

HORIBA

LASER DIFFRACTION AND DYNAMIC IMAGING PARTICLE SIZE AND SHAPE ANALYZER



partica 



A newly engineered particle characterization platform combining laser diffraction theory with sophisticated dynamic imaging analysis achieves superior, multi-modal particle measurement capabilities.



Material science presents increasingly complex challenges across research, development, and manufacturing. Each stage demands different analytical approaches and continuous problem-solving. To support these evolving needs, we offer a comprehensive solution built on multi-aspect particle characterization technologies developed through advanced engineering expertise.

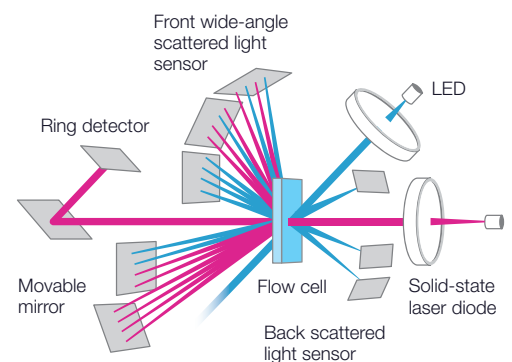
Partica integrates the laser diffraction principle for particle size and distribution analysis with dynamic image-capturing technology, using a simultaneous sampling method. This powerful combination delivers exceptional analytical transparency and significantly improves laboratory productivity.

The system accommodates a diverse range of materials—including wet dispersions, dry powders, and high-concentration suspensions—through a selection of specialized accessories. By providing dual-aspect data on particle size, distribution, and shape across a broad dynamic range, Partica transforms everyday laboratory and QC workflows, enabling more confident decisions and supporting the most cutting-edge results.

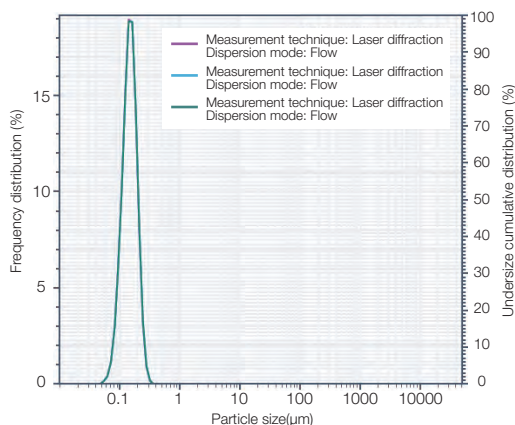
Laser Diffraction Analysis

Dual-wavelength light-source integration delivers strong performance across a wide dynamic measurement range.

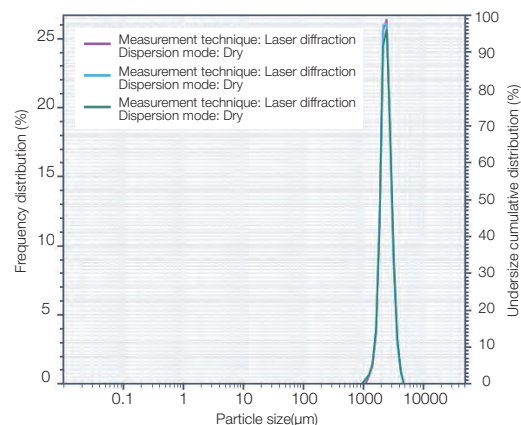
- Multi-angle light-scattering detection sensitively captures essential fine-particle information throughout testing.
- Automatic optical alignment ensures optimal performance and repeatability for every measurement.
- NIST-traceable calibration maintains high accuracy within 0.6% of certified reference values.
- ISO 13320-compliant, ensures reliable D10, D50, and D90 particle-size results.



