SHUOBODA instruments

Spray Dryer

Mini, Pilot & Production scale1~25um &1~100um diameter powder
SPD-15A to be able to process organic solvent
Freezing spray dryer can process fruit juice

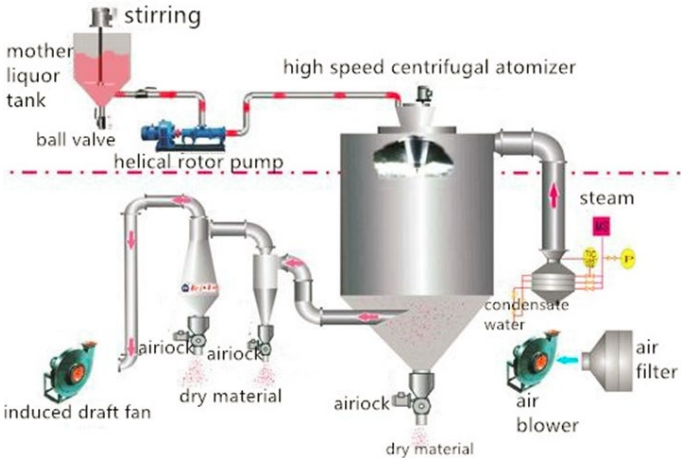
Catalogue of Laboratory/Pilot Spray Dryer

CE ISO

CONTENTS

What is spray drying?

Spray drying is a process of drying water solution, emulsion and so on. It is widely used in Industrial
Chemistry and food industry. Dry milk, detergents and dyes are only some of the products currently dried by
spray dryer. Spray drying can be used to preserve food or only as a quick drying method with the advantages light
weight and small volume.



Spray drying is usually a method of injecting a fluid mixture into the hot dry air for drying. The solvent
usually is water-based; it is instantly volatilized by hot air. This evaporation process removes heat quickly so that
the product is dried gently without being affected by heat. The product becomes powder, particle, or lump within
seconds.

Applications

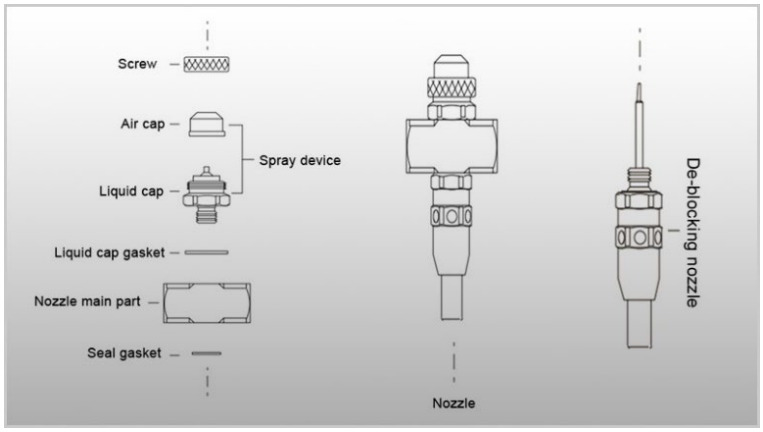
1. SPD-18A LAB Mini Spray Dryer

ATOMZATION SYSTEM: TWO-FLUID ATOMZER AND FLOW(IMPORTED PARTS)

- Professional designers' surgeon design, patent application has been submitted
- Full body painting process
- Mechanical parts grinding secret agents, only the pursuit of perfection
- American Spray double fluid nozzle is an excellent high precision spray nozzle. The instrument uses an external mixing nozzle, the air and liquid streams can be individually controlled to effectively spray highly viscous liquids and suspended abrasives.
- Double fluid nozzle is installed at the center of the top of the air distributor and sprays directly down into the tower. The feed enters at a minimum pressure through a tube inlet of the nozzle and is atomized with compressed air.

METICULOUS & STABLE SPRAY DRYING

- Two fluid spray nozzle imported from US.
- Deblock interval adjustable
- Power supply & Fan imported from Taiwan
- *Schneider* & Siemens electric components
- LCD touch display from Taiwan
- 3.3 high borosilicate glass ensure safety working



Spray shape

DELICATE DESIGN ON APPEARANCE

Whole-body spray-painting process

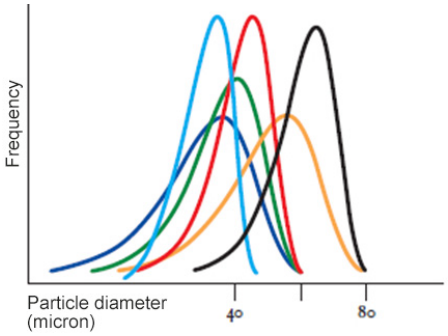
Quick release design to let experiment in easy way

SIEMENS PLC

Fuzzy PID control, precise & humanity

ADVANCED INTERFACE

- Intelligent & humanity LCD interface
- Visual touch operation, animation demo process flow
- Inlet temperature, outlet temperature, frequency value, pricker frequency can be display and control
- Data logging, analysis, alarm and overload protection
- Comes with USB interface, data to be exporting easy

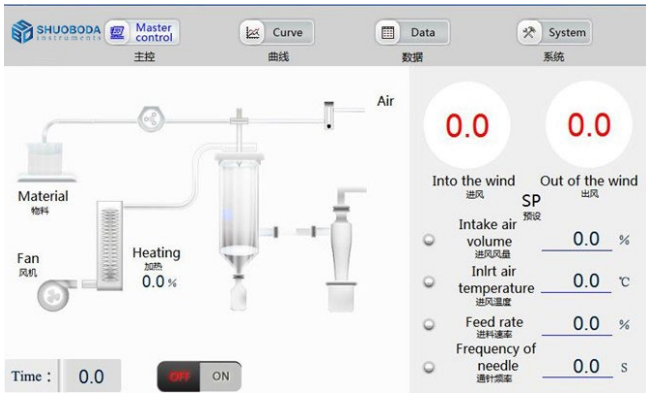


Particle size distribution

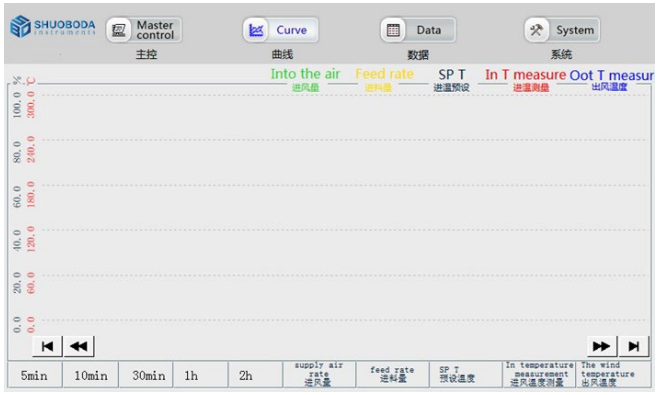
formed by different atomization methods under comparable conditions

- Two-fulid spray nozzle, Parallel flow
- Two-fulid spray nozzle, Fountain flow
- Rotary atomizer, Parallel flow
- Pressure spray nozzle, Fountain flow
- Pressure spray nozzle, parallel flow
- Combined nozzle

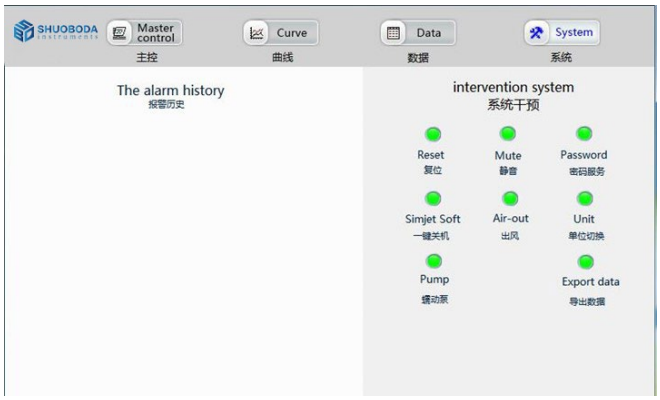
CLEAR HUMAN INTERFACE



Main interface



Curve interface

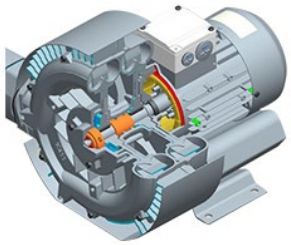


System interface

Data recorder

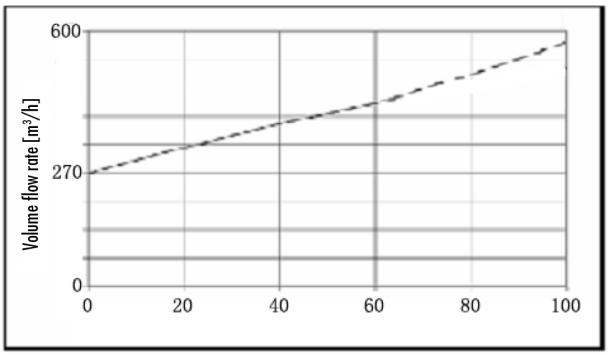
REAL FREQUENCY CONVERTER FAN

- Frequency converter fan can be great help in particles forming, product yield and processing
- Real frequency wind turbine design, Delta brand inverter

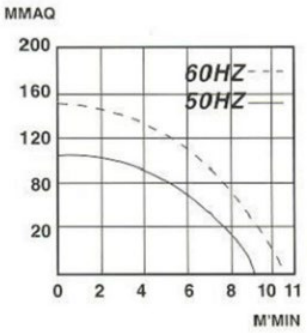


AIR SUPPLY SYSTEM

- Medium pressure blower imported from Taiwan
- Fan is the internal mechanical structure of the rotor
- The air supply system of the instrument adopts frequency conversion control to realize the stepless adjustment of the air volume, so as to meet the requirements of different process spray drying experiments.

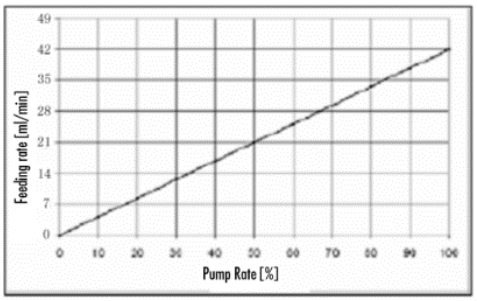


Air blower



PERISTALTIC PUMP

Peristaltic pump can be adjusted for pipes with different inner diameters and outer diameters. The diameter of the pipe is different, absolute flow is different. This relationship of the standard 19# silicone hose is shown in the diagram



FEATURES

- SPD-18A Mini spray dryer can obtain a good powder particle sample quickly and directly, and the particles are naturally spherical. It has the following remarkable performance characteristics:
- The instrument is exquisite and small, and the cabinet adopts humanized aesthetic design, and uses special spray painting technology to make the appearance of instrument more high-end;
- Heating pipes and auxiliary machinery parts are made of high strength stainless steel, high corrosion resistance and durability;
- High precision imported double fluid nozzle ensures accurate atomization performance;
- Loading and unloading is simple and fast, the operation is simple and efficient, and the whole spray drying process is carried out in the glassware, which is convenient for the operator to observe the whole experiment process;
- The control system of this equipment is based on the SIEMENS PLC and MHI touch screen. It is designed with the principle of energy saving and high efficiency making the temperature rise more quickly and stably. The temperature control accuracy is within 1°C;
- With a user-friendly window for human computer interaction, customers can fully grasp the important elements such as air flow, inlet temperature and can observe the working state of the instrument in real time, So that customers will have more actual verification space in the spray drying experiment;

- Intelligent remote host computer operation monitoring system makes the user easily complete the spray drying work in the office before the computer.

