

MMSD can atomize liquid in fine particle.

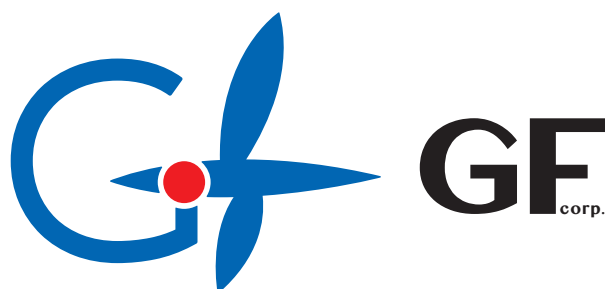
# Micro Mist Spray Dryer

## Micro Mist Spray Dryer

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The kinds of atomized droplet size are classed as **the spray** (over 10 microns) or **the mist** (less 10 microns). It is Micro Mist Spray Dryer that sprays much the mist with our atomization nozzles.



**Smallest droplet in the industry**

**Mass production**

# Atomization Nozzle for Spray Dryer

[FEATURE]

- Atomize sharp and narrow particle size.
- Continuous atomizing without the trouble of clogging because of the outside mixing type.
- Adjust with various production volumes.

## Tri Spire Nozzle

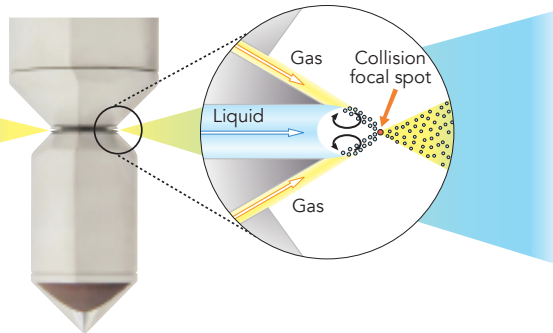
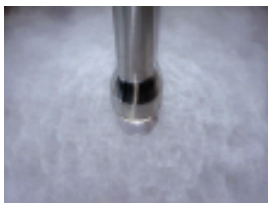
### Tri Spire Nozzle <TN Nozzle> <TS Nozzle>

- This model is the new type based on 'Four-Fluid Nozzle'.
- Atomize smaller droplet than Four-Fluid Nozzle because the liquid is spreaded out thinly by the high-speed gas and the droplets collide with each other.
- Achieve the cost reduction because of one liquid passage way and two air passage way.
- Prevent abrasion of the nozzle because the air doesn't hit its surface directly.

Patented in Japan

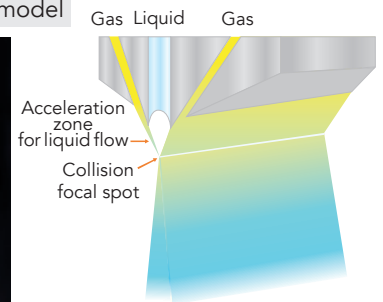
#### <TN Nozzle>

Production Model



#### <TS Nozzle>

Laboratory model



## 4 Fluid Nozzle

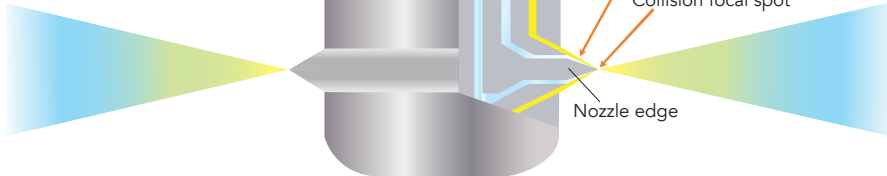
### Four-Fluid Nozzle <CN Nozzle> <SE Nozzle>

- This structure is order to make a point the droplet spreaded out by the air from each passage way.
- Manufacture mists with the shock wave generated at the nozzle edge.
- Atomize two types of the liquid.

Had been patented

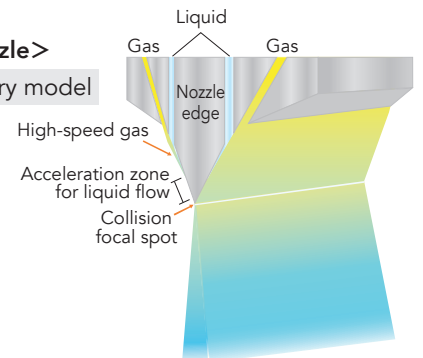
#### <CN Nozzle>

Production Model



#### <SE Nozzle>

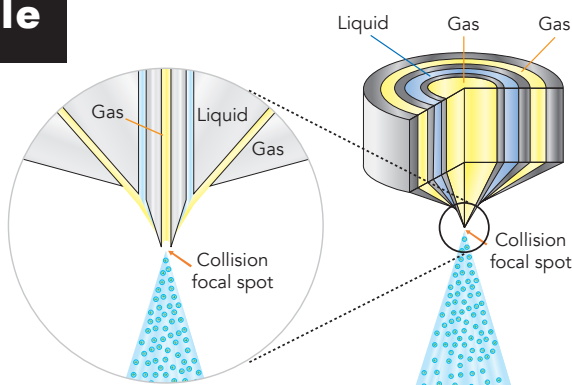
Laboratory model



## Pencil Edge Nozzle

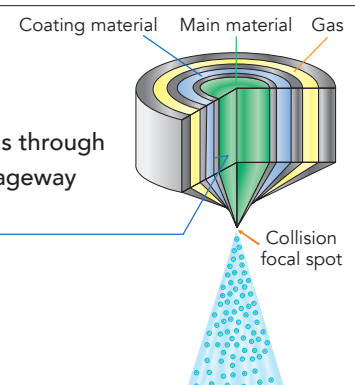
### Pencil Edge Nozzle <PN Nozzle>

- This nozzle can atomize more uniform than TS and SE Nozzle.
- It can make the particles fine coated and micro encapsuled by changing the usage. (#1)



# 1

Changed the gas through the center passageway into the liquid.



