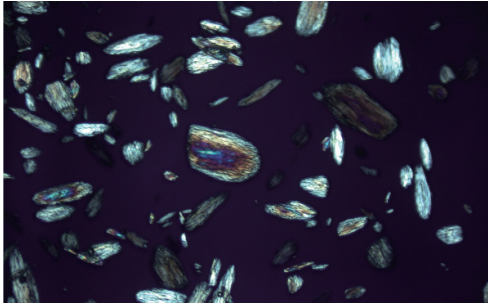
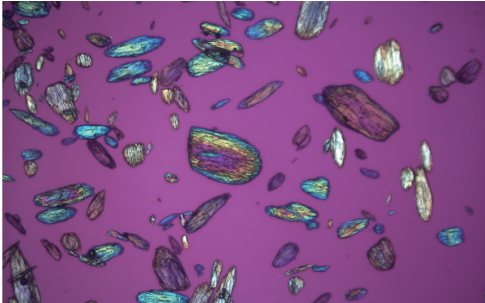
The optional reflected light source of the BeVision S1 can help measure particles dispersed in opaque mediums or on opaque surfaces, e.g., particles on filter paper or filter film, and metal powders embedded in metallographic samples.



## Polarized light illumination



Equipped with polarizing plates, the BeVision S1 provides users with particle size and particle shape analysis under polarized light. The polarized light model BeVision S1 is trusted by researchers and engineers in the field of biology, pharmacy, medicine, geology, mining, etc.