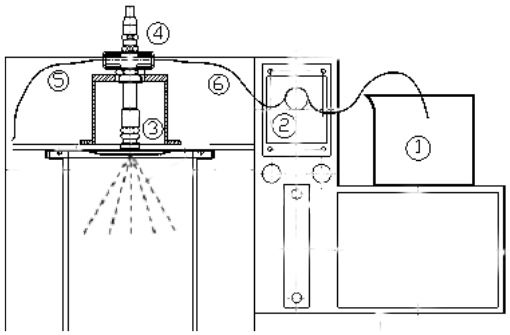
APPLICABILITY OF SPD-18A MN SPRAY DRYER

- SPD-18A small spray drying apparatus can be used for drying aqueous solution and suspension. It is suitable for the experiment and production of uniform powder. Such as: pharmaceuticals, dyes, pigments, food and beverage, milk, egg products plants and vegetable products, heat sensitive materials, plastics, polymers, resins, ceramics, perfume, soap, detergent, blood, adhesives, oxides, textiles, bone, teeth etc.
- SPD-18A is particularly applicable to the laboratory for liquid material directly into micro powder, without materials filtration, concentrating and crushing before drying, applicable for all solutions such as emulsion, suspension.

Cannot be used to deal with flammable, explosive or easy to produce large amounts of gas material. In particular, gases that are chemically unknown cannot be released.

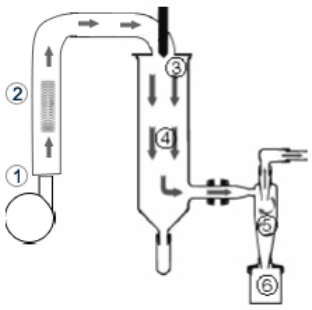
Part Instruction

Product collection



Principle of sample feeding and dispersing

① Feed material
② Peristaltic pump
③ Two fluid nozzle
④ Automatic nozzle cleaning system
⑤ Compressed air line
⑥ Feed line



The functional principle of dry air

⑦ Air inlet (Air supplied by fan)
⑧ Heating pipes and electric heaters
⑨ Concentric inlet of hot air around nozzle
⑩ Spray cylinder
⑪ Used to separate particles from a gas stream
⑫ Product collection container

SPECIFICATIONS

Model	SPD-18A
Max evaporator capacity	1800ml/h
Peristaltic pump feed rate	0 ~ 2000ml/h
Inlet air temperature	30 ~ 250°C ±1°C
Outlet air temperature	30 ~ 120°C ±1°C
Dry air flow rate	70m3/h（maximum 330m3/h）
Blower	0.2KW/220v, frequency converter fan
Electric heater	3.2KW/220V， 2520 special stainless steel
Temperature sensor	PT-100, intelligent PID control, control accuracy±1°C
Spray system	Nozzles (U.S.), 0.7mm diameter, Two-fluid nozzle (inside mix), 0.4mm/1.0mm optional
Particle size	1 ~ 25um
Avg drying time	1.0 ~ 1.5s
Automatic block discharging device	Automatic needling function, frequency adjustable 1-60s
Control system	Siemens PLC, 7" color touch LCD display
Electrical standard	Schneider
Quick release	Temperature meter, air piping and power supply
Air compressor	0.25KW, Max gas production 4.2m³/H, work pressure 2-5bar
Exhaust pipe	Diameter 51mm
Collection bottle	150ml & 450ml
Power supply	220/230V, 50 ~ 60Hz

Rate power	220V/3.6KW
Weight	58kg
Dimensions(H×W×D)	910mm×575mm×423mm

MATERIAL USED

Parts	Material Name
Glass assembly	3.3 high borosilicate glass
Nozzle/ heater	ANSI316
Sealing element	Teflon
Product feed pipe	silicon rubber
Exhaust pipe	polyurethane
Product external	Quality steel with high quality spraying

STANDARD ACCESSORIES

Item	Qty
SPD-18A spray dryer host	1 set
User's Manual	1 copy
Glass assembly	1 set
Silica gel tube	1 pc
Power cord with quick detachable head	2 meters
Compressed air pipe with quick detachable head	2 meters
Pt100 temperature sensor with quick detachable head	1 set
Sealing ring of glass tower body	1 set
External air compressor	1 set

SPARE PARTS

AC contactor	Schneider
Intermediate relay	Schneider
Air switch	CHINT
Button	Schneider
Socket	Aviation socket
solid state relay	TWITEC

OIL-FREE AIR COMPRESSOR (STANDARD FITTING FOR SPRAY DRYER)

- quality assurance. Obtained the ISO9001-2008 and ISO13485-2012 quality system certification of TUV in Germany.
- pure oil-free design. The output gas contains no oil molecules and is harmless to the human body.
- ultra-quiet. Low noise, smooth and non-fluctuating output pressure, reducing noise pollution.
- Multi-level filtration. Multi-stage gas filtration keeps the instrument cleaner and extends its life.
- internal spray rust. The inside of the gas tank is sprayed and finished to prevent the air from being rusted and contaminated.
- safe to use. Weakness, current causes the air compressor to overheat, can automatically stop the protection to avoid burnout.
- automatic start. Intermittent use, air compressor switch does not need to restart.
- pressure is adjustable. The air pressure can be adjusted to meet different equipment needs.
- durable. It is used according to regulations and has been used for more than 15,000 hours.
- Easy to operate. Power on and use without any training.
- maintenance is simple. No need to add lubricant, it is easy to use.

SPECIFICATIONS:

Voltage	220V/50Hz or 110V/60Hz
Power (W)	550W/0.75HP
Maximum displacement (L/min)	115
Amount @7bar(L/min)	40
Noise dB(A)	58
Maximum pressure (Bar)	8
Gas tank capacity (L)	22
Gross weight (KG)	25
Net weight (KG)	23
Size (L/W/H) mm	410*410*520

2. SPD-15/SPD-15A Lab Small Spray Dryer

SPD-15 Lab Spray dryer is self-contained and supplied complete and ready for immediate operation. All major components are housed within a stainless-steel cabinet and the unit can be used on a bench top or with an optional stainless-steel stand. The system was designed to be stand by a keyboard, conducted by a colorful crystal screen of touch guidance mode, and allowed two modes of run: Automatic-mode, and Eye-monitored mode for the purpose of easily controlling experimental process.

APPLICATIONS

Spray drying can be used in a wide range of applications where the production of a free-flowing powder sample is required. This technique has successfully processed materials in the following areas:

Beverages · Flavours and Colourings · Milk and Egg Products · Plant and Vegetable Extracts · Pharmaceuticals · Heat Sensitive Materials · Plastics · Polymers and Resins · Perfumes · Ceramics and Advanced Materials · Soaps and Detergents · Blood · Dyestuffs · Foodstuffs · Adhesives · Oxides · Textiles · Bones, Teeth and Tooth Amalgam and many others. Most solutions and suspensions can be spray dried providing that the resulting product has the characteristics of a solid material.

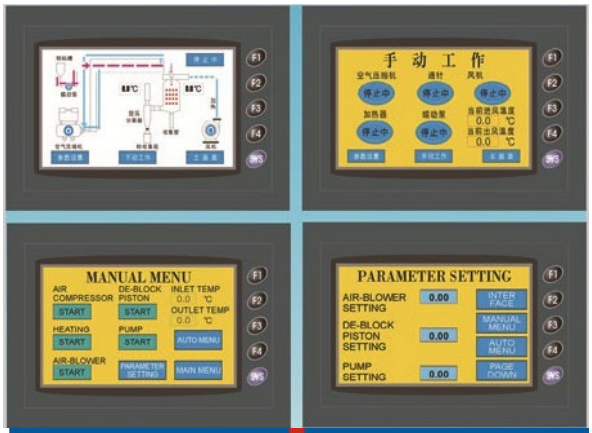
PRINCIPLE

- A menu driven microprocessor controller allows the selection of inlet temperature, airflow, automatic de-blocker frequency and pump speed. The controller features an RS 232 output for connection to a PC or data logger and software allows the control and monitoring of all functions and printing of results.
- The self-priming peristaltic pump delivers the sample liquid from a container through a small diameter jet into the main chamber. At the same time an integral compressor pumps air into the outer tube of the jet which causes the liquid to emerge as a fine atomised spray into the drying chamber.
- Heated air is blown through the main chamber evaporating the liquid content of the atomised spray. The solid particles of the material, which are normally in a free flowing state, are then separated from the exhaust air flow by a cyclone and collected in the sample collection bottle. The exhaust airflow is directed through a flexible 60 mm diameter hose direct to atmosphere or to an existing extraction system.

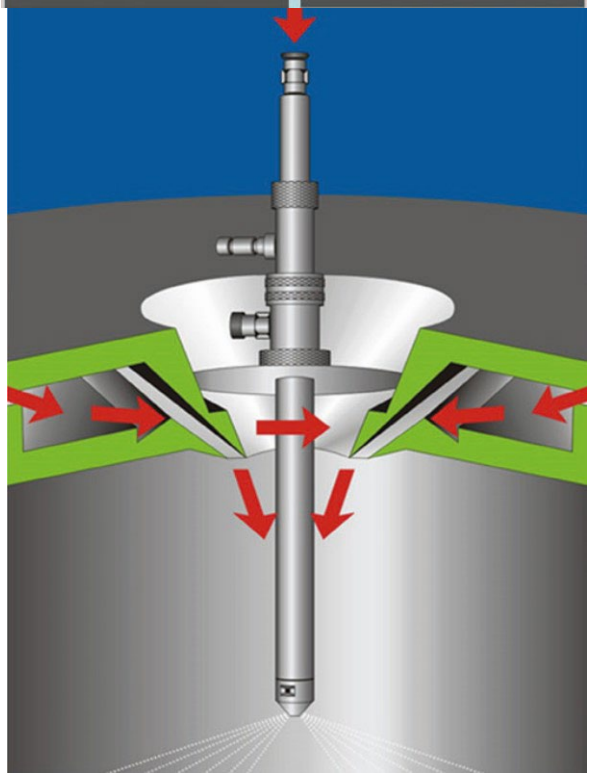
SPD-15A



ADVANTAGES



- Two modes of run: Automatic-mode, and Eye-monitored mode for the purpose of easily controlling experimental process . PLC controller, LCD touch panel control fascia with flow path of system. Using proface touchable interface display operation, operator can control temperature, airflow volume, air pressure, pump speed and de-blocker frequency.
- Spray chamber, cyclone separator, receiving tank are all made of Borosilicate glass which can resist strong acid/alk li, high temperature. It can work in a no-pollution and stable environment, and the whole process can be inspected. All the spare parts are easy to install and wash.
- Made of SUS-316 Stainless steel. Easy operating.
- To assure accurate temperature control and easy parameter adjusting, SPD-15 applies PID.
- A filter has been equipped to the inlet unit to prevent the sample from contamination .
- The self-priming peristaltic pump delivers the sample liquid from a container through a small diameter jet into the main chamber to avoid secondary pollution.. To make sure the process conducted steady and smoothly, magnetic agitator is optional to make the solution well mixed.
- Narrow size distribution of particles.
- Automatic de-blocking device prevents the nozzle fro m becoming blocked and variably controlled
- The air compressor is no oil and don't pollute compress air. The power from receiving tank has a good flow. The sound is low than 60db, and following the GMP understands.
- Supplied complete and ready for most spray drying applications.
- Automatic de-blocking device prevents the nozzle from becoming blocked and variably controlled.
- Equipped with air filter to remove and collect fine particle s in exhausted air.
- **Can be used for organic & water solvents (Model SPD-15A)**



