

For R&D • For Small amount sampling

 **Ashizawa**

Wet Grinding / Dispersing

STARMILL Lab Series

A Single
Common Frame
for 3 Different
Uses

Scale-up
to Production
Size

Corresponds
to the
Microbeads



Best for
Nano Level
Dispersing

Easy Handling

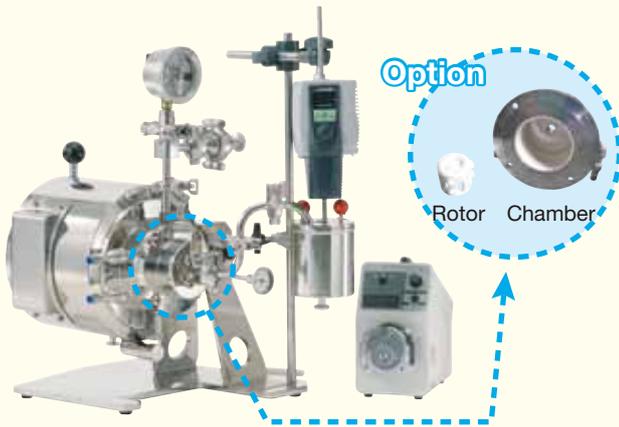
Batch Type

Your Partner for Fine Particle Technologies

 **Ashizawa** Ashizawa Finetech Ltd.

The Smallest Laboratory Size of STARMILL

(Minimum batch amount: 100cc~)



A Single Common Frame for 3 Different Uses

When you are facing problems related to micronization, Ashizawa offer you the best solution by deciding whether the material is grinded or dispersed.

Labstar Mini is a laboratory sized bead mill with changeable chambers and agitators according to type of micronizing (grinding or dispersing). It is also changeable to batch type which is best for sampling a small amount of slurry.

1

For Grinding

LMZ015

Features

① The Laboratory size LMZ Mill

LMZ015 is excellent for grinding particles to sub-micron size.

② For Strong Shear Grinding

Particles are grinded in pieces from strong shear movement of the beads. Dispersing in high viscosity slurry needs strong shear power, which can be achieved using LMZ015.

③ Centrifugal Separator with Screen

Combination of Centrifugal separator and screen, high viscosity slurry can also be operated.

➔ Microbeads can be used, and this enables finer grinding level

④ High Energy Density Chamber

Narrow grinding area and the projections on the rotor produces great energy within the chamber, and move the beads strongly.

2

For Dispersing

NANO GETTER DMS65

Features

① The Laboratory size mill of NANO GETTER

The smallest size of NANO GETTER which is excellent for nano dispersing.

② Mild Dispersing

"Rolling" power of beads can separate particles into pieces (see the right diagram). This "rolling" method reduces the particles' damage to the minimum.

➔ Prevents re-agglomeration and contamination

③ Screenless

Our original centrifugal separating system now allows to operate without screen.

➔ Easy handling of microbeads

Eliminates the pre-grinding process

④ Small L/D

Homogeneous movement of beads leads to higher efficiency of energy.

3

Batch Type
For grinding and dispersing

MAX NANO GETTER HFM02

Features

① Ideal Beads Movement for Dispersing

Straightening vane in the bead mill controls beads movement. This realizes "Mild Dispersing" maintaining high efficiency and high quality.

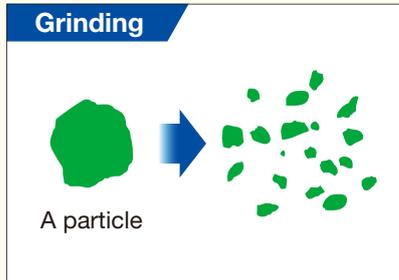
② The Minimum Sampling from 100cc

Batch type chamber doesn't require other equipments such as pumps, pipes, etc. HFM02 is ideal for tests using a small amount of slurry.