# Particle Size and Shape Parameters

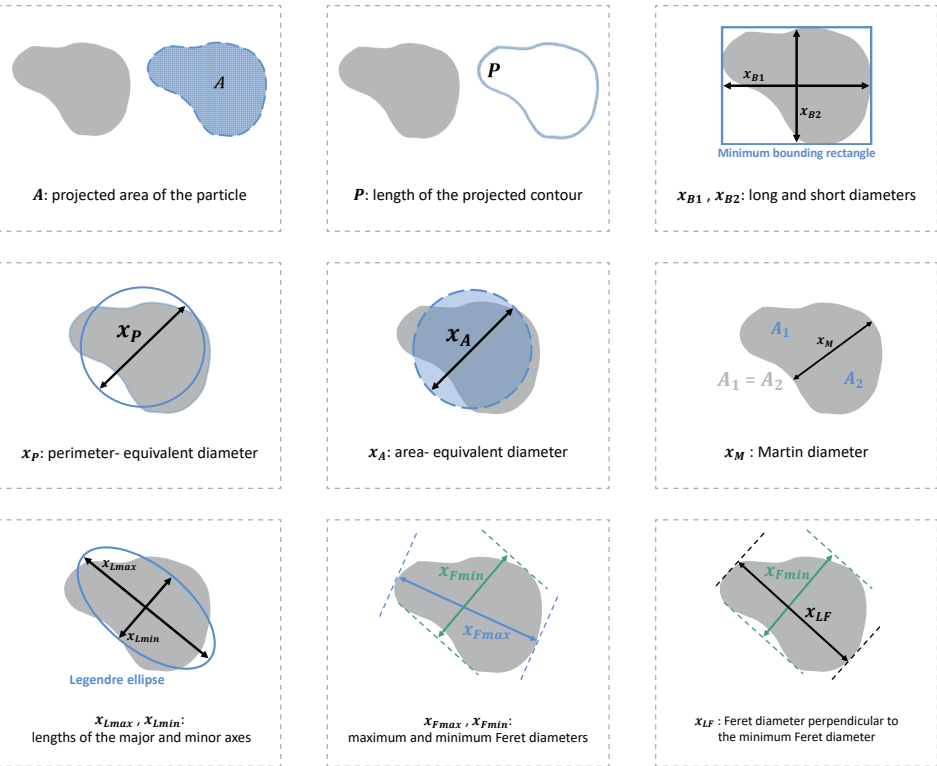
## Size parameters

**Equivalent diameters:**  
area-equivalent diameter  
perimeter-equivalent diameter

**Feret diameters:**  
maximum and minimum Feret diameters,  $x_{LF}$  ("length")

**Martin diameters:**  
maximum and minimum Martin diameters

**Legendre ellipse:**  
major and minor axes



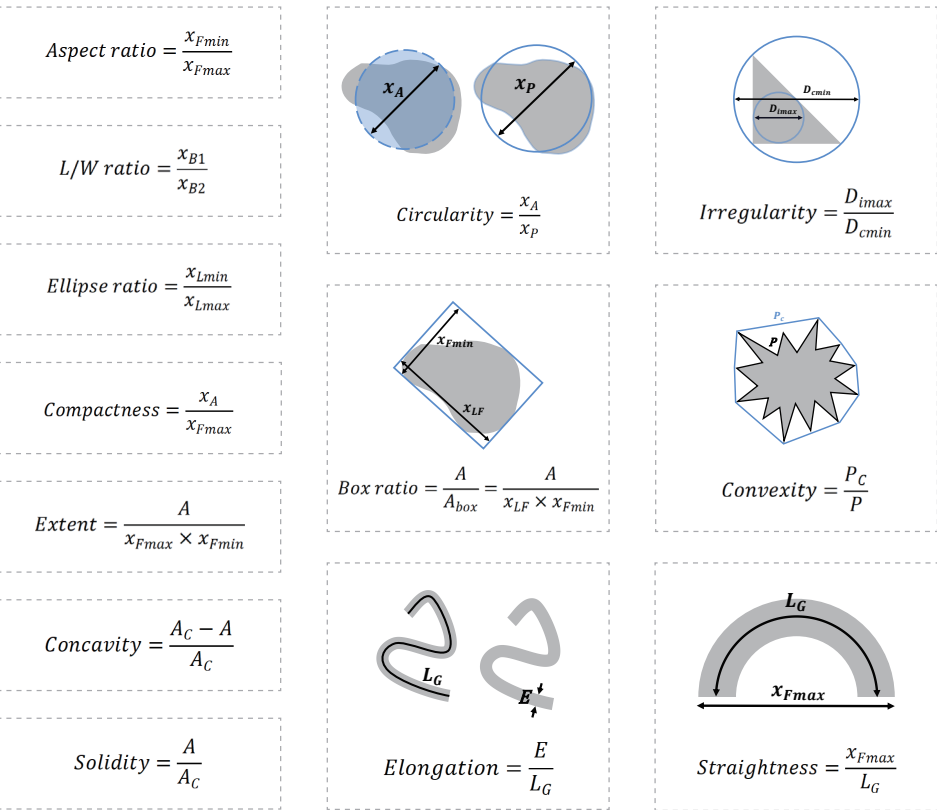
## Shape parameters

**Size difference in 2 directions:**  
aspect ratio  
L/W ratio  
ellipse ratio

**Round-likeness and rectangle-likeness:**  
circularity (11 optional algorithms)  
compactness  
extent  
box ratio

**Contour concavity:**  
concavity  
convexity  
solidity

**For elongated particles:**  
elongation  
straightness





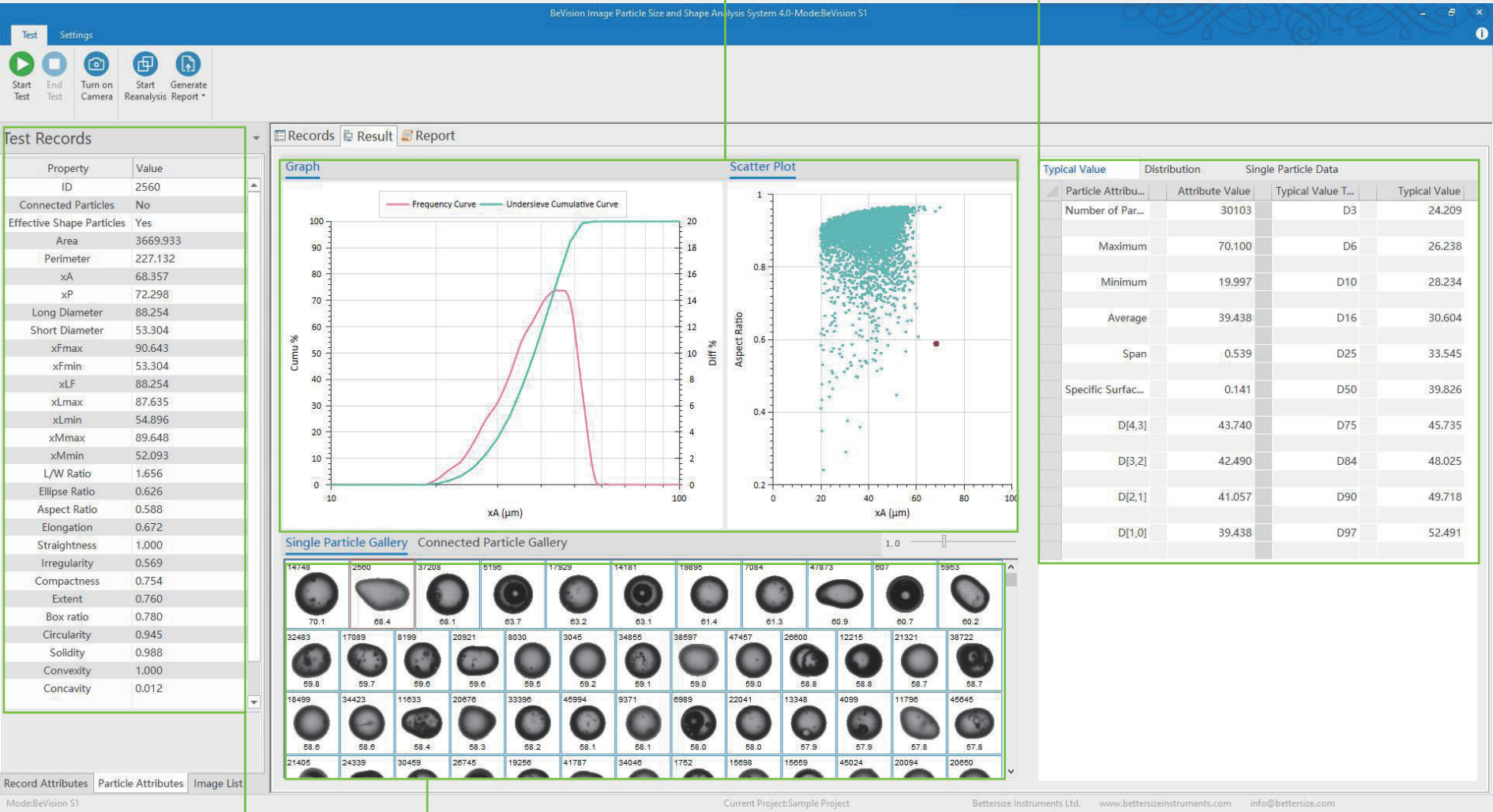
# BeVision Software: Visualized Insights for You

## Distribution in total

Distribution curves and charts present particle size and shape distributions, and the scattering plot shows the relationship between two different particle size and shape parameters. All these charts, curves, and tables are customizable.