TECHNACL INFORMATION

Model	SPD-15	SPD-15A
Material for drying	Water-base	Organic solutions With nitrogen circulation system and online recovery system
Power	3kw	6kw
Heating power	3kw	3.5kw
Air flow	3~6m3/min	1~3m3/min
Inlet/outlet filters	Optional (HEPA)	N2
Dehumidifier	No	Yes
Control	PID Automatic or manual dual control	
Display	LCD touch display can show Inlet temperature / outlet temperature / peristaltic pump speed / wind / through needle frequency	
Inlet air temperature range	30°C to 300°C	
Outlet air temperature range	30°C to 120°C	
Evaporate water capacity	1500mL/h	
Particle diameter range	1-25um	
Drying time	1.0~1.5s	
Temp. Precision	±1 °C, real time PID control	
Max. Sample feed	2000mL/H	
Min. Sample feed	30mL/H	
Weight	110kg	
Dimensions	650×500×1550mm (W*D*H)	
Packing size & weights	990×790×1480 mm/ 168KG, 660×430×610 mm/ 23kg (main-chamber/cyclone/sample collection bottle/waste collection tube) (2 packages)	
obturating ring	50 pcs	
Nozzle diameter	Can be chosen from 0.5mm/0.7mm/0.75mm/1.0mm/1.5mm/2.0mm	
Nozzle material	SS316 stainless steel	
Atomizer material	SS316 stainless steel	
Power supply	220V/50Hz or 110V/60Hz	

SPECIFICATION OF NITROGEN FOR SPD-15A SPRAY DRYER

Item	Specification
Pressure	1~4 bar
Flow rate	2m3/min
Consumable	6~8 hours/40L
Purity	99.99%

MAIN COMPONENTS

Items	Standard	Remarks
Air Compressor	4.2 m3/H, internally installed	Hanjin (Korea)
SELF-PRIMING PERISTALTIC PUMP	1500ml/H	RS (France)

Peristaltic Pump Head		RS (France)
PLC		ELT (Taiwan)
touch screen	180*140mm	ELT (Taiwan)
transducer		ELT (Taiwan)
AIR-BLOWER	6.5M3/min	PDX(Taiwan)
thermal-protective elbow	140mm	stainless steel & High temperature resistant material (1700°C)
exhaus adapter	50mm	stainless steel
THERMOCOUPLE	M8x1.25	
MAIN-CHAMBER	140mm	PYREX
CYCLONE	85 mm	PYREX
NOZZLE	0.7mm	
silicone rubber tube	ϕ8xϕ5	resist heat， 2M

3. SPD-500/SPD-501 Laboratory Mini Bench-top Spray Dryer, stainless steel type

ON-TABLE MODEL

The instrument can be placed on the experiment table, or SHUOBODA inert loop system SPD-501, featuring small size and convenient operation;

FOR AQUEOUS SOLUTION AND ORGANIC SOLVENT

SPD-500 laboratory spray dryer has the basic type and the organic solvent type SPD-501 (with inert loop system). SPD-500 laboratory spray dryer is for aqueous solution, which can simply be updated to organic solvent type after equipped with SPD-501 inert loop system;

HOMOCENTRIC SPRAY ATOMIZER

During experiments, the new spray atomizer would never be off-center in atomization, and there won't be affected recovery rate by spraying on the bottle wall. The spray atomizer can change the spray site to improve the spray effect by moving up and down; notably, the spray atomizer has excellent adaptability to material with high viscosity and few blocking situation;

THE EXHAUST AIR IS DISCHARGED AFTER RECOVERY IN THE BAG FILTER

SPD-500 laboratory spray dryer standard tail gas dedusting equipment can reduce environmental pollution while effectively improving the yield, especially the yield of difficult recycle;

CONTROLS & FUNCTIONALITY

SPD-500 laboratory spray dryer is designed to ensure that all functions are simple to select and adjust, to quickly achieve the optimum conditions for spray drying. The operator can control the following functions:

Inlet Temperature
Gasflow Volume
Pump Speed
De-blocker Frequency

EASY TO USE

PLC automatic control, One-click boot.
Color Touch Screen, Fast setup and cleaning times
Scale up to pilot or industrial scale possible.
Visible process due to glass assembly
Adjustable particle size (1 – 25 microns)

TWO FLUID NOZZLE WITH SUS316L STAINLESS STEEL

The stainless-steel spray assembly consists of an inner tube for the liquid sample leading to a small diameter jet. An outer tube directs compressed air to the nozzle. All units are supplied with 0.7mm jets, other sizes are available as accessories. The spray assembly incorporates an automatic de-blocking device that prevents the jet nozzle from becoming blocked, the de-blocking needle is activated by an integral compressor. De-blocking is sometimes necessary with materials which may solidify or when large particles in suspension cause blockages in the jet.

Trusted by the users Over 1,500 customers of top universities, enterprises and research institutes use our mini spray dryer. And exported to more than 40 countries & regions such as the United States, Italy, South Korea, Mexico, Singapore, Canada, Malaysia, Chile and Russia.



AREAS OF APPLICATION

SPD-500 laboratory spray dryer can be used in a wide range of applications where the production of a free-flowing powder sample is required.This technique has successfully processed materials in the following areas:

- Beverages · Flavours & Colourings
- Milk & Egg Products · Plant & Vegetable Extracts
- Pharmaceuticals · Heat Sensitive Materials
- Plastics · Polymers and Resins · Perfumes
- Ceramics & Advanced Materials
- Soaps & Detergents · Blood · Dyestuffs
- Foodstuffs · Adhesives · Oxides ·Textiles
- Bones, Teeth & Tooth Amalgam and many others


SPECIFICATIONS:

Model	SPD-500 lab spray dryer

Power	1500W
Voltage	220V, 50-60HZ
Min. Outlet Temp.	80°C
Evaporating Capacity	500ml/h
Airflow	0~330m3/h
Max. Inlet Temp	200°C
Heater power	1000W
Temp. precision	±1°C
Nizzle jet	0.7mm standard/(0.5/0.75/1.0/1.5/2.0mm available)
Nozzle type	Two fluid nozzle
Possible particle size range	1~25μm
Mean Residence Time	1~1.5 second
Operation mode	Automatic / Manual
Minimum Sample Volume	20ml
Spray Chamber Material	SUS304 Stainless Steel
Cyclone Separator Material	SUS304 Stainless Steel
Receiving Tank Material	SUS304 Stainless Steel
Body Material	SUS304 Stainless Steel
Seal of Cyclone/cylinder	Silicone
Gas type	Compressed Air(for aqueous)
Dimension	800*550*900mm
Weight	80KG
Display	7-Inch LCD display for Heat, Spray, Pump, Air pressure, de-blocker frequency
Thermal Protection	Blower does not stop until temp <90°C
Deblocking	Automatic

Model	SPD-501 lab spray dryer (with Inert Loop system for organic solvent)
Power	2500W
Voltage	220V,50/60 Hz
Atomizer material	SUS 316 Stainless steel
Evaporating Capacity	500ml/h for water
Airflow	0-330 m³/h
max. Input temperature	200 °C
Heater power	1000W
Temperature precision	±1 °C
Spray gas	4.2m³/h, 2-5bar
Nozzle jet	0.7mm standard/(0.5/0.75/1.0/1.5/2.0mm available)
Nozzle type	Two fluid nozzle
Possible particle size range	1-25μm
Mean Residence time	1.0-1.5 sec
Operation mode	Automatic/Manual
Max. Sample feed	1500ml/hr
Minimum sample volume	30ml
Spray chamber material	SUS304 Stainless steel
Cyclone separator material	SUS304 Stainless steel

Receiving tank material	SUS304 Stainless steel
Body material	SUS304 Stainless steel
Seal of cyclone/cylinder	Silicone
Gas type	N2 (for solvent) or compressed air (for aqueous)
Sound	<60db
Dimensions	800*550*900 (spray dryer) 900*800*900(inert loop)
Weight	150KG
Display	7-Inch LCD display for Heat, Spray, Pump, Air pressure, de-blocker frequency
Thermal protection	Blower does not stop until temp <90 °C
Deblocking	Automatic
Inert loop (for organic solvents)	Yes

4. SPD-6000 Series Lab Small Spray Dryer

DESCRIPTION

Miniature experimental micro spray dryer(spray dryer / spray dryer) and its main application in the laboratories of universities, research institutes and food pharmaceutical and chemical enterprises to produce micro particle powder, which is widely applicable to all solutions such as emulsions and suspensions, and is suitable for drying of heat sensitive substances, such as biological products, biological pesticides, enzyme preparations, etc. The material is heated only when it is sprayed into foggy particles, so it is only instantaneously heated to keep the active ingredients of these materials intact after drying.

MAIN CHARACTERISTIC

- Color LCD touch screen parameter display: air inlet temperature / air outlet temperature / peristaltic pump speed / air volume / pass needle frequency.
- Fully automatic control: One-click start-up, after setting spraying process parameters, the temperature reaches a predetermined temperature, the peristaltic pump starts automatically, the running animation is displayed on the touch screen, and the running process is clearly displayed; when the machine is shut down, just press the stop button, and the machine will automatically shut down safely.
- Manual control: If the process parameters need to be adjusted during the experiment, it can be easily switched to the manual state. The color touch screen is dynamically displayed (animated) throughout the experiment
- Equipped with nozzle cleaner (through needle), when the nozzle is blocked, it will be automatically cleared, and the frequency of through needle can be adjusted automatically.
- Shutdown protection function: Just press the stop button when shutting down, the machine will stop running immediately except the fan, to ensure that the equipment will not burn out due to misoperation (forced shutdown of the fan).
- The spraying, drying and collecting system is made of transparent high-quality high-borosilicate heat-resistant glass material, so that the drying process is performed in a pollution-free environment.
- Built-in imported oil-free air compressor, the particle diameter of the powder spray is normally distributed, the fluidity is very good, and the noise is very low, less than 60db.
- The atomizing structure of the two-fluid spray, the whole machine is made of high-quality stainless steel, and the design is compact without the need for auxiliary equipment.
- The design of drying temperature control uses real-time control PID constant temperature control technology to make the temperature control in the whole temperature area accurate, and the heating temperature control accuracy is ± 1 ℃.
- In order to maintain the purity of the sample, an air inlet filter is equipped.
- The feed volume can be adjusted by the feed peristaltic pump, and the minimum sample volume can reach 50ml.
- The particle size of the finished dry powder is relatively uniform, and more than 95% of the dry powder is in the same particle size range.