Small particle – Silicone emulsion



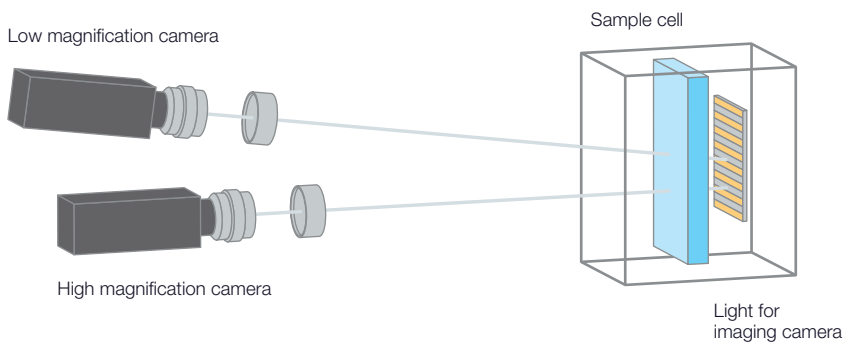
Large particle – Animal food



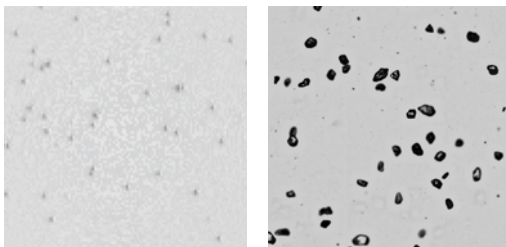
Dynamic Imaging Analysis

Superior shape detection powered by a fully integrated dual-camera system.

- Dual cameras with different magnifications deliver a wider, more reliable particle-shape and size analysis range.
- User-friendly software with an intuitive GUI streamlines data processing and enhances workflow efficiency.
- Over 30 standardized particle-shape parameter formulas enable comprehensive, flexible morphological evaluation.
- Both cameras are compatible with a variety of optional sampling cells, ensuring broad application versatility.



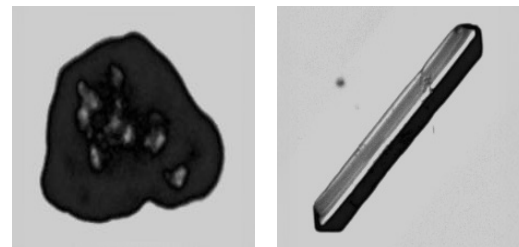
Wide size range dynamic particle image analysis from microns to millimeters



High magnification camera
(1 μm particle)

Low magnification camera
(100 μm particle)

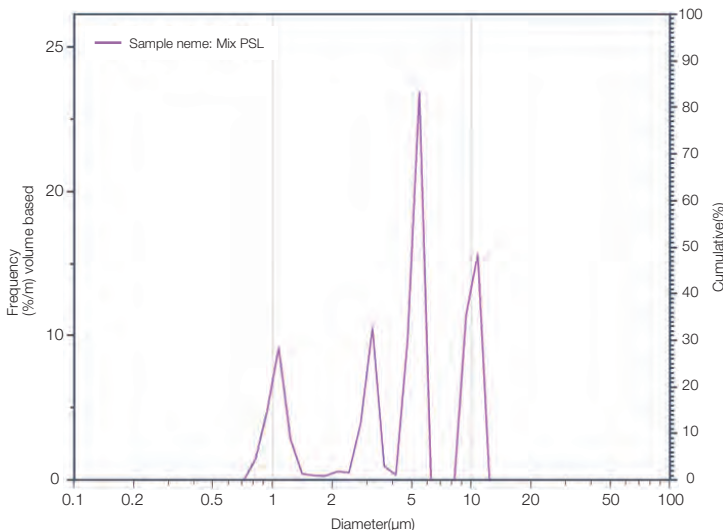
Dynamic particle image analysis of diverse particle shapes



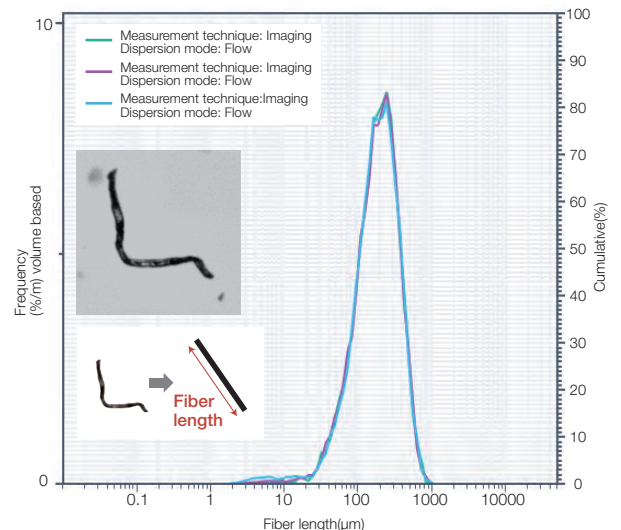
Coarse particles

Elongated sample

Particle sizing with high resolution analysis capability – Mixed different size particle Standards