## Distribution in summary

The BeVision software offers statistics and typical values to describe particle size and shape distributions, e.g., the D[1,0], span value, and D90. And the typical value chart is customizable.



## Particle details

For irregularly shaped particles, it is hard to describe their size with a single dimension. Scanning over 180 different directions of each particle projection, the BeVision software is able to precisely analyze particles, and present the particle size and shape in 24 different parameters. The size and shape parameters are in compliance with ISO 9276 - 6.

## Locate particles

The BeVision software offers a single particle gallery that can be the direct way to locate particles with a specific appearance. Besides, the BeVision software allows users to find particles with specific characteristics, with a customizable filter.

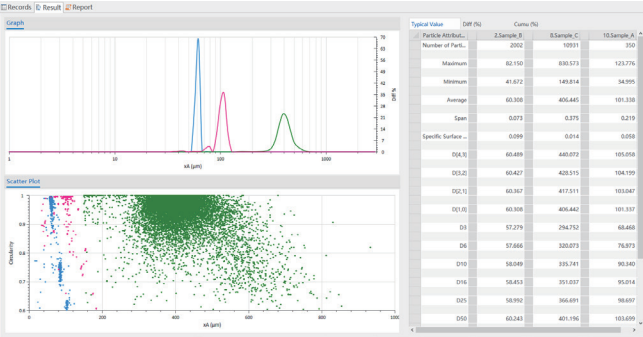
## Reproducible measurements

To ensure a reproducible result, the BeVision software can make a measurement automatically, following a saved standard operation procedure (SOP).