- For viscous materials, a nozzle cleaner (through needle) is provided. When the nozzle is blocked, it will be automatically cleared and the frequency of the through needle can be adjusted automatically.
- Innovative tower wall purging device, higher material recovery rate.

TECHNICAL PARAMETERS

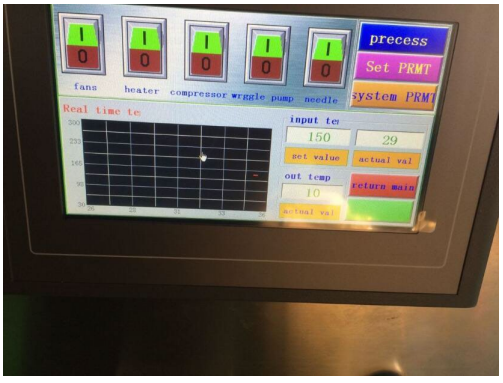
Model	SPD-6000G	SPD-6000S	SPD-6000N
Chamber material	High borosilicate glass	Stainless steel	High borosilicate glass
picture			
Water evaporation	1500ml	1500ml	1500ml
Minimum feed quantity	80ml	80ml	80ml
Drying chamber diameter (mm)	¢ 300	¢ 300	¢ 300
Maximum intake temperature	~250 C (adjustable)	~250 C (adjustable)	~250 C (adjustable)
Hot air condition	Air supply	Air supply	Suction
Heater capacity	3kw	3kw	3kw
Blower [power (kw), air volume (m/min)]	[0.25,9.5]	[0.25,9.5]	[0.25,9.5]
Compressor [power (kw), air volume (L/min)]	[0.58, 108]	[0.58, 108]	[0.58, 108]
Electric power (kw)	4kw	4kw	4kw
Outline size (mm) (l× w× h)	800× 600× 1300	800× 600× 1300	900× 600× 1300
Bag filter	N/A	N/A	Yes
Installation weight (Reference)	90kg	90kg	100kg
Power supply	220V/50Hz		220V/50Hz

5. SPD-8000 Lab Spray Dryer, 2L/h, water-based solution

SHUOBODA SPD-8000 Spray dryer is mainly used in the production of micro-particle powder in universities, research institutes and food and pharmaceutical chemical enterprises. It has broad-spectrum applicability to all solutions such as emulsions and suspensions. It is suitable for drying sensitive substances such as biological products. Biological pesticides, enzyme preparations, etc., because the materials sprayed are only subjected to high temperature when sprayed into mist-sized particles, so they are only heated instantaneously, and the active materials can be kept from being damaged after drying.

FEATURES

- It adopts large-color touch screen operation, automatic control and manual control, ten-stage program temperature control, and its own memory function, which is the only one in China.
- Full-automatic control: one-button start-up, after setting the spray process parameters, the temperature reaches the predetermined temperature, the peristaltic pump starts itself, the running animation is displayed on the touch screen, and the running process is clearly displayed; when the machine is shut down, just press the stop button, the machine is automatically safe. Shut down.
- Manual control: If the process parameters need to be adjusted during the experiment, it is convenient to switch to the manual state. The color touch screen is dynamically displayed (animation) throughout the experiment.
- Shutdown protection function: Just press the stop button when shutting down, the machine will stop running immediately except the fan, to ensure that the equipment will not burn out due to misoperation (forced off the fan).
- The spray, drying and collection system is made of high-quality stainless steel material, which makes the spray drying process in a non-polluting and stable environment, which provides great convenience for researchers to control the experimental process and experimental results. All stainless steel components are easy to disassemble and easy to clean.
- The organic solvent spray dryer has built-in imported oil-free air compressor. The particle diameter of the powder spray is normally distributed, the fluidity is very good, and the noise i s very low, less than 60db, in line with the national laboratory noise standard;
- The atomization structure of the two-fluid spray, the whole machine is made of high-quality stainless-steel material with precision design, compact design, no need for auxiliary equipment, convenient to use, and lasts for a long time.



- In order to meet the requirements of the user to adjust various parameters in the experimental range, the real-time regulation PID constant temperature control technology is adopted in the design of the drying temperature control, so that the temperature control in the full temperature zone is accurate, and the heating temperature control precision is ±1 °C.
- In order to keep the sample clean, an air inlet filter is provided.
- The feed amount can be adjusted by the feed peristaltic pump, and the minimum sample volume can reach 10ml.
- Dry powder after drying, the particle size is relatively uniform, and more than 95% of the dry powder is in the same particle size range.

- The small spray dryer is equipped with a nozzle cleaner (passing needle) for the viscous material. When the nozzle is blocked, it will be automatically cleared, and the frequency of the needle can be automatically adjusted.
- Innovative tower wall purging device with higher material recovery rate.
- Automatic cleaning function, greatly enhancing the dry sample recovery rate.
- The automatic cleaning function of the drying tower eliminates the need for manual cleaning, which greatly saves the experiment time.

SPECIFICATIONS

Model	SPD-8000S	SPD-8000G
Chamber material	Full stainless steel	High borosilicate glass
Picture		
Control	Fully automatic control and manual control dual control mode, color touch screen dynamic display (animation) throughout the experiment	
Inlet air temperature control	30 ° C ~ 400 ° C	
Outlet temperature control	30 ° C ~ 200 ° C	
Evaporation water volume	50mL/H～ 2200ml/h	
Maximum feed amount	peristaltic pump adjustable up to 2200ml / h	
Minimum amount of feed	50mL	
Temperature control accuracy	±0.5°C, Real-time PID temperature control technology, real-time online display of inlet air temperature and outlet temperature	
Drying time	0.8 ~ 1.0S	
With shutdown protection function	just press the stop button when shutting down, the machine will stop running immediately except the fan to ensure that the equipment will not burn out due to mis operation (forced off the fan).	
Color LCD touch screen parameter	air inlet temperature / air outlet temperature / peristaltic pump speed / air volume	

display	/ needle frequency
Nozzle diameter	0.5mm/0.75mm/1.0mm/1.5mm/2.0mm optional, and can be customized according to requirements
Time setting function	the user can set the working time of the machine by himself, without manual guarding, the working time ends the machine to stop working, no need to manually guard, which greatly saves the precious time for the customer to do the experiment.
Automatic fan stop function	After the instrument is finished, the working state of the fan should be kept, so that the glass is partially cooled. The machine is set by intelligent program. When the inlet temperature is lower than 30 degrees, the fan is automatically turned off, and there is no need to manually turn off the fan manually.
Powder particle size requirements	dry powder after drying, the particle size is more uniform, more than 95% of the dry powder in the same particle size range
machine power	2-3.0KW/Single phase 220V
Spray head cooling device	(optional)
Equipment size	1380 (H) × 770 (L) × 590 (W) mm
Outer packaging size	1500 (H) × 910 (L) × 730 (W) mm
Package weight	90KG

NOTE

- Can be upgraded to a two-stage separation and collection system
- There is a nozzle cleaner (needle blocking), which will automatically clear when the nozzle is blocked, and the frequency of the needle can be adjusted automatically.
- The spray dryer is made of stainless steel, the atomization structure of the two-fluid spray, the spray, drying and collection system is made of transparent high-quality borosilicate heat-resistant glass material.
- Built-in imported oil-free air compressor, the particle diameter of the powder is normally distributed, the fluidity is good, and the noise is very low, in line with the national laboratory noise standard;
- Intelligent control system, replacing the PLC control on the market, the stability is stronger
- The machine has the function of mis operation protection. When the order of the fan and heater switch is wrong, the machine automatically reminds you to prevent the novice from mishandling the machine.
- Tower wall purging device, material yield is higher
- Can be directly upgraded to a nitrogen circulation system for drying organic solvent materials

SPARE PARTS:

Item Name	Qty
Small spray dryer SPD-8000	1 set
Air compressor (built-in)	1 set
LCD screen MCGS(built-in)	1 pc
Fan RB022 (built-in)	1 set
Stainless steel drying room	1 set
Stainless steel cyclone separator	1 set
Stainless steel sample collection bottle 500ML	1pc
Stainless steel sample collection cold trap	1pc
Medical grade feed tube	1.5 m
Imported atomizer (0.5/0.75/1.0/1.5/2.0mm optional)	1 pc
Clamp LY12	1 set
Polytetrafluoroethylene gasket	1 piece

6. SPD-18/SPD-1800A Pilot Spray Dryer for Large Particle, water-based or organic solvent can be processed

SPD-18 mini spray dryer is self-contained and supplied complete and ready for immediate operation. All major components are housed within a stainless-steel cabinet and the unit can be used on a bench top or with an optional stainless-steel stand. The system was designed to be stand by a keyboard, conducted by a colorful crystal screen of touch guidance mode, and allowed two modes of run: Automatic-mode, and Eye-monitored mode for the purpose of easily controlling experimental process.

SPD-18 MIN SPRAY APPLICATIONS

SPD-18 mini spray dryer can be used in a wide range of applications where the production of a free-flowing powder sample（10-120μm） is required. This technique has successfully processed materials in the following areas:
Beverages · Flavours and Colourings · Milk and Egg Products · Plant and Vegetable Extracts · Pharmaceuticals · Heat Sensitive Materials · Plastics · Polymers and Resins · Perfumes · Ceramics and Advanced Materials ·
Soaps and Detergents · Blood · Dyestuffs · Foodstuffs · Adhesives · Oxides · Textiles · Bones, Teeth and Tooth Amalgam and many others. Most solutions and suspensions can be spray dried providing that the resulting product has the characteristics of a solid material.

SPD-18 MIN SPRAY DRYER TECHNQUE

1. A menu driven microprocessor controller allows the selection of inlet temperature, airflow, automatic de-blocker frequency and pump speed. The controller features an USB output for connection to a PC or datalogger and software allows the control and monitoring of all functions and printing of results(optional).

2. The self-priming peristaltic pump delivers the sample liquid from a container through a small diameter jet into the main chamber. At the same time an integral compressor pumps air into the outer tube of the jet which causes the liquid to emerge as a fine atomized spray into the drying chamber.
3. Heated air is blown through the main chamber evaporating the liquid content of the atomized spray. The solid particles of the material, which are normally in a free-flowing state, are then separated from the exhaust air flow by a cyclone and collected in the sample collection bottle. The exhaust airflow is directed through a flexible 60 mm diameter hose direct to atmosphere or to an existing extraction system.