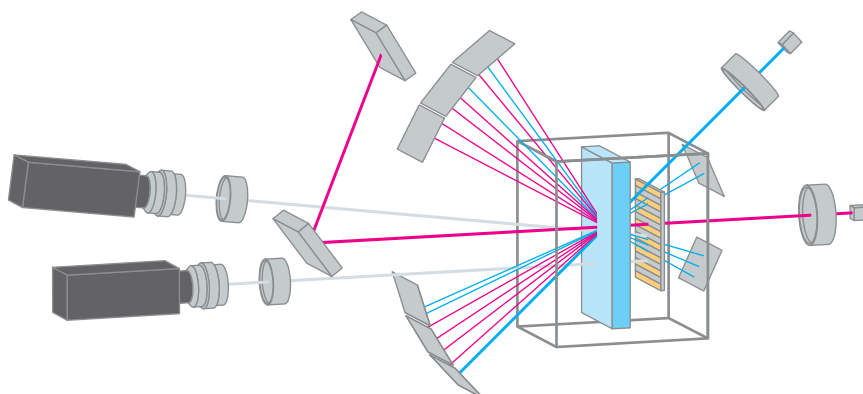
Imaging detects complexed particle shape information – Cellulose fiber sample



A single sampling action delivers multiple analyses, providing sophisticated and comprehensive evidence.



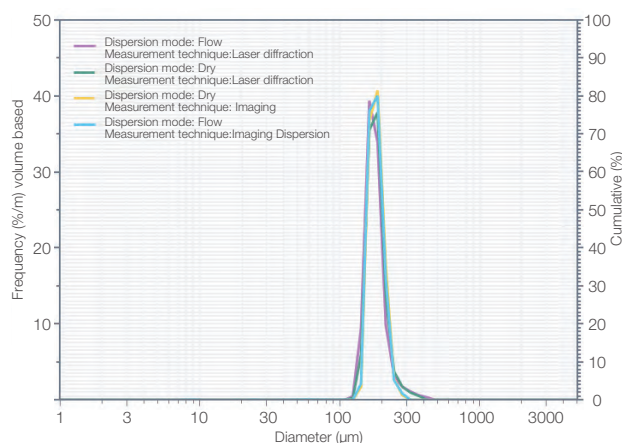
- Simultaneous dual-mode analysis combines laser diffraction measurement with particle imaging, delivering complementary data in a single test.
- Flexible data outputs allow you to select the particle characteristics most relevant to your analytical purpose—whether size, distribution, shape, or combined insights.
- A wide range of optional sampling cells supports diverse sample types and applications, ensuring exceptional versatility across different workflows.



Accuracy & Actionable Insights

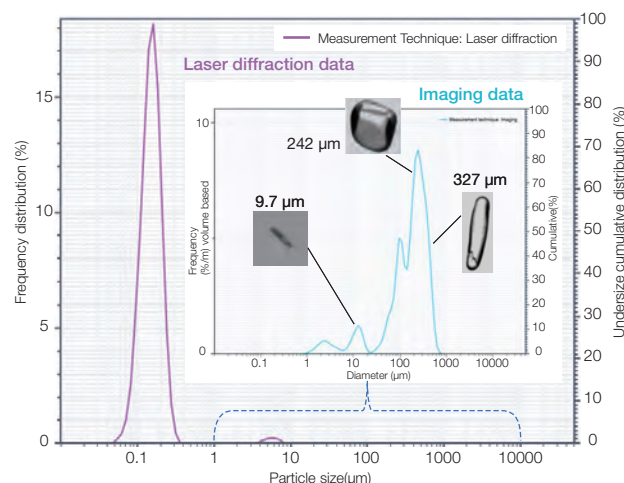
Glass beads testing

Particle size and distribution analysis using various sampling methods provides reliable, robust information for material quality evaluation. This example applies laser diffraction and imaging unified analysis to a standard glass bead sample. Data from both liquid-dispersed (wet) and dry powder analyses, overlaid on the graph, are synchronized. The particles are spherical and remain identical in both dispersing conditions, supporting this consistency.