STARMILL LABSTAR *mini*

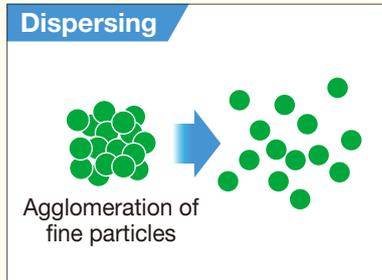
Grinding

Break /shatter a particle



Dispersing

Separating fine particles



Swiveling chamber makes it easier to handle. Chamber angles can be adjusted for each process.



Beads Discharge Position



Operating Position



Beads Filling Position
※Operating Position (HFM02)

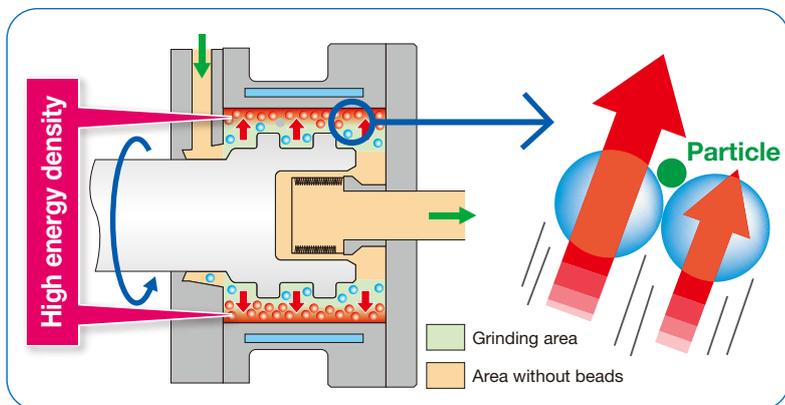
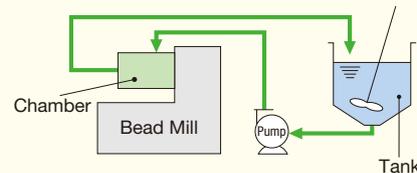


Diagram of LMZ015 and the movement of beads

Difference between Re-circulation System and Batch System

● Re-circulation System

Slurry in tank is pumped to the chamber to be dispersed. The slurry is pushed back to the tank again. The slurry circulates through this system repeatedly.



● Batch Type System

Slurry stays only in the chamber and be dispersed, No pumps, pipes, and other components are needed.

■ Advantages and Disadvantages of Re-circulation system / Batch system

	Advantages	Disadvantages
Re-circulation system	<ul style="list-style-type: none"> • Can manage large amount of slurry using small sized mill • Amount of slurry can be changed 	<ul style="list-style-type: none"> • Need pumps, pipes and other components.
Batch system	<ul style="list-style-type: none"> • Can run with small amount of slurry. • No pumps, pipes, and other components needed. 	<ul style="list-style-type: none"> • Unsuitable for mass production • Amount of slurry is fixed.