ADVANTAGES

1. Two modes of run: Automatic-mode, and Eye-monitored mode for the purpose of easily controlling experimental process . PLC controller, LCD touch panel control fascia with flow path of system.
2. air oilless compressor, the sound is low than 60db
3. Made of SUS-316 Stainless steel. Easy operating.
4. To assure accurate temperature control and easy parameter adjusting, SPD-15 applies PID.
5. The self-priming peristaltic pump delivers the sample liquid from a container through a small diameter jet into the main chamber to avoid secondary pollution. To make sure the process conducted steady and smoothly, magnetic agitator is optional to make the solution well mixed.
6. Narrow size distribution of particles. （10-100um）
7. Automatic de-blocking device prevents the nozzle from becoming blocked and variably controlled

TECHNACL INFORMATION

Parameter	SPD-18 Spray Dryer for water-based solvent (Upgraded model SPD-1800A with inert loop for organic solvent)
Power	5500W
Voltage	220V,50/60 Hz
Atomizer material	SUS 316 Stainless steel
Evaporating Capacity	4 l/h for water
Airflow	0-330 m³/h
max. Input temperature	350°C
Heater power	5000W
Temperature precision	±1°C
Spray gas	4.2m³/h, 2-5bar
Nozzle jet	0.7mm standard/(0.5/0.75/1.0/1.5/2.0mm available)
Nozzle type	Two fluid nozzle
Possible particle size range	5-100μm

Mean Residence time	1.0-1.5 sec
Operation mode	Automatic/Manual
Max. Sample feed	5000ml/hr
Minimum sample volume	100ml
Spray chamber material	SUS 304 stainless steel
Cyclone separator material	SUS 304 stainless steel
Receiving tank material	SUS 304 stainless steel
Body material	SUS304 Stainless steel
Seal of cyclone/cylinder	Silicone
Deblocking	Automatic
Sound	<60db
Dimensions	950*750*1700
Weight	150KG
Display	7-Inch LCD display for Heat, Spray, Pump, Air pressure, de-blocker frequency
Thermal protection	Blower does not stop until temp <90°C
Inert loop (for organic solvents)	Optional (SPD-1800A)

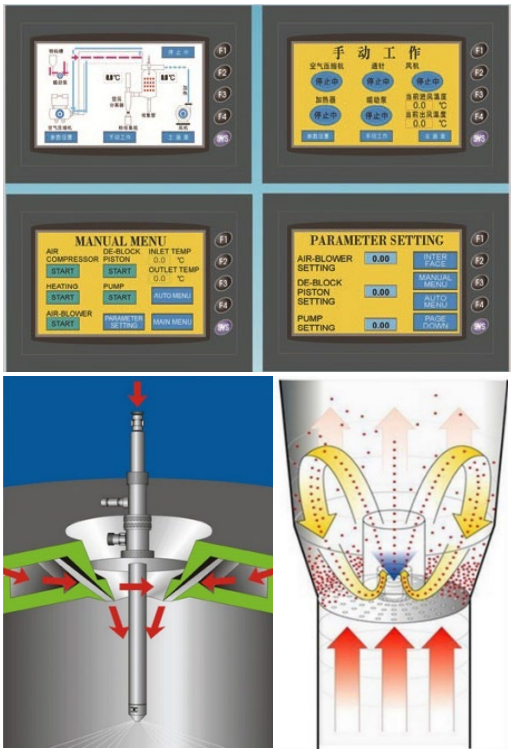
7. SPD-1000 Coating & Granulator Spray Dryer

WHAT CAN SPD-1000 LAB SPRAY GRANULATOR DO?

- Spray dryer:1500ml/inlet temperature 105°C -200°C
- Spray granulator: Batch size from 50 g up to 1000 g
- Coating: Batch size from 50 g up to 1000 g
- Mixing: Batch size from 50 g up to 1000 g
- Fluidized bed dryer: Batch size from 50 g up to 1000 g
- Designed for trials with small-scale processes especially in R&D as well as Universities

SPD-1000 LAB SPRAY GRANULATOR FEATURES

- Less occupied area:1 square meter is enough to place.
- Low power consumption, environmental protection and easy operating.
- Suitable for heat-sensitive materials and samples of easy dissolving particulates.
- PLC operation control. LCD touch screen displays the whole experimental process.
- Shutdown protection: press the stop button and the machine (except the fan) stops working immediately so that heating parts will not be burnt due to misuse (forced shutdown of the fan).
- Stainless steel machine body and two-fluid spray atomization structure made of SUS 316 stainless steel.
- Real-time control on PID temperature.



APPLICATION SCOPE:

Pharmaceutical product/food and feed/ceramic product/plastic and rubber/polymer and resin/ biogenetic product/chemicals and fertilizer/ perfume/ coloring matter and dye/vegetable and fruit extract/ aromatic substance/grain crop, etc.

APPLICATION AREA:

Spray dehydration and micronization, microencapsulation, restoration of product composition and extraction, suspending liquid dehydration, particle size control and structure revision

SPD-1000 LAB SPRAY GRANULATOR PARAMETER

Model	SPD-1000 spray granulator
Function	Spray dryer, spray granulator,coating,mixing
Power	5KW,220V,50/60Hz
Spray granulator capacity	Max. 1000g/batch
Spray dryer capacity	Max. 1500ml/h
Max particle size	500 Micron
Minimum sample volume	50g
Fluidized inlet air temperature	40-150°c
Spray dryer inlet temp.	105-200°c
Atomizing pressure	0.15-4 bar
Air compression pressure	0.15Mpa~0.6Mpa
Air compression consumption	≤ 4m3/h
Temperature precision	±1°c
Coating	50-1000g/batch
Mixing	50-1000g/batch
Nozzle type	Two fluid nozzle
Nozzle jet	0.7mm standard/(0.5/0.75/1.0/1.5/2.0mm available)

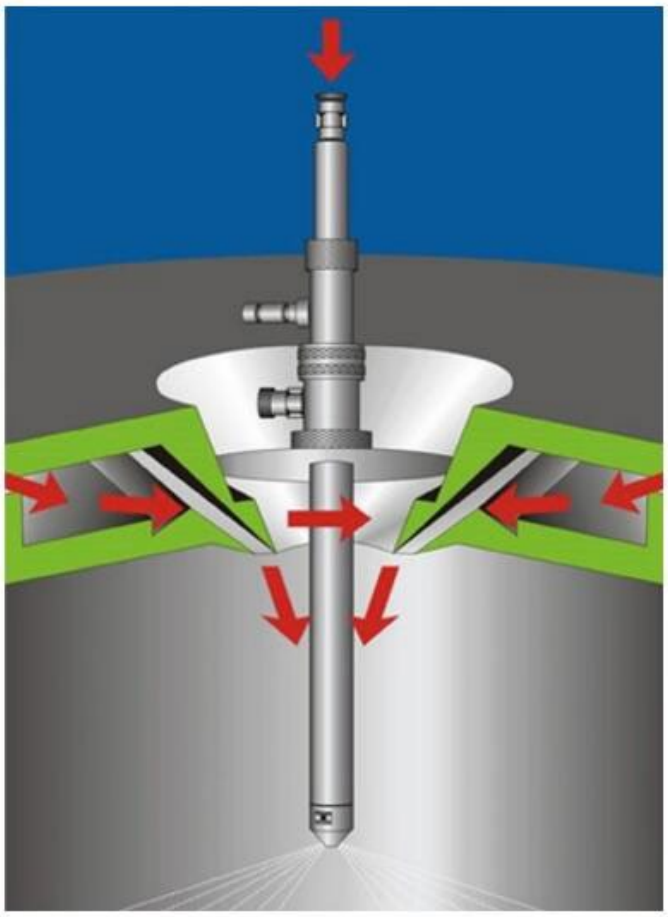
Fluidized inlet air flow speed	0-150m3/h
Peristaltic pump flow	100-1500ml/h , adjustable
Expansion chamber volume	10L
Heater power	3.5KW
Fan power	1.5KW
Expansion chamber material	SUS304 Stainless steel &High borosilicate glass
Body material	SUS304 Stainless steel
Seal of cyclone/cylinder	Silicone
Sound	<60db
Dimensions	900*800*1300mm
Weight	110KG
Operation mode	Automatic/Manual
Display	7" LCD for Heat, Spray, Pump, Air pressure, de-blocker frequency

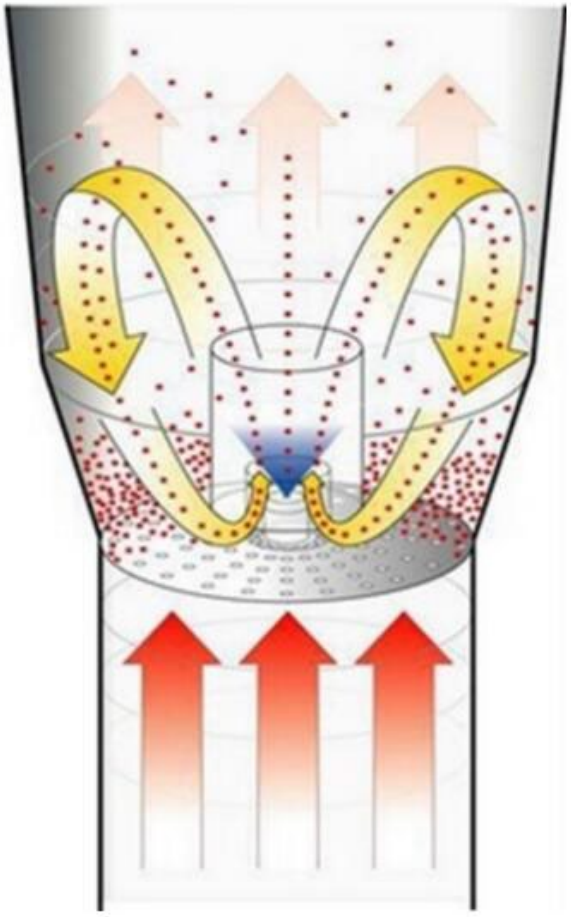
8. SPD-1800F Low Temperature Lab Spray Dryer

SPD-1800F laboratory low-temperature spray dryer is a breakthrough made by us with efforts in spray drying technology. SPD-1800F can extract natural product and juice from traditional medicine (herbal medicine) in laboratory and get powder particles of excellent liquidity at a low temperature of 110°C with a high yield. In particular, it achieves rapid material drying at low temperature and provides very convenient and safe drying method for thermo-sensitive materials, such as biological product, high carbohydrate traditional Chinese medicine natural product extract, thermolabile polymer material, heat gasification material and so on.

FEATURES

- Entire spray drying experimental process can be completed in 110 ° C, greatly reduces the temperature of drying to solve the problems for spray drying of heat-sensitive materials.
- Color touch-screen operation: PID temperature control heating temperature, heating accuracy reach ±1 °C., peristaltic pump feed rate can be adjusted at any time.
- Particle diameter of powder in normal distribution, good liquidity with low noise, in line with laboratories noise standards;
- Structure of two-fluid atomizer spray, made of high-quality stainless-steel materials, precision manufacturing, compact design without ancillary equipment, easy to use.
- Feed rate can be adjusted by feeding peristaltic pump, rated capacity 1800mL/h
- Spray head located in the middle of the drying chamber, can be dry in concurrent or counter-current way, can lengthen or shorten drying time according to the material characteristics, suitable for heat-sensitive materials.
- With the function of the fluidized bed;
- Can be equipped with 1-micron precision filter, effectively improve the efficiency.