Silica slurry quality analysis

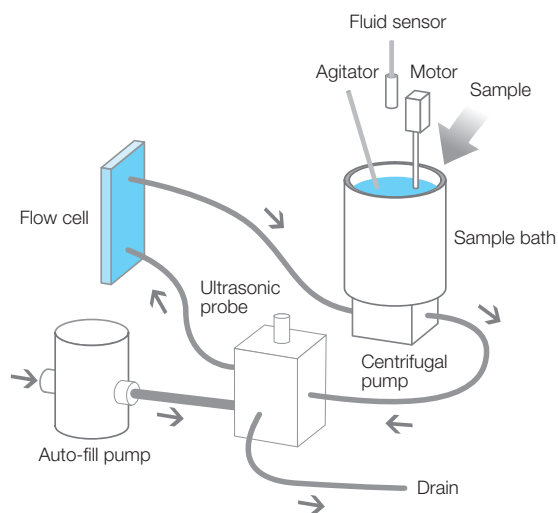
Particle size and distribution analysis are enhanced by using multiple technologies, delivering a more powerful overview of the material testing. Here is an example of static light scattering (SLS) data complemented by imaging technology — while SLS detects large particles, dynamic imaging provides greater resolution and reveals more detailed particle properties. This silica slurry analysis, comparing both technologies, reveals very few large contaminants or agglomerated particles while providing detailed characterization data that can help identify and resolve potential issues during the manufacturing quality control process.



Wet Sampling System designed for consistent and reproducible operation

Sampling, analysis, and displaying the result takes less than 60 seconds.

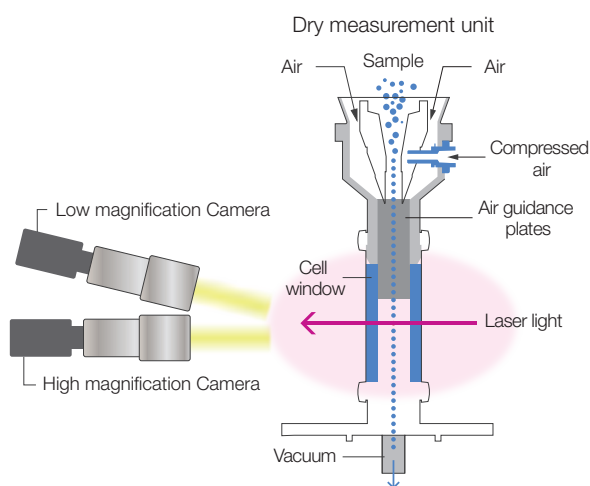
- The Partica circulation pumping system works effectively for a diverse range of particle sizes, their size distributions, densities, and properties with dispersant in use.
- Required dispersing liquid volume for each sampling is about 150 mL, is applicable to water-based solutions, as well as organic solvents. The Partica series supports wet mode sample dispersing and features a sample circulation system designed for a wide range of analyses. It enables fast, reliable sample preparation with automated filling of dispersing, rinsing liquids, and efficient dispersion of agglomerated particles using the built-in ultrasonic probe.
- Sample contamination may occur due to inadequate analysis operations. Partica incorporates an automatic liquid feeding system, which enables complete washing out of remaining samples in the sampling bath. This also helps minimize the total amount of rinsing liquid.
- Sampling concentration automatic adjustment can be supported by auto-dilution software features. This +/-1%* precise control helps reduce sampling condition variances.
(*Depending on the properties of the material for analysis and concentrations)



Dry Powder Particle Analysis

Partica Powderjet Dry Powder Feeder (Optional Accessory)

Powder material characterization is an essential parameter for controlling the final product performance and ensuring consistent quality. This powderjet dry powder feeder ensures as-is measurement as well as dispersing compressed air, thereby forcing condition analysis, and applying to individual sample properties. The built-in cameras capture particle morphological information, while the laser diffraction principle is used for measurement.