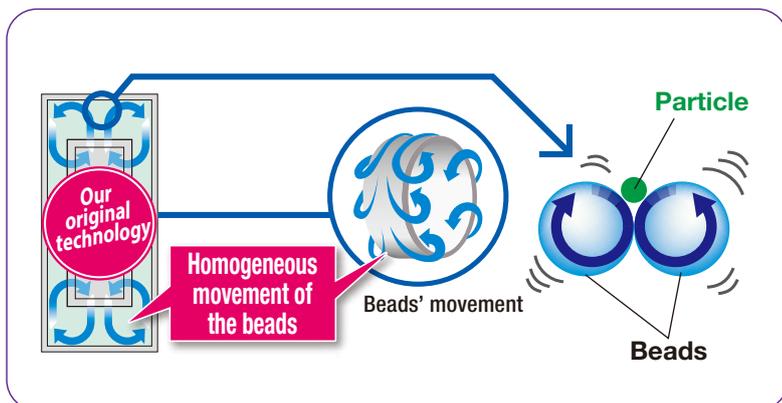


Diagram of DMS65 and the movement of beads

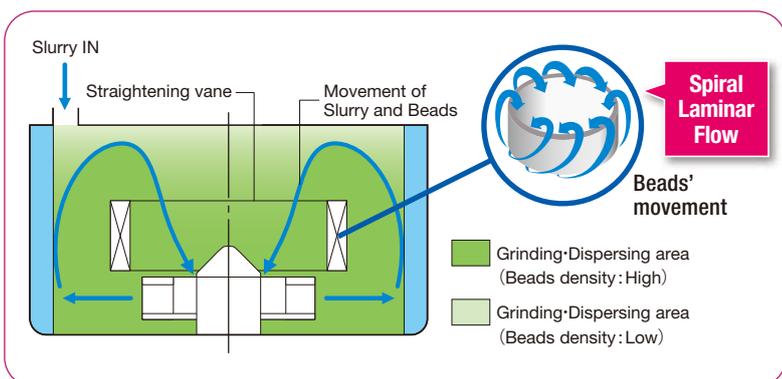


Diagram of HFM02 and the movement of beads

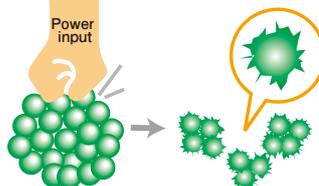
What is Mild Dispersing?

Mild Dispersing is Ashizawa Finetech Ltd.'s original dispersing technology, which maintains size, shape, a crystal structure, and a surface condition of a primary particle.

Conventional Dispersing

Concentrated power input

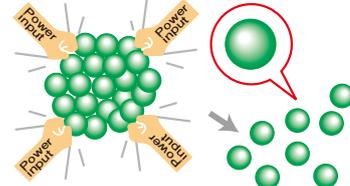
Particles are easily damaged thus causes re-agglomeration



Mild Dispersing

Distributed power input

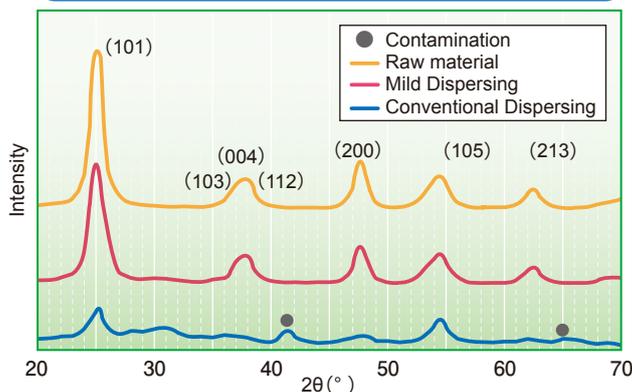
Particles are not damaged, thus particles' attributes are kept



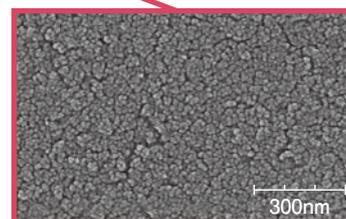
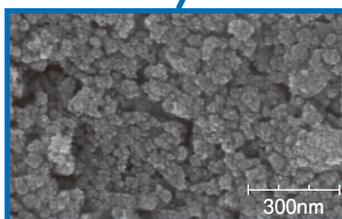
Mild Dispersing can disperse particles...

- to primary particles without damaging their crystal structure
- without re-agglomeration by suppressing the surface activity
- with little wear and contamination

The result of X-ray diffraction (Processed Sample)



e.g. Dispersing Photocatalyst (Titanium Oxide)



Specifications

	LABSTAR <small>mini</small>		
	LMZ015	DMS65	HFM02
Grinding Chamber Volume (ℓ)	0.17	0.12	0.2
Batch Volume (ℓ)	0.25~0.5		0.1
Motor (kW)	2.2		
Circumferential Velocity(m/sec)	4~14	6~15	6~15
Bead Diameter (mm)	0.1~0.5	0.03~0.3	0.03~0.2
Separation System	Centrifugal Separator with Screen	Centrifugal Separator without Screen	—
Operating Method	Re-circulation		Batch Type
The Shaft Seal	Double Mechanical Seal		
Agitator/ The Inner Surface of Grinding Chamber	Ceramics		Ceramics and Nylon
Dimension, Weight (W×D×H)	Bead Mill: 400×550×600mm · 40kg / Whole Unit: 1400×600×590mm · 90kg		

Your Partner for Fine Particle Technologies

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