

Centrifugal Nanoparticle Analyzer

## partica CENTRIFUGE



### High resolution particle size distribution measurement by centrifugation

#### Realizing precision particle size distribution measurement for undiluted to dilute samples

The key features of centrifugation is that the particle size is measured following classifying by size. As a result, a wide range of high-precision results can be obtained in a single analysis. Partica CENTRIFUGE enables you to measure by two measurement techniques: The "Line-start mode" and the "Homogeneous mode".

#### Small amounts of foreign particle or agglomeration can be captured

With its high resolution, Partica CENTRIFUGE can capture a small amount of foreign particles. This instrument enables you to obtain reliable measurement results throughout the range of the particle size distribution, including small populations, as well as to the low area of the distribution.

#### Features stable measurement even for the long time measurements

The cooling function of the sample chamber and the rotor prevents temperature increases of sample fraction during rotation. This improves the reliability of the measurement results by keeping the viscosity constant. Partica CENTRIFUGE is designed for quieter, easier, safer operation.

### Robust and easy to use !

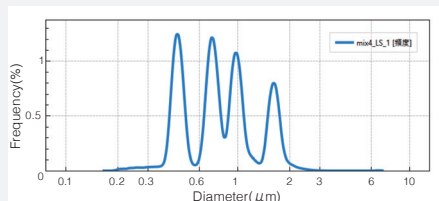


- Measure merely by introducing the sample into the cell.
- Easy to clean, easy to replace cuvette-type sample cell reduces the risk of cross-contamination.

### Measurement Examples

#### High resolution particle size distribution measurement

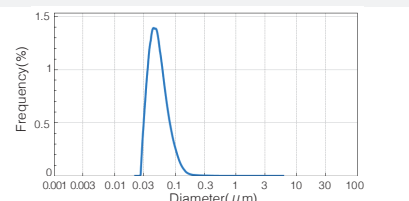
As a result of measuring a mixed sample containing four types in equal concentrations of, standard silica particles, four types of distributions were obtained with almost the same area. Using the line-start mode measurement, an accurate particle size distribution is obtained because the particles are classified by the centrifugal force.



Sample: Standard particles (One drop each of particles with sizes of 0.48  $\mu\text{m}$ , 0.73  $\mu\text{m}$ , 0.99  $\mu\text{m}$ , and 1.57  $\mu\text{m}$  are mixed)  
Amount of sample: 10  $\mu\text{L}$   
Solvent: Aqueous sucrose solution  
Measurement condition: Line-start mode

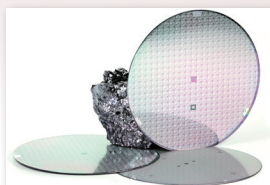
#### Measurement of the particle size distribution of a small quantity, high concentration sample

Example of black pigment used for inkjet printers starting with an undiluted solution. As a result, the particle size distribution of a high concentration sample, which is difficult to measure is shown, with high precision from a small 2  $\mu\text{L}$  sample.



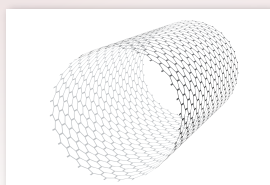
Sample: Black pigment for inkjet printers (undiluted solution)  
Amount of sample: 2  $\mu\text{L}$   
Solvent: Aqueous sucrose solution  
Measurement condition: Line-start mode

## Applications



### Semiconductor

CMP slurry



### Functionalized nanomaterials

Carbon nanotubes  
Advanced carbon material  
Cellulose nanofibers



### Pigment / Ink

Pigment / Dye, toner  
Emulsions

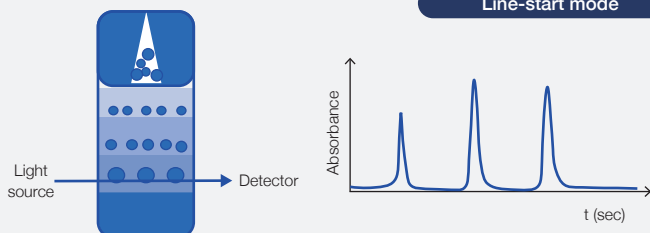


### Energy

Battery materials  
Ceramics

## Differences between the line-start mode and the homogeneous mode

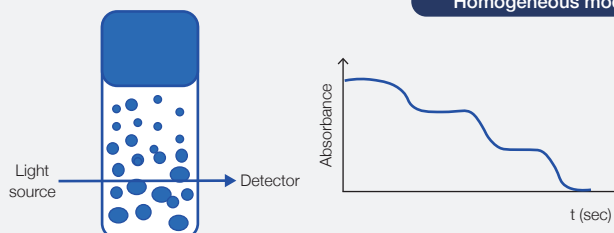
### Line-start mode



A sample is (automatically) introduced into the density gradient solution, and the particle size is calculated from the settling time required to reach the detector. This mode enables you to measure a very small quantity of **high concentration sample** with high resolution.

Required amount of sample: Approx. 10  $\mu$ L  
Solvent: Density gradient solution

### Homogeneous mode



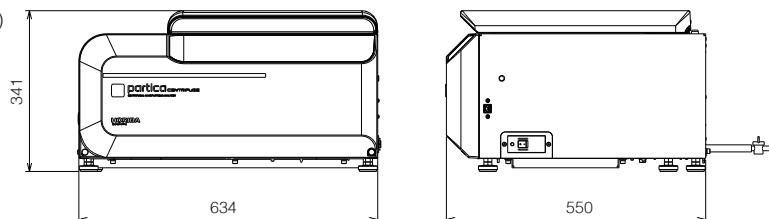
Settling starts from a uniformly distributed sample, and the particle size distribution is calculated based on the information of particles passing through the detection zone. This mode is suited for measurement of **low concentration samples**.

Required amount of sample: Approx. 1.5 mL  
Solvent: Not required

## Specifications

Measurement method	Centrifugation using a cuvette cell: Both the line-start mode and the homogeneous mode
Measurement range	10 nm - 40 $\mu$ m
Max. centrifugal force	30,000 G
Temperature control	The rotor, cell, and sample temperatures are controlled to a fixed temperature by the refrigeration.
Working temperature	15 - 25°C
Dimensions	634 (W) $\times$ 550 (D) $\times$ 341 (H) mm
Mass	100 kg
Option	Density gradient fractionator (CY-301)

### Dimensions (Unit: mm)



## Option



Density gradient fractionator  
(CY-301)



The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001. We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.



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