Available chutes

Standard chute

Included with every Powderjet Dry Feeder applicable to general powder materials.



Coated chute

This coated chute is useful for samples which adhere to the stainless steel standard chute.



V-type chute

This chute is ideal for both small amounts of powder and powder which does not flow easily, e.g. magnetic powders.



Vacuum sampler

This accessory is designed for measuring the limited amount of powder samples. The suction nozzle and sampling plate are all inclusive.



Unique sampling accessories for various applications

Sampling accessories for small volume liquids and organic solvents

► Fraction Cell

The Fraction Cell can take measurements with samples as small as only 5 mL.

- Minimize the amount of dispersant.
- The Fraction Cell is ideal when the sample is extremely small or you need to recover the entire sample.

Measurement range:

0.01-1000 μm , suits organic solvents

Cell volumes:

5 mL, 10 mL, 15 mL

- Rare sample
- Measurements with highly volatile solvent



► MiniFlow (Circulation system)

Small-volume circulation with organic solvents.

- Measurement needs as small as 35 mL of solvent (180 mL with conventional circulation systems).
- Built-in ultrasonic probe for sample dispersion.



High concentration sampling cell accessories

► High Concentration Cell*

The High Concentration Cell is able to measure close to original concentration with low dilution or without dilution.

- Key applications are inks, paints, pigments, and emulsion materials, as well as secondary battery electrodes.
- High concentration particle sampling helps different dispersion state and stability testing.



► Paste Cell*

The Paste Cell can measure undiluted samples or samples dispersed in a viscous medium.

- Microparticles dispersed in high-viscosity samples or polymers.
- Magnetic powder: Measure magnetic powder by dispersing it in viscous oil to prevent re-agglomeration.



*These optional accessories are available for laser diffraction analysis.

Application Example: Advanced functional material development and quality control



Designed for easy sampling cell change and maintenance design

- Analyze one sample 2 different techniques: static light scattering particle sizing and dynamic particle image analysis.
- Simple cell stage change for each different sampling cell.
- Automated sample dispersing bath and circulation system cleaning available for each analysis minimizes sample contamination risks.
- Automatic sampling concentration adjustment feature enables repeatable and consistent testing operations.



Intuitive operation software features

- The intuitive, user-friendly software improves analysis efficiency.
- Static light scattering particle size analysis conducts both wet and dry sampling conditions, and the software provides simple and effortless settings with measurements with the most feasible conditions.
- HORIBA PLATINALINK software platform for data integrity involves technologies and processes ensuring data accuracy, consistency, and reliability across its life cycle.

Measurement screen

Data analysis display

Data integrity supporting features

HORIBA PLATINALINK

Reliable instrument performance assurance and compliance support

- Embedded software with key features that ensure compliance with FDA 21 CFR Part 11 for electronic records and signatures, for pharmaceutical, medical device, and biotech laboratories and industries.
- Built to the international standards - ISO 13320 (2020) Particle size analysis - Laser diffraction methods, and ISO 13322-2 (2021) Particle size analysis - Image analysis methods. Each production guarantees with $\pm 0.6\%$ sizing accuracy for laser diffraction method on every unit, verified against NIST-traceable particle standards.