SPECIFICATIONS:

Model	SPD-1800F
Power	4000W
Voltage	220V
Frequency	50/60 Hz
Evaporating Capacity	1500ml/h for water
Airflow	0-330 M3/h
Max. Inlet temperature	200℃
Heating power	3500W
Temperature precision	±1℃
Compressed air	4.2M3/h, 2-5bar
Nozzle jet	0.7mm standard/(0.5/0.75/1.0/1.5/2.0mm available)
Nozzle type	Two fluid nozzle

Possible particle size range	1-25μm
Mean Residence time	1.0-1.5 sec
Operation mode	Automatic/Manual
Max. Sample feed	1800ml/hr
Minimum sample volume	30ml
Seal of cyclone/cylinder	Silicone
Inlet temperature	105~200℃
Cyclone separator material	SUS-304 Stainless steel
Body material	SUS-304 Stainless steel
Spray chamber material	SUS-304 Stainless steel & borosilicate glass
collection bottle material	SUS-304 Stainless steel
Sound	<60db
Dimensions	1100*1000*1200mm
Weight	115KG
Display	7-Inch LCD display for Heat, Spray, Pump, Air pressure, de-blocker frequency
Thermal protection	Blower does not stop until temp <90℃
Deblocking	Automatic
Atomizer material	SUS 316 Stainless steel

9. SPD-2000 Series Vacuum Spray Dryer

WHY NEED VACUUM SPRAY DRYER?

The rapid drying of heat-sensitive material has been troubling plenty of researchers. Common vacuum drying and spray drying cause great damage to biological activity or structure of material. Freeze drying has disadvantages such as long drying time and low energy efficiency. Moreover, the material after freeze drying is lumpy and needs to be smashed a second time.

WHAT CAN VACUUM SPRAY DRYER DO?

Our company after long-term communication with researchers, realizes that low-temperature spray drying is able to solve the problems of drying of heat-sensitive material effectively. Therefore, we developed the SPD-2000 low-temperature spray dryer for laboratory. The dryer not only inherits many advantages of SPD-15 mini spray dryer, but also integrates the merits of vacuum drying creatively. It is capable of drying material rapidly (1 second) when the temperature of inlet air is around 50°C. The damage to activity or structure of material during drying is completely prevented. It is a convenient and safe method for drying heat-sensitive material, such as biological products (e.g. enzyme preparation and viable bacteria), extract of natural product from traditional Chinese medicine with high sugar content, heat-labile high polymer material, and material that gasifies when contacting with heat.

CONTROLS & FUNCTIONALITY

SPD-2000 vacuum spray dryer is designed to ensure that all functions are simple to select and adjust, to quickly achieve the optimum conditions for spray drying. Both use a clear touch screen display , the operator can control the following functions:

- Inlet Temperature
- Airflow Volume
- Air compressor flow
- Pump Speed
- De-blocker Frequency

EASY TO USE

- Color Touch Screen, Fast setup and cleaning times
- Scale up to pilot or industrial scale possible.
- Visible process due to glass assembly
- Adjustable particle size (1 – 100 microns)

TWO FLUID NOZZLE WITH SUS316L STAINLESS STEEL

The stainless-steel spray assembly consists of an inner tube for the liquid sample leading to a small diameter jet. An outer tube directs compressed air to the nozzle. All units are supplied with 0.7mm jets, other sizes are available as accessories. The spray assembly incorporates an automatic de-blocking device that prevents the jet nozzle from becoming blocked, the de-blocking needle is activated by an integral compressor. De-blocker is sometimes necessary with materials which may solidify or when large particles in suspension cause blockages in the jet.

Temperature protection

The heater has an extreme high temperature when experiment finished, which needs air blower to continue working in order to reduce the inside temperature and ensure the safety of equipment, SPD-2000 spray dryer can control air blower running automatically, even the operator wants to turn off the air blower, the system would prevent the operator until the temperature of system reduce to the default security state of system;

SUS 304 stainless steel

Spray chamber, cyclone separator, collector is all made of SUS 304 stainless steel. It can work in a no-pollution and stable environment, and sight glass equipped so the whole process can be inspected. All the spare parts are easy to install and clean.

Trusted by the users

Over 1,500 domestic customers of top universities, enterprises and research institutes use our mini spray dryer. And exported to more than 40 countries & regions such as the United States, Italy, South Korea, Mexico, Singapore, Canada, Malaysia, Chile and Russia etc.

WIDE RANGE OF APPLICATIONS

SPD-2000 vacuum spray dryer can be used in a wide range of applications where the production of a free-flowing powder sample is required. This technique has successfully processed materials in the following areas:

- Oxide • Blood • Polymers and Resins
- Beverages • Flavours & Colourings
- Milk & Egg Products • Plant & Vegetable Extracts
- Pharmaceuticals • Heat Sensitive Materials
- Plastics • Perfumes • Dyestuffs
- Ceramics & Advanced Materials

- Soaps & Detergents · Textiles
- Foodstuffs · Adhesives
- Bones, Teeth & Tooth Amalgam and many others

SPECIFICATIONS:

Model	SPD-2000	SPD-2000A
Material	External SS304 and material contact part SS316, two-fluid spray atomization structure, with the movable roller	External SS304 and material contact part SS316, two-fluid spray atomization structure, with the movable roller
Inlet air temperature control	50 ~ 150 ° C	50 ~ 150 ° C
Process capacity	1.5L/h	3L/h
Nozzle cleaner	with a nozzle cleaner (needle deblock), will automatically clear when the nozzle is blocked, the frequency of the needle can be automatically adjusted;	with a nozzle cleaner (needle deblock), will automatically clear when the nozzle is blocked, the frequency of the needle can be automatically adjusted;
Minimum sample size	50mL (depending on the difference in solid content of materials)	50mL (depending on the difference in solid content of materials)
Temperature control accuracy	± 1 ° C, real-time regulation of PID constant temperature control technology,	±1 ° C, real-time regulation of PID constant temperature control technology,
Nozzle diameter	0.5mm, 0.7mm, 1mm, 1.5mm, 2mm optional, and can be customized according to customer requirements;	0.5mm, 0.7mm, 1mm, 1.5mm, 2mm optional, and can be customized according to customer requirements;
Machine power	6KW380V 50HZ	9KW380V 50HZ
Instant spray drying temperature	low temperature (50 ° C)	low temperature (50 ° C)
Powder size	1~25um	1~100um
Degree of vacuum	-0.03 ~ 0.09MPA	-0.03 ~ 0.09MPA
Display	color LCD touch screen operation control, full English operation interface, automatic control and manual control combined, unique temperature change curve online display, conducive to data observation and scientific research	color LCD touch screen operation control, full English operation interface, automatic control and manual control combined, unique temperature change curve online display, conducive to data observation and scientific research
Pump	Supporting imported British RS brand peristaltic pump and motor	Supporting imported British RS brand peristaltic pump and motor
Cooling water	With water cooling system to support the use of heat sensitive and high concentration products, provide corresponding patent certificate	With water cooling system to support the use of heat sensitive and high concentration products, provide corresponding patent certificate
Dimensions	950 × 700 × 1715MM (L × W × H)	950 × 700 × 1715MM (L × W × H)
Weight	205kg	205kg

10.SPD-3000F Freeze Spray Dryer

APPLICATION

SPD-3000F laboratory Spray freezing dryer can be used for low-temperature dehydration of heat-sensitive, viscous, active and high sugar materials, such as Chinese herbal medicine and nature product extract, dairy product, biological agent, enzyme, fruit original juice, and polymer materials.

FEATTURES

- With combination of spray dryer and vacuum freeze dryer, SPD-3000F laboratory Spray freeze dryer has the more rapid drying speed than traditional vacuum freeze dryer. The dried powder basically retains their original biological and chemical properties for easy and long-term preservation and when dissolved in water again, materials return to the state of pre-freeze-drying.
- SPD-3000F laboratory spray freeze dryer adopts a cooling system of air-cooled condensing closed compressor with rapid cooling performance, low freezing temperature and strong moisture absorption ability. Temperature and vacuum degree are displayed in a digital, accurate, and direct mode.
- Color LCD touch screen parameters can display drying chamber temperature/pump speed/fan frequency/de-blocker frequency/drying chamber pressure.
- In dehydration, the present equipment heats and sublimates natural air to maintain the security of samples.
- Vacuum pump built-in.
- The convenient and reliable vacuum connection adopts international standard clamp.
- Stable performance, easy operation and low noise.
- Compared with traditional freeze dryer: rapid freeze-drying of wall sticking and organism containing liquid materials (juice, traditional Chinese medicine extract, etc). The powder size is adjustable within a certain range.



PARAMETERS

Model	SPD-3000F
Power	12KW
Voltage	380V
Capacity	2000/batch (5~6 hours per batch)
Spray freezing temperature	<-30°c
Cold trap temperature	≤ -60°c
Vacuum pump power	2KW
Max. vacuum pressure	<20Pa
Spray pressure	2-5Bar(adjustable)
Compressed air	4.2m³/h
Nozzle type	Two fluid nozzle
Nozzle Jet	0.7mm standard/(0.5/0.75/1.0/1.5/2.0mm available)
Body material	SUS-304 Stainless steel
Operation mode	Automatic/Manual
Vacuum pump plug	yes
Vacuum connection	Standard clamp
Seal of cyclone/cylinder	Silicone
Vacuum degree display	Digital
Dimensions	1600*1080*1750mm
Weight	300KG
Display	7-Inch LCD display
Sample safety	Low temperature & vacuum
Particle size	1~100um

11. SPD-5000 Vacuum Inert Loop Spray Dryer

APPLICATION

Suitable for heat sensitive water-based and organic solvent to be dry in low temperature, included inert loop system, solvent recovery system, cooling system and vacuum system.

DESCRIPTION

SPD-5000 vacuum low temperature spray dryer is an enhanced product of SPD-500 desktop spray dryer. The SPD-500 desktop spray dryer is popular with scientific researchers because of its small size and convenient operation. We have developed a vacuum low temperature spray dryer and an organic solvent spray dryer on the basis of SPD-500. After users purchase the SPD-500 It only needs to purchase vacuum components or nitrogen circulation system to form a vacuum low-temperature spray dryer or an organic solvent spray dryer, and the connection is very convenient, saving experimental funds and venues, and convenient for users to purchase on demand.

The problem of rapid drying of heat-sensitive materials has always plagued many scientific researchers. Common vacuum drying and spray drying have great damage to the biological activity of the material or the structure of the material. The freeze-drying time is long, the energy efficiency is low, and the drying After the material is agglomerated, it needs to be crushed a second time. SPD-5000 laboratory vacuum low temperature spray dryer, when you need ordinary spray drying, only need to use the main body of the spray dryer, there is no need to open the vacuum component, and your material needs to be dried at a low temperature below 60 °C, you open Vacuum components can be quickly dried at an inlet air temperature of 55°C, completely avoiding the destruction of the material's activity or structure during the drying process, and providing extremely convenient and safe drying methods for heat-sensitive materials, such as enzyme preparations and living organisms. Products, extracts of natural products of traditional Chinese medicine with high sugar content, heat-resistant polymer materials, materials that vaporize when heated, etc.

