Low-temperature drying and grinding mill

Dries and grinding any materials instantly while retaining ingredient characteristics!

Centrifugal Dryer add Mill

Moisture evaporates instantly in less than 1.0 seconds from drying to grinding to recovery.

Drying at low temperature (100℃ or less) makes it a powder with a higher level of taste, flavor,and color.

Mechanical & Structural features

- No foreign matter mixed in since there are no collision between metal parts.
- Materials are processed into powder just by supplying them into the machine.
- Easy particle size adjustment by inverter control.
- Requires no special facilities since the system doesn't need a large heating source.
- Prevents overheating by a dual-step safety device.
- Space saving is possible due to the compact design.
- The sanitary structure makes it easy to disassemble and clean.

Drying and grinding principle and features

① Generates cyclonic air up a speed of 100~120m/sec by rotating blade.

② Materials are finely fine grinding by mutual particle collisions in high-speed cyclonic air.

⇒ By making the raw material finer, the surface area increases and it dries instantly.

⇒ When the raw material dries, it becomes easier to fine grinding and further micronization progresses.

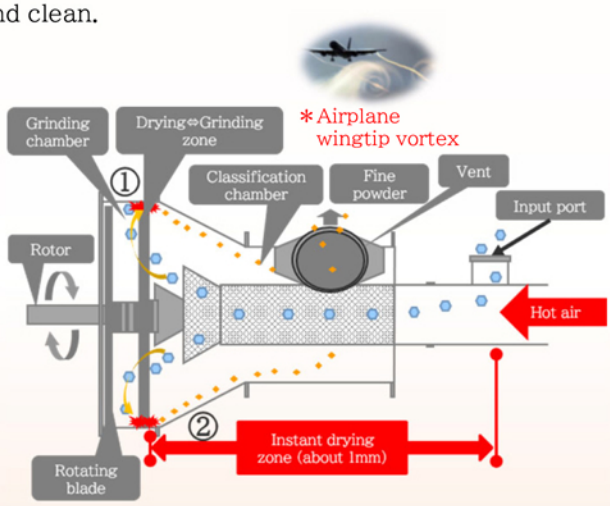
◆ Drying and grinding within 1.0 second.
(The time the material is inside the machine)

⇒ In most cases,materials are dried at low temperatures no higher than 100℃

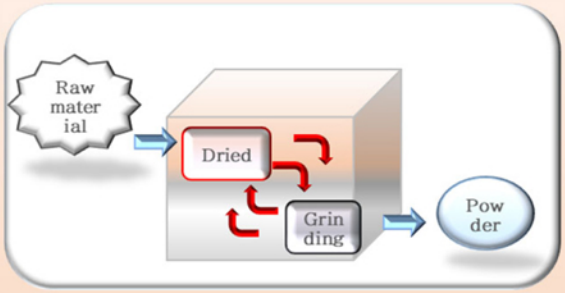
⇒ Minimizes alteration and deterioration of material components due to heat.

◆ Simultaneous bactericidal effect can be expected.
(Drying temperature: 80℃ or higher)

⇒ General viable bacteria count 300 or less, E. coli negative, etc.



Drying - Grinding cycle and Sterilization principle



◆ Water-containing raw material

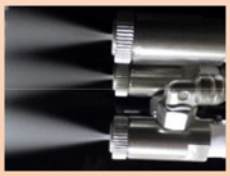
Using the left-shown drying and fine grinding principle,materials are dried instantly.
At that time, heat is applied to each particle to evaporate [Water -containing], and the same effect as [steam sterilization] can be obtained.
The system has a track record of effectively sterilizing regular common bacteria and E,coli.
However, it is not able to completely sterilize spore-forming bacteria with heat resistance and other certain bacteria since the heating time is 0.5 seconds or less.

◆ Dry raw material

Unlike [Water-containing]materials,the same effect as that of steam pasteurization cannot be achieved with dry materials.
However,materials are loaded together with hot air at 80℃ to 100℃ to fine grinding the materials in a cavity that is generated by the airflow of hot air.
While it depends on the materials and bacteria they contain,sterilization is possible in some cases.
When the bacterial count is not lowered after once,in some cases the bacteria can be sterilized by processing twice.

