MMSD
Micro Mist Spray Dryer

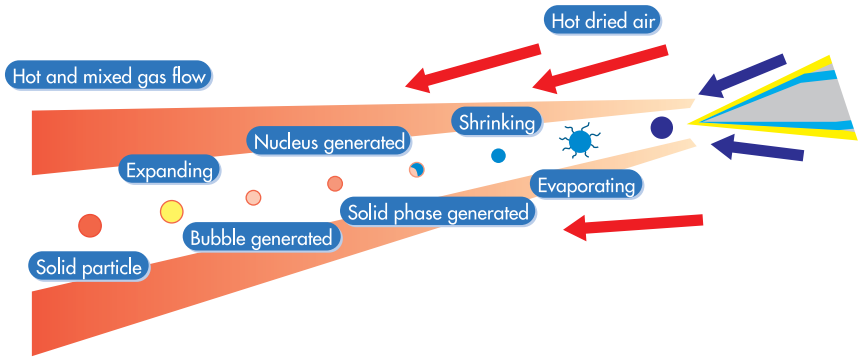
Features on conventional spray drying method

The spray drying method was originally designed at the beginning of the 20th century in Europe for drying skimmed milk and is widely used today in many fields and applications.

- Spray drying system is simpler than other drying methods since the powder is available directly from liquid material (solution or suspension).
- By atomizing the liquid, surface area per unit weight increases, thus higher efficiency forcontacting to hot air is achieved and drying process can be carried in a shorter time.
- Due to the latent heat of evaporation, surrounding fine powder during the process will not be at a high temperature. This system is therefore suitable for material that is vulnerable to heat.
- As the atomized liquid becomes spherical due to surface tension, the dried powder also does.

Micro Mist Spray Dryer

The Micro Mist Spray Dryer produces very fine and uniform powder by drying atomized liquid particles instantaneously in contact with hot air.
Atomized liquid particles of 10 micron or over in diameter are characterized as spray droplets, on the other hand particles under 10 micron in diameter are characterized as mist.
Our four-fluid nozzle enables liquid to be sprayed as mist in large volume.
For this reason, we have named our product the Micro Mist Spray Dryer.
The Micro Mist Spray Dryer achieves single micron range particle size that cannot be obtained in production scale with conventional spray dryers.
Previously, fine powder has been produced by either pulverization or classification methods in addition to spray drying. However, we are proud to introduce our Micro Mist Spray Dryer which produces very fine and uniform powder directly from liquid. You will induce many merits by fine powder using the Micro Mist Spray Dryer.



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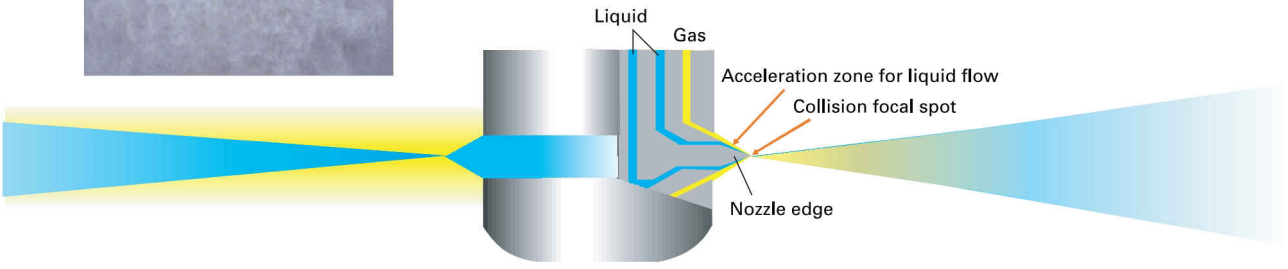
Four-Fluid Nozzle(patented in Japan and overseas)

The theory is : The nozzle has each two passages for gas and liquid, and the nozzle edge profile generates one collision focal spot for fluid exit. In addition, the nozzle edge profile generates liquid thinly with a high-speed gas flow and the shock wave created at the tip edge (focal spot of collision of fluids) produces the mist.