Partica Specifications

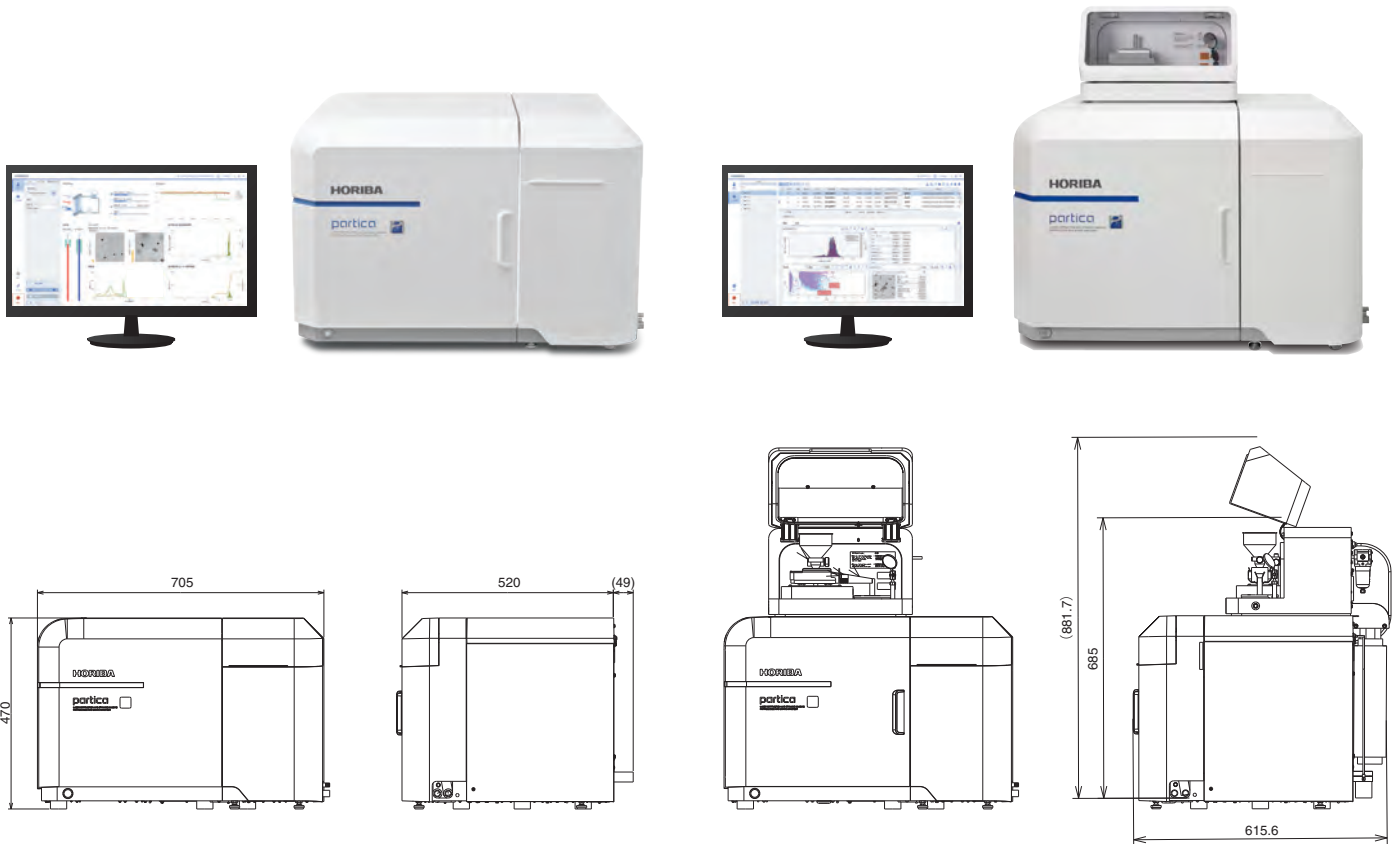
Model		LA-1000 series	LA-970 series
Measurement principle	DIA	Dynamic Imaging Analysis	-
	LD	Mie scattering and Fraunhofer diffraction	
Total measumet range		0.01 - 8000 μm	0.01 - 5000 μm
Measurement range (Wet)	DIA	0.3 - 3000 μm^*	-
	LD	0.01 - 3000 μm	0.01 - 3000 μm
Measurement range (Dry)	DIA	1.1 - 8000 μm^*	-
	LD	0.1 - 5000 μm	0.1 - 5000 μm
Light sources		LD(650 nm) : 5 mW, LED(405 nm) : Maximum 10 mW	
Number of cameras		2 (Dual Camera system)	-
Camera performance		Maximum 300 fps	-
Digital resolution		Minimum 0.3 μm	-
Measurement parameters		More than 30 image analysis parameters	
Dimensions and weight**		W720 mm D565 mm H470 mm, Approximately 56 kg	
Optional accessories		Powderjet Dry Powder Feeder, MiniFlow unit, Fraction cell, High Concentration cell, Paste cell	

*Depends on particle shapes

** Dimensions and weight exclude pipework and other protrusions, and optional accessories

Partica standard system

With Powderjet Dry Powder Feeder



HORIBA Group is certified Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001 and operate as Integrated Management System (IMS).



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