Liquid and slurry raw materials can be instantly powdered

Spray type for liquid raw materials



The drying time is reduced by spraying the material (converting it into fine particles)and mixing it with hot air.

(After drying and grinding)
Water content:5.9%
Particle size:15.8μm(d0.5)

Slurry jet type for slurry raw materials ※ Patented

Slurry materials,which are difficult to supply stably, can be jetted by slurry jet generator.

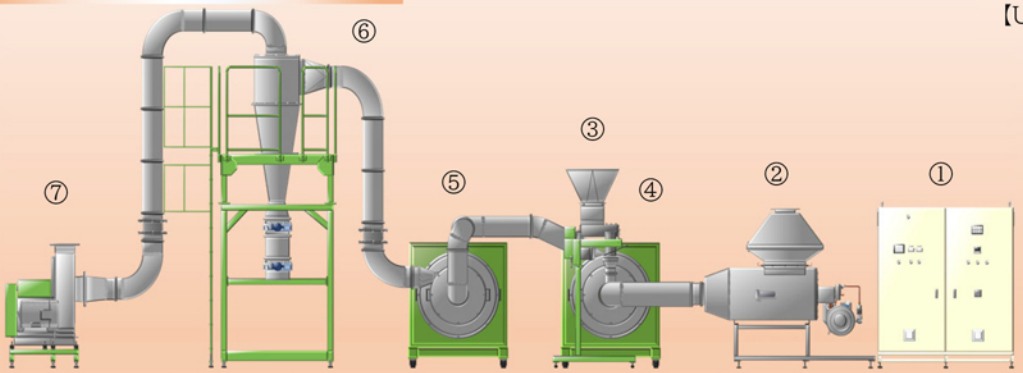
(After drying and grinding)
Water content:0.7%
Particle size:18.4μm(d0.5)

Amount of grinding Capacity on model and particle size

Centrifugal Dryer add Mill	Grinding Capacity	
Model	For 30μm	For 60μm
CDM2-350W	5kg/h	7kg/h
CDM10-550W	15kg/h	25kg/h
CDM20-700W	50kg/h	75kg/h
CDM70-1000W	150kg/h	250kg/h

・Processing amount may vary significantly depending on the raw material and target particle size.
Thrinding e stated grinding capacity should only be viewed as a guide.

System configuration



【Unit example：CDM70-1000W】

① Control Pane
② Hot air dryer
③ Screw feeder type feeding device
④ 1st Grinding mill body
⑤2nd Grinding mill body
⑥ Cyclone type powder recovery device (With automatic discharge butterfly valve)
⑦ Suction blower

Model	Grinding Motor	Grinding Capacity	Fine powder Recovery unit	Input port size	Supply device Supply volume	Utility	Occupied area Device mass
CDM2-350W	2.2kw (2 units)	2~5 kg/h	Batch type	φ21	Screw Feeder 16L	AC200V·3-Phase·175A	L3000×H2200×W3000 980kg
CDM10-550W	7.5kw (2 units)	10~20 kg/h	Batch type	φ47	Screw Feeder 16L	AC200V·3-Phase·225A	L4500×H2200×W4000 1300kg
CDM20-700W	15kw (2 units)	30~60 kg/h	Continuity	φ72	Screw Feeder 115L	AC200V·3-Phase·225A LPG 6.3㎥/h Supply air 0.5MPa 100Nℓ/min	L5000×H4000×W9000 3300kg
CDM70-1000W	55kw (2 units)	100~200 kg/h	Continuity	φ133	Screw Feeder 115L	AC200V·3-Phase·700A LPG 17㎥/h Supply air 0.5MPa 250Nℓ/min	L7500×H5000×W9000 4300kg

◆ Processing amount may vary significantly depending on the raw material and target particle size.
Thrinding e stated grinding capacity should only be viewed as a guide.
◆ The equipment will be delivered on-board, and transportation costs, machine. installation, electrical work, air and gas piping work will be charged separately.
◆ Continuous butterfly valve discharge is available as an option.
◆ Since the Centrifugal Dryer add Mill does not have a filter, it is recommended to install an aftertreatment device such as a dust recovery device if necessary.