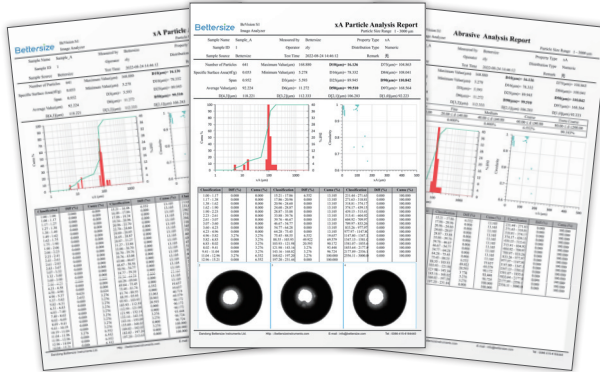
## Comparable results

With the help of the BeVision software, it is possible to do a comparison among multiple records: particle size or shape distribution comparison, typical value comparison, etc.



## Customizable reports

The BeVision series prepares various report templates for different evaluation options. Layouts and contents of report templates are editable and customizable.

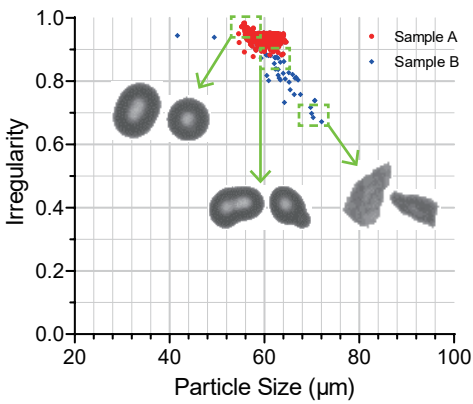




# Application Cases

## Glass beads

Glass beads are widely used in construction, traffic paint, sandblasting, etc. In this case, both size and shape of glass beads affect their griding effect. The BeVision S1 offers size and shape measurement results at the same time, helping the QC engineers achieve an insightful validation of glass beads products. A scatter plot showing the relationship between particle size and irregularity helps compare the shape distribution and the irregular particle concentration of samples A and B, and evaluates their quality.



## Starch granules of *Treculia africana*

Just like other micro particles in the field of biology research, starch granules from different botanical sources present characteristic shapes, sizes, and morphologies. Accordingly, the BeVision S1 offers a flexible way to count the total number of particles and to analyze the size and shape of them automatically. For example, a BeVision S1 helps researchers from the University of Ibadan and Glyndwr University to analyze the size and shape of seed starch granules of *Treculia africana* and develop more insights into the starch manufacturing.

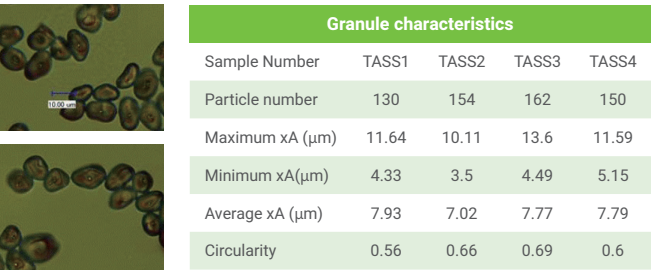
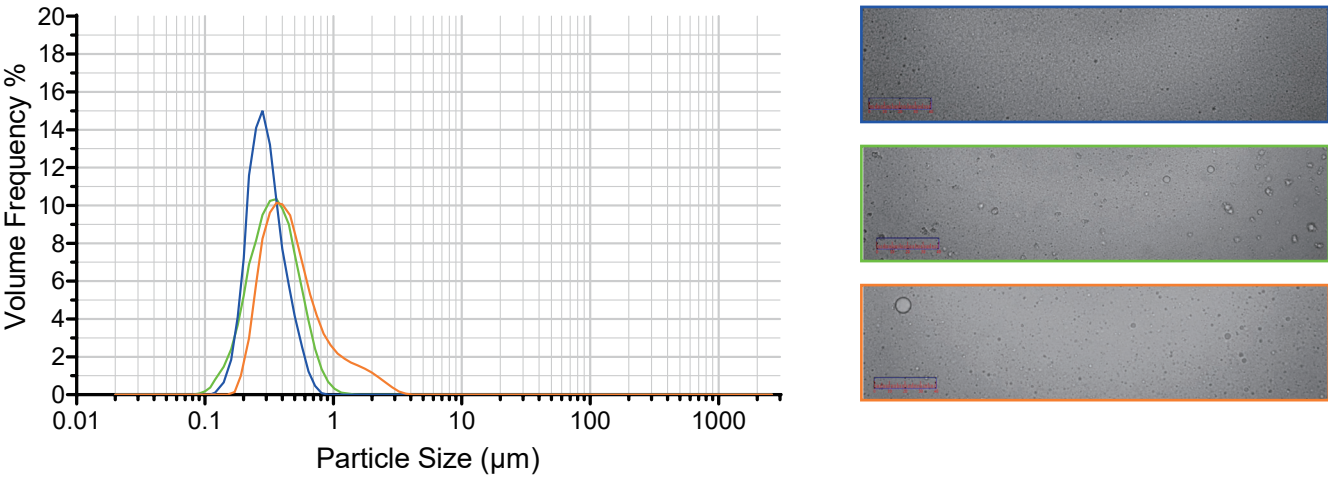