FEATURES

- SPD-5000 laboratory vacuum low temperature spray dryer is divided into a desktop spray dryer main unit and vacuum components. The modular design facilitates the switching between high temperature spray drying and vacuum low temperature spray drying;
- The spray head is a concentric spray head. Make sure there is no eccentricity during spraying and it will spray to the side of the bottle wall. After the spray head is installed, it can move up and down to facilitate the adjustment of the spray position and improve the spray drying effect;
- SPD-5000 laboratory vacuum low temperature spray dryer uses a color touch screen operation, real-time regulation of PID constant temperature control, so that the temperature control in the full temperature zone is accurate, the heating temperature control accuracy is ±1℃, and the feed rate of the peristaltic pump can be adjusted at any time.
- The entire experimental process of spray drying is completed in a vacuum environment, which greatly reduces the material drying temperature and solves the problem of spray drying of heat-sensitive materials;
- The atomization structure of the two-fluid spray is made of high-quality stainless steel materials, with a compact design, no auxiliary equipment, easy to use, and as long as new.
- The instant spray drying is completed under low temperature (minimum 50℃) conditions, and the moisture content after drying is less than 1%. Under such drying conditions, substances that are easily oxidized, volatile, and heat sensitive can maintain chemical structure and biological activity well ;

SPECIFICATIONS

Model	SPD-5000 Vacuum inert loop spray dryer
Rated drying capacity	500ml/h
Minimum inlet air temperature	50°C
power supply	220V/3000W
compressed gas	4.2m³/h, 2-5bar
nozzle	0.7mm standard, (0.5/0.75/1.0/1.5/2.0mm available)
Spray head	Two-fluid, concentric spray head, not eccentric during atomization, spray head can move up and down
Particle size after drying	1-25μm
Operation method	Automatic/Manual
Maximum feed volume	500ml/h
Min material handling capacity	20ml
Drying room material	SUS 304 stainless steel
Inlet temperature range	50～200℃
Heating temperature accuracy	±1℃
Cyclone material	SUS-304 stainless steel
Frame material	SUS-304 stainless steel
Sealing ring	Silica gel
Outlet temperature	40℃
display	7-Inch LCD display with USB interface
Temperature protection	Have
Spray head material	Concentric spray head, SUS 316 L stainless steel
Vacuum degree	-0.08Mpa

12.SPD-P Series Pilot High Speed Centrifugal Spray Dryer

DESCRIPTIONS:

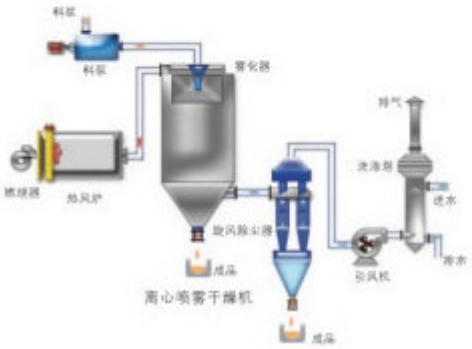
It is most suitable for producing solid powder or particle products from liquid materials, such as: solution, emulsion, suspension and pumpable paste states, For this reason, when the particle size and distribution of the final products, residual water contents, mass density and the particle shape must meet the precise standard, spray drying is one of the most desired technologies.

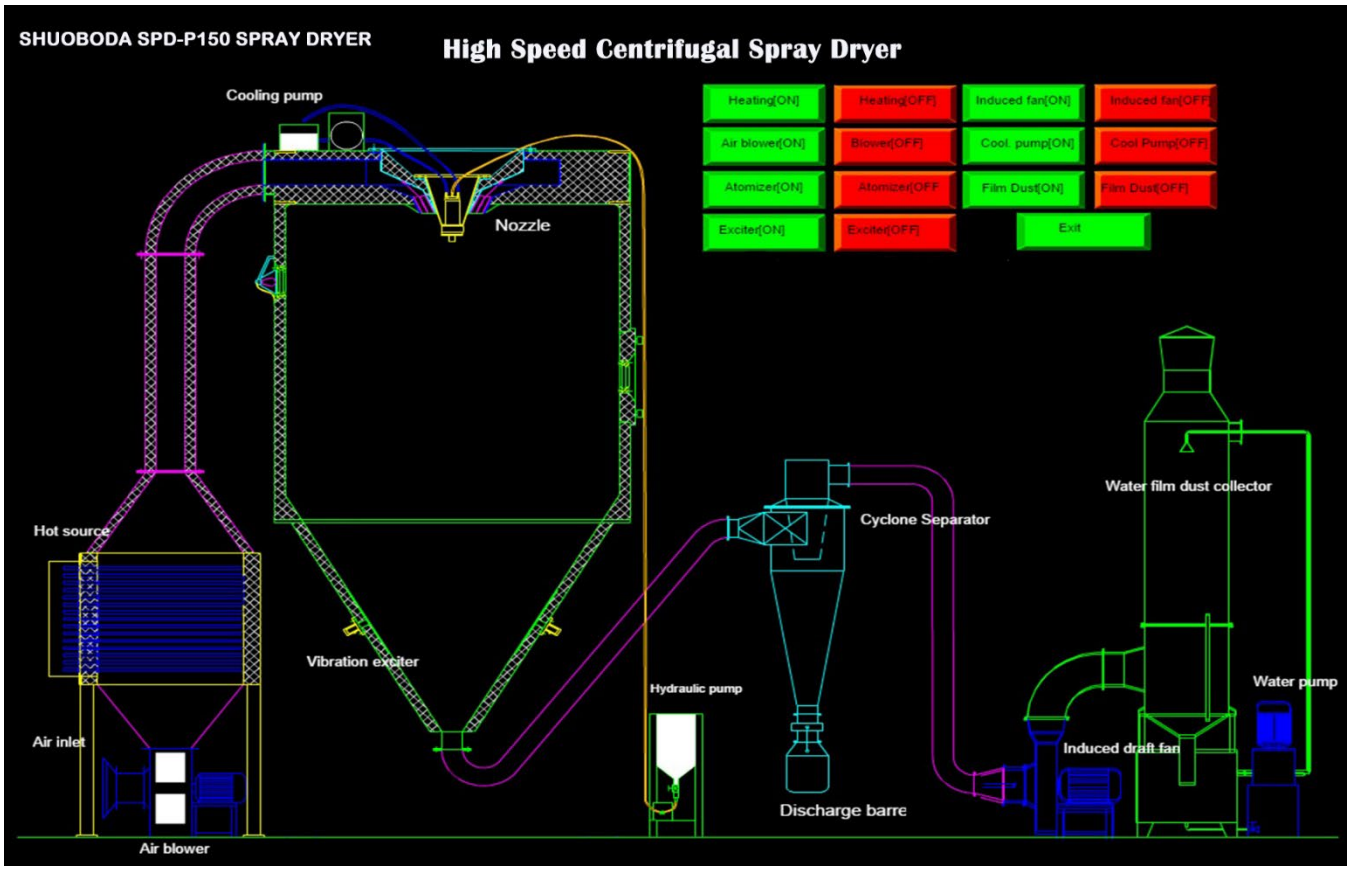
PRINCIPLE:

After been filtered and heated the air enters into the air distributor on the top of the dryer. The hot air enters into the drying room in the spiral form and uniformly. Passing through the high-speed centrifugal sprayer on the top of the tower, the material liquid will rotate and be sprayed into the extremely fine mist liquid beads. Through the very short time of contacting the heat air, the materials can be dried into the final products. The final products will be discharged continuously from the bottom of the drying tower and from the cyclones. The waste gas will be discharged from blower.

FEATURES:

- The drying speed is high when the material liquid is atomized, the surface area of the material will increase greatly. In the hot-air flow,95%-98% of water can be evaporated at a moment. The time of completing the drying is only several seconds. This is especially suitable for drying the heat sensitive materials.
- Its final products own the good uniformity, flow ability & solubility. And the final products are high in purity and good in quality.
- The production procedures are simple and the operation and control are easy. The liquid with moisture contents of 40-60%(for special materials, the contents might be up to 90%).can be dried into the powder or particle products once a time. After the drying process, there is no need for smashing and sorting, so as to reduce the operation procedures in the production and to enhance the product purity. The product particle diameters, looseness and water contents can be adjusted through changing the operation condition within a certain range. It is very convenient to carry out control and management.





SPECIFICATIONS:

Parameters	SPD-P					
	5	25	50	100	150	200-2000
Inlet temperature °C	140~350 Automatically controlled					
Outlet temperature °C	~80-90					
Water evaporation capacity kg/h	5	25	50	100	150	200-2000

Drying form of centrifugal nozzle	Compressed air	Mechanism drive				
Revolution of atomizer (r.p.m)	25000	18000	18000	18000	15000	8000-15000
Diameter of atomizing disc(mm)	50	100	120	140	150	180-340
Heating source	Electricity	Electricity+Steam	Electricity+Steam, Oil fuel, gas			Depends on the user
Max. power of electric heater KW	9	36	63	81	99	
Overall dimension (m)	1.8×0.93×2.2	3×2.7×4.26	3.7×3.2×5.1	4.6×4.2×6	5.5×4.5×7	Depends on practical conditions
Dried powder recovery rate %	⩾95	⩾95	⩾95	⩾95	⩾95	⩾95

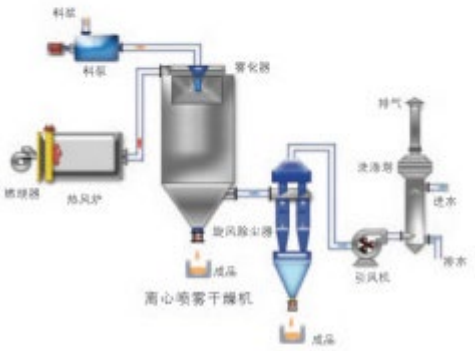
MACHINE SHOW

13.SPD-P5 Pilot High Speed Centrifugal Spray Dryer

WORKING PRINCIPLE OF THE EQUIPMENT

SPD-P5 spray dryer is a drying equipment suitable for the liquid material with low temperature point and high viscosity, which has been improved several times on the basis of domestic and foreign spray dryers. The working principle is: cold air is filtered through the filter, then enters the heater, is heated to a certain temperature, and then enters the air distributor at the top of the spray tower, and the hot air spirally flows to the bottom of the tower. The liquid is pumped to the centrifugal atomizer at the top of the tower body, and the liquid is torn into extremely small mist droplets. The liquid droplets and the hot air are in parallel contact, and the heat exchange is fully performed. The water content is rapidly vaporized and evaporated, and dried in a very short time as a finished product. The finished product is separated by a cyclone and discharged, and the exhaust steam is discharged by an induced draft fan.