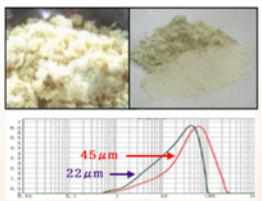
Processing Example

Raw material	Particle size (d0.5)	Raw material	Particle size (d0.5)	Raw material	Particle size (d0.5)	Raw material	Particle size (d0.5)	Raw material	Particle size (d0.5)	Raw material	Particle size (d0.5)
Kale	27.3μm	Carrot	55.3μm	Rice bran	33.3μm	Azuki bean skin	40.7μm	Yam	24.7μm	Bamboo powder	39.0μm
Barley grass	70.1μm	Burdock	44.2μm	Rice malt	16.9μm	Almond skin	33.5μm	Taro	47.0μm	Chinese medicine extraction residue	48.0μm
Green juice residue	72.5μm	Tomato	21.6μm	Soaked rice	20.6μm	Green soy bean (Edamame)	36.9μm	Wild rice stems	36.3μm	Oil-soluble material	14.7μm
Spinach	73.5μm	Bamboo shoot	24.4μm	Cooked rice	20.7μm	Asian ginseng	22.0μm	Agaricus mushroom	34.8μm	Brown coal	25.9μm
Broccoli	45.4μm	Pumpkin	55.4μm	Rice	22.8μm	Sake lees	22.3μm	Salmon flakes	25.1μm	Edible charcoal	9.5μm
Japanese mustard greens	52.3μm	Pumpkin seeds	39.4μm	Bread crust	16.8μm	Aloe arborescens	57.8μm	Soft roe paste	7.1μm	Loess	8.4μm
Asparagu	44.8μm	Japanese white radish	78.7μm	Rose flower	38.2μm	Fruit	31.1μm	Dried bonito shavings	23.0μm	Milk	10.4μm
Lettuce	88.7μm	Garlic	46.1μm	Chestnut skin	19.9μm	Acerola	32.3μm	Kelp residue	65.7μm	Yogurt	9.2μm
Nozawane leaves	69.1μm	Onion	49.9μm	Okara	22.0μm	Taro corm	30.4μm	Shellfish	12.4μm	Enzyme solution	33.0μm
Kinjiso leaves	17.2μm	Eggplant	30.7μm	Soy bean (water-added)	39.8μm	Sweet potato	21.4μm	Egg shell	7.2μm	Rice protein solution	5.1μm

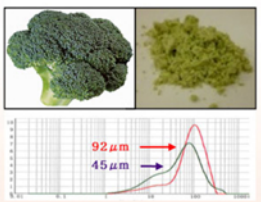
Features of finished powders with drying and grinding

- The combination of airstream fine grinding and our original technology enables production of uniform powder without sieving.
- By autogenous fine grinding by air stream, powder particles are finished in a round shape.
- Achieves a sharp particle size distribution.
- Since there is little heat history, it will be a colorful powder.

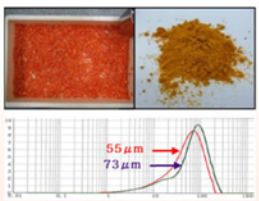
<Okara powder>



<Broccoli powder>



<Carrot powder>



User Comments

- The colors and flavors are retained even after the material is dried.
- We had always thought of drying and pulverizing as separate processes. This machine has allowed combine them into one.
- We were able to create a new type of powder by processing a moisture-containing into in one go.
- This machine is revolutionary since it can perform drying and pulverizing of both solid materials and fluids.
- The amazing thing about this machine is that it doesn't cause thermal denaturation because powders are produced at a relatively low temperature.

Contact

PBJ Powder Bank Japan
Powder Bank Japan Corporetion
3-19-2 Kasumi-cho, Maruoka-cho,Sakai-shi,
Fukui 910-0231,JAPAN
TEL：+81-776-66-2699 / FAX：+81-776-43-3960
URL ：https://www.pb-j.jp
E-mail：info@pb-j.jp

2021.11