Image and size distribution of *Treculia africana* starch granules. Adopted from Nwokocho, L. M., Williams, P. A., Structure and properties of *Treculia africana*, (Decne) seed starch, *Carbohydrate Polymers*, 2009, (84), 395-401

## Pharmaceutical lipid emulsions

Images provided by the BeVision S1 are persuasive support for the particle size distribution results of other sizing methods. Here, the particle size distribution curves from the Bettersizer 2600 show the trend of the particle size distribution of lipid emulsions after multiple homogenization processes. The BeVision S1 is a convincing tool when evaluating particle size results, and also a handy tool to ensure product quality.



# Typical Applications

Agriculture



Abrasives



Paints, Inks & Coatings



Metal Powders



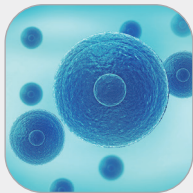
Pharmaceuticals



Mining and Minerals



Biology and Microorganisms



Ceramics



# BT - 910 Helps to Prepare Dry Powders



## How does it help?

The BT- 910 powder disperser generates a pre -set air pressure difference, which drives the dispersion airflow. The BT- 910 aims to offer a reliable and reproducible dispersion method for dry powders.

## Features and Benefits

- Reproducible dispersion
- No aggregates
- Even Dispersion



## General

Measuring principle	Static image analysis method
Parameters	Particle size, shape, and number

## Measurement performance

Measuring range	Biomicroscopy: 0.3 – 4,500 µm Metallographic microscopy (optional): 0.1 – 2700 µm
Typical measurement time	3 to 5 min *
Number of size/shape classes	100 (user adjustable)
Special functions	SOP settings, analysis of saved images

## Main device

Optical lens	Biomicroscopy: a built-in 0.55x, 2x, 4x, 10x, 40x, 100x (with 40 × digital magnification) Metallographic microscopy: 2x, 5x, 10xBD, 20xBD, 50x, 100x (with 40 × digital magnification)
Camera	CMOS, 12Mpix
Light source	Biomicroscopy: transmitted LED light Metallographic: transmitted light and reflective light (Halogen lamp)

## System parameters

Dimensions (L × W × H)	7.87 × 16.54 × 21.65 in
Weight	17.64 lb
Supply voltage	100 / 240 V, 50 / 60 Hz

## Software

Conformity	ISO 13321, ISO 9276
Reports	Customizable reporting

\* Sample and sample preparation dependent

## BT - 910 powder disperser

Dimensions (L × W × H)	9.25 × 6.5 × 10.47 in
Weight	9.48 lb
Supply voltage	100 / 240 V, 50 / 60 Hz
Dispersion air pressure	≤ - 60 kPa

**Bettersize**  
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Qi srl  
t +39 06 9105461  
www.qitech.it | SalesQi@qitech.it

### Bettersize Inc.

#### Regional Office East

106 Apple St, Ste 300, Tinton Falls,  
NJ 07724, United States

#### Regional Office West

Suite K-2, 3188 Airway Ave, Costa Mesa,  
CA 92626, United States

**Tel:** +1 833-699-7493 (SIZE)

**Email:** support.us@bettersize.com

[www.bettersizeinstruments.com](http://www.bettersizeinstruments.com)



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