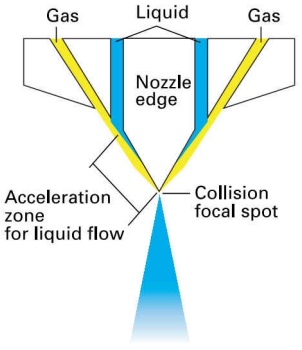
production model



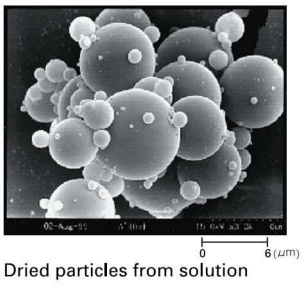
The features is :

- Large atomizing capacity of particles in single micron size.
- Controllable liquid particle size.
- Ability to atomize two kinds of liquid mixing at nozzle tip.
- Sharp and narrow particle size distribution is available.
- Continuous atomizing operation is possible for hours without the trouble of clogging, as the nozzle has a self-cleaning function and the nozzle is outside mixing type.
- By changing the edge diameter, adjustment with various production volumes can be achieved.

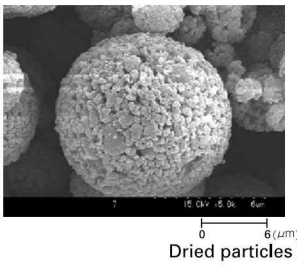
laboratory model

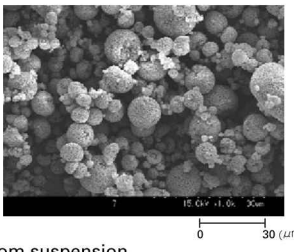


Dried particles with Micro Mist Spray Dryer

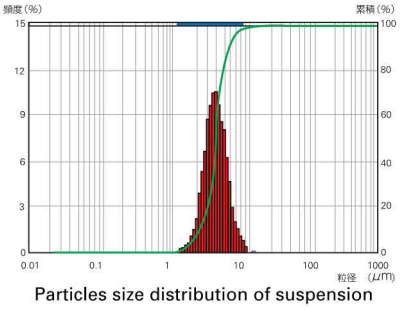


Dried particles from solution





Dried particles from suspension



Particles size distribution of suspension

MMSD Micro Mist Spray Dryer for Laboratory

MDL series

Features of the Micro Mist Spray Dryer for Laboratory

Compact Spray Dryer developed to produce very fine powder of single micron in a simple operation.

- Many kinds of experiments can be performed using the four-fluid nozzle feature.
- Very fine and uniform powder is available from a small quantity of sample.
- Transparent glass chamber is available to observe the atomizing condition.
- Easy to clean, disassemble, and reassemble.
- Simple Touch panel control system.
- Experimental data can be confirmed on the monitor screen.
- Scale up from laboratory to production scale with the same particle size is possible.
- Many options are available for various purpose.

MDL-050 Series

MDL-050B
Basic type

MDL-050C
Cyclone type

For pharmaceutical
MDL-050S
GMP model

MDL-050M
Continuous operation type

MDL-050 Standard specifications

Specifications	
Name	Micro Mist Spray Dryer
Model	MDL-050
Power source	200V three phase
Consumption	5KW
Dimension	W900mm ～ ×D810mm×H1660mm
Weight	220kg ～ 280kg

Performance	
Evaporation	3kg/h
Atomizing device	Four-fluid nozzle
Drying air pattern	Co-current air flow
Collecting	Filter collection
	Cyclone+Filter collection
Liquid feed pump	Roller tube pump
Fan blower inlet	Air filter
Hot air generator	Electric heater 4KW
Hot air temperature	40 ～ 200℃
Hot air volume	1.0m³/min 20℃ 1atm

Nozzle air	Flow meter 6 ～ 60L/min×2 20℃ 0.6MPa
Operation	Max 5KPa
Control	Touch panel. Sequencer

MMSD Micro Mist Spray Dryer for Product

MDP series

Features for MDP series for production

- It can produce a large amount of fine powder below 10 microns, which was difficult in other method.
- It can reduce the residence time in the drying chamber and make the chamber smaller than before.
- It can produce below 10 microns without using any pulverizer/air classifier.
- By making particles with single microns diameter, it can dry the liquid which is difficult to dry or needs to dry under low temperature.
- It can scale up to a larger model to suit anypurpose from laboratory to production scale

MDP series spray dryer for demonstration at our factory

MDP-050

Evaporation capacity: 50kg/hr
Drying chamber : ϕ2.5×4.5m

MDP-200

Evaporation capacity : 200kg/hr
Drying chamber : ϕ3.8×5.5m

We design and manufacture MDP series according
to the each customer's requirement in capacity and floor space