# Micro Mist Spray Dryer

[FEATURE]

- Performs many kinds of experiments using the Four-Fluid Nozzle features.
- By making particles with single micron diameter, it can dry the liquid is difficult to dry or needs to dry under low temperature.
- Touch screen control system.

**MDP**  
series

## Product Model

- This model is for product with same ability as MDL series.
- Atomize droplets are easy to dry, so the drying chamber gets more smaller.
- We design and manufacture MDP series on your needs, for example evaporation capacity, utility and installing space.

## Installation Experiences



MDP-020



MDP-030



MDP-050



MDP-200

**MDL**  
series

## Laboratory Model

- Produces very fine and uniform powder from a small quantity of sample.
- Easy to clean, disassemble and ressemble.
- Many options are available for various purpose.

### Basic Type



MDL-050B



MDL-050C

### Continuous Operation Type



MDL-050(C)M



MDL-100 (C) M



MDL-150 (C) M

### Organic Solvent Type



MDL-015(C)MGC-S



MDL-050(C)MGC-S

### GMP Model



MDL-050BG



MDL-050MG

### Continuous Operation Type [for High Temperature]



MDL-015 (C) M-H

## Test inspection & Powders trust processing

...We can provide you with your all needs.



Validate the ability  
and  
specifications upon  
facility introduction.

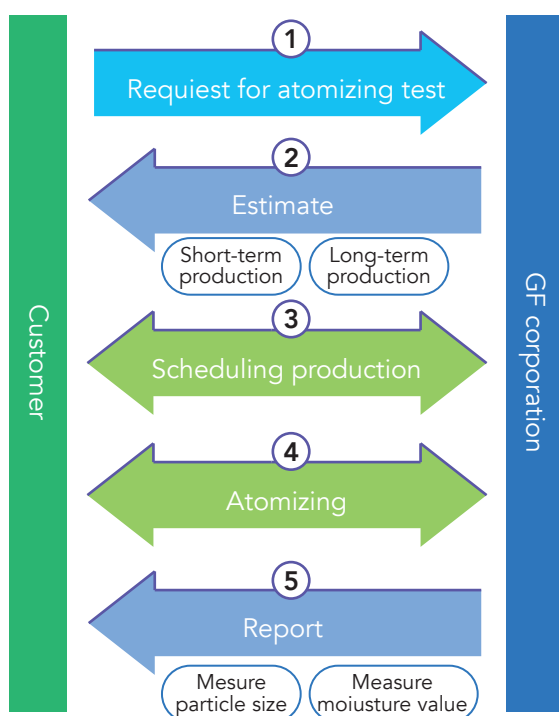
Test  
with many kinds of  
materials.

Scale up  
production.

Need small quantity  
of sample  
to evaluate product.

Need much powder  
for products.

### Powders Trust Processing Flow



### Example for Material

- Battery material
- Barium titanate
- Ferrite
- Alumina
- Zirconia
- Silica
- Resin
- Cosmetics
- Medical products

etc...

### Equipments

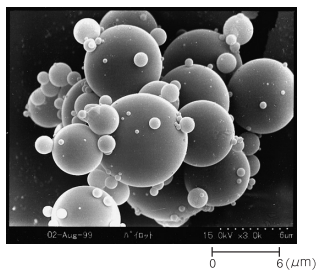
Type	Nozzle	Water evaporation amount
MDL-015 (For Organic Solvent)	TS Nozzle	1kg/H
MDL-015 (High-Temperature Type)	SE Nozzle	1kg/H
MDL-050	PN Nozzle	3kg/H
MDP-030	TN Nozzle	30kg/H
MDP-050	CN Nozzle	50kg/H
DJE-003R	Rotary Atomizer	3kg/H

### Evaluation Device

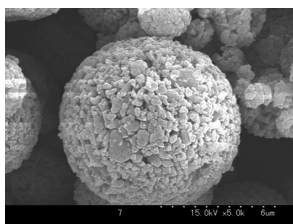
Particle size analyzer	LA-300 (Made by HORIBA)	Moisture value meter	FD-660 (Made by Kett)
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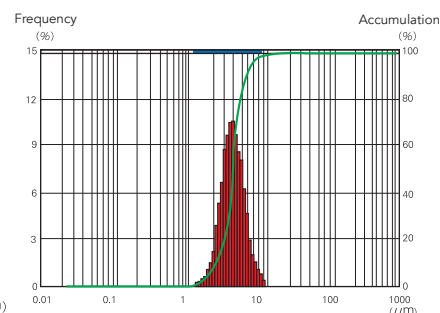
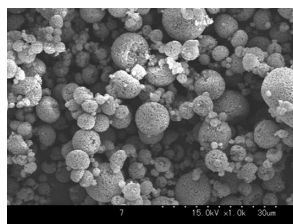
## Dried particle with Micro Mist Spray Dryer



Dried particles from suspension



Dried particles from solution



Particle size distribution of suspension



for the **People**, for the **Future**

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corp.

**GF corporation**

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