FEATURES



1. The drying time of the equipment is short, the material is only 5 seconds from the entrance and exit, and the general active ingredients are not destroyed.
2. The spray tower has large diameter, can adapt to the drying of various materials, and the inlet air temperature can be adjusted, and the working range is wide.
3. The equipment is fully equipped to meet the requirements of the production process to the greatest extent.
4. Simple operation, wide adaptability, no need for professional operators.
5. The unique air inlet spiral distributor is the company's patent, which can ensure that the air volume is absolutely even down on the circumference of the tower body, and the material sticking wall is minimized.
6. Advanced and convenient cleaning door can facilitate the operation of the workers, and at the same time ensure absolute sealing, so that the material does not stick to the wall, and a cleaning door is arranged on the tower body to facilitate all-round cleaning.
7. The tower is absolutely mirror polished without any dead angle. One is to avoid sticking, and the other is to facilitate cleaning.
8. The inlet air temperature is controllable and can fully satisfy the drying process of the material.
9. All pipes and cyclones are equipped with a quick opening cleaning port.
10. The heater is changed into a U-tube form, which can overcome the defects of the weld cracking caused by the thermal expansion and contraction of the heating pipe. The U-shaped tube has an outer casing to avoid air leakage between the pipe and the tube plate. The fins are made of aluminum alloy, which improves the heat transfer coefficient and heat transfer efficiency.

APPLICATION

TECHNICAL PARAMETERS

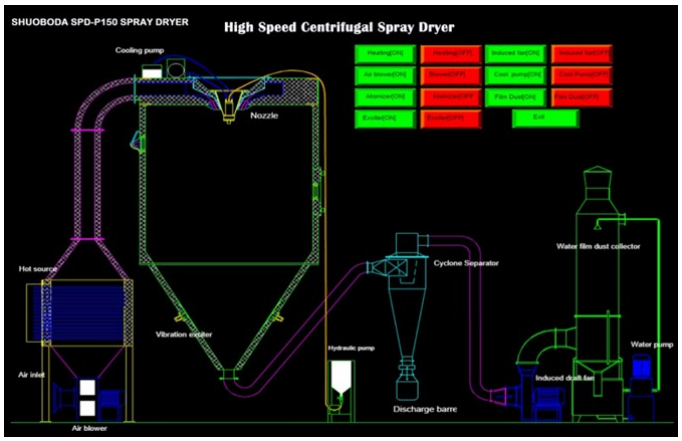
- Water evaporation: 5Kg / h
- electric heating power: 18kw
- inlet air temperature: 30 ~ 250 ° C (can be determined according to the nature of the material)
- Outlet temperature: 60 ~ 90 ° C (can be determined according to the nature of the material)
- Using touch screen inverter system control technology, heating temperature control accuracy: ±1 °C
- Color touch screen inverter control, high degree of automation
- weight: 300KG
- size: 1300 × 1100 × 2000 (mm) L x W x H

CONFIGURATION

NO.	Item Name	Specs	Material	Qty	Remark
Feeding system					
1	Peristaltic pump	---	---	1pc	P=0.55KW
Hot air system					
1	air filter	---	Frame is SUS304	1 set	Primary filter
2	air filter	---	Frame is SUS304	1 set	Medium effect filter
3	Electric heating	---	SUS304	1 set	P=18kw
4	Hot air duct	---	SUS304, δ1.5	1 set	With insulation, matt treatment
5	Pipe flange	---	SUS 304		---
Drying tower system					
1	Main tower	Diameter: ϕ0.8m	304, δ2.0	1 set	Inner wall mirror polished, outer wall matt finish
2	Adjustable hot air distributor	---	SUS304, δ2.0	1 set	mirror reflection
3	Variable spiral inlet vortex	---	SUS304, δ3.0	1 set	mirror reflection
4	Electric high speed centrifugal atomizer	1-5	SUS304, alloy	1 set	P=0.75kw frequency control
5	Vibrator	---	SUS 304	1 pc	Manual
6	Clean up the inspection door	ϕ300mm	SUS 304	1 pc	
7	Door handle	---	SUS 304	1 set	

Receiving system					
1	Primary cyclone separator	LT-280	304, δ2.0	1pc	Long cone, matt finish, with quick opening
2	Receiving bucket	---	---	1pc	Transparent plastic bottle
3	Induced draft fan	9-19-4A	Q235A	1 set	P=2.2kw
4	Air duct	---	304, δ1.5	1 set	Matte processing
5	Exhaust pipe	---	304, δ1.5	1 set	---
Control System					
1	Control cabinet is SUS304 stainless steel, color touch screen control (1) Inlet air temperature display, automatic control (2) Outlet temperature display (3) Feed amount control (4) Dynamic display of system operation process				---
2	Nebulizer water cooling				---

DIAGRAM



14.SPD-P10 High Speed Centrifugal Spray Dryer

WORKING PRINCIPLE OF THE EQUIPMENT

SPD-P10 spray dryer is a drying equipment suitable for the liquid material with low temperature point and high viscosity, which has been improved several times on the basis of domestic and foreign spray dryers. The working principle is: cold air is filtered through the filter, then enters the heater, is heated to a certain temperature, and then enters the air distributor at the top of the spray tower, and the hot air spirally flows to the bottom of the tower. The liquid is pumped to the centrifugal atomizer at the top of the tower body, and the liquid is torn into extremely small mist droplets. The liquid droplets and the hot air are in parallel contact, and the heat exchange is fully performed. The water content is rapidly vaporized and evaporated, and dried in a very short time as a finished product. The finished product is separated by a cyclone and discharged, and the exhaust steam is discharged by an induced draft fan.

FEATURES

- The drying time of the equipment is short, the material is only 5 seconds from the entrance and exit, and the general active
- ingredients are not destroyed.
- The spray tower has large diameter, can adapt to the drying of various materials, and the inlet air temperature can be adjusted, and the working range is wide.
- The equipment is fully equipped to meet the requirements of the production process to the greatest extent.
- Simple operation, wide adaptability, no need for professional operators.
- The unique air inlet spiral distributor is the company's patent, which can ensure that the air volume is absolutely even down on the
- circumference of the tower body, and the material sticking wall is minimized.
- Advanced and convenient cleaning door can facilitate the operation of the workers, and at the same time ensure absolute sealing, so that the material does not stick to the wall, and a cleaning door is arranged on the tower body to facilitate all-round cleaning.
- The tower is absolutely mirror polished without any dead angle. One is to avoid sticking, and the other is to facilitate cleaning.
- The inlet air temperature is controllable and can fully satisfy the drying process of the material.

- All pipes and cyclones are equipped with a quick opening cleaning port.
- The heater is changed into a U-tube form, which can overcome the defects of the weld cracking caused by the thermal expansion and contraction of the heating pipe. The U-shaped tube has an outer casing to avoid air leakage between the pipe and the tube plate. The fins are made of aluminum alloy, which improves the heat transfer coefficient and heat transfer efficiency.

APPLICATION

EQUIPMENT PARAMETERS

Model: SPD-P10 High-Speed Centrifugal Spray Dryer
(Diameter of drying tower: Φ1600mm; Height of drying tower: 4000mm)
- Water evaporation rate: 10-20Kg/h;
- Inlet air temperature: 140℃-300℃ adjustable;
- Outlet air temperature: 75-120℃;
- For the atomizer
1. Model: R-XH-10
2. Power: 1.5KW
3. Disc diameter: Φ80mm
4. Rotation speed: 18000r/min
- Heat source: Electrical heater, 36KW
- PLC control, main electrical components brand is Schneider brand.

DETAILS SPECIFICATIONS

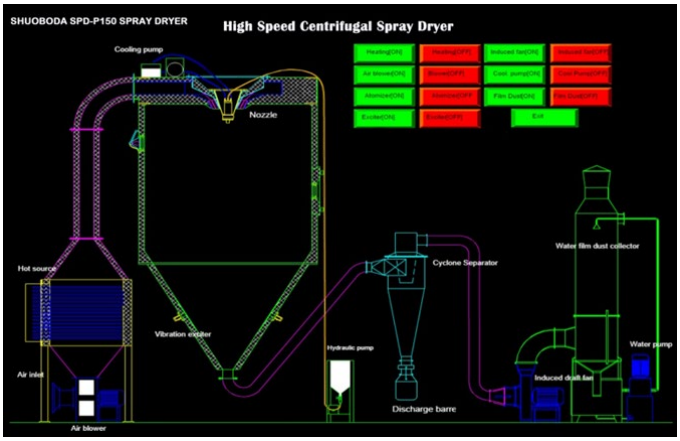
No.	Name	Spec.	Qty	Material	Remarks
Feeding system					
1	Peristaltic pump	BT300	1unit	Health class	300W
2	Feeding pipeline & valve	----	1set	Hygienic silica gel	----
Circulating system					
1	Blast fan	9-19-3.15A	1unit	Q235	1.1KW
2	Suction fan	9-19-4.5A	1unit	Q235	4KW
3	Hot air insulation pipeline	Inside: δ=2mm; Outside: δ=1.2mm	1set	SUS304	δ=50mm
4	Exhaust pipeline	δ=1.5mm	1set	SUS304	Quick
5	Pipeline connection	Flange or quick	1set	SUS304	----
Air heating purification system					
1	Pre & post-efficiency air filter	----	1set	Outside: SUS304	Non-woven cloth

2	Electric heater	----	1set	SUS304	36KW
Main machine system					
1	Drying room	D1600 H4000	1set	SUS304 Inside: 2mm Outside: 1.5 m	Inside & outside: full weld. Top of tower: 3mm
2	Inlet air volute	Inside: δ=2.0mm, Outside: δ=1.5mm	1set	SUS304	----
3	Hot air distributor	----	1set	SUS304	----
4	Atomizer	R-XH-10	1set	SUS304	1.5KW Frequency control
5	Lighting device	100W	1set	----	----
6	Viewing glasses	610X510	1set	----	----
7	Cyclone separator	XF250, δ=2mm	1set	SUS304	----
8	Bin	----	1pc.	SUS304	----
Controlling system					
1	Control cabinet	----	1unit	Carbon steel spraying plastic	----
2	Programmer	----	1unit	----	----
3	Temperature module	----	1set	----	----
4	Frequency converter	Atomizer	1set	----	----
5	AC Contactor	----	1set	----	----
6	Touch screen	----	1set	----	----
Other matching system					
1	Ladder		1set	SUS304	----
2	Drying tower supporter		1set	SUS304	----

LIST OF SPARE PARTS

No.	Name	Spec.	Qty	Remarks
1	Viewing glass	Φ180	1pc.	----
2	Hot relay	PT-100	1pc.	----
3	Special tools for atomizer	SD-P10	1set	----

DIAGRAM



Why choose us?

SHUOBODA® Lab Spray Dryer have been applied by over 1,500 domestic customers of top universities, enterprises and research institutes including AMSS Institute of Systems Science, Tsinghua University, Shanghai Jiao Tong University, South China University of Technology, Wuhan University, Tongrentang, Xiehe Pharmaceutical, Bright Dairy, Hong Kong Polytechnic University, Harbin Pharmaceutical Group, Strong Group, General Electric (GE) Shanghai R&D Center, Jiangnan University, China Agricultural University, Zhejiang University, Tongji University and Huazhong University of Science and Technology. With firm grasp of domestic market advantage, SHUOBODA® also vigorously expands overseas markets with equipment exported to the United States, Italy, South Korea, Singapore, Canada, Malaysia, Chile and Russia, receiving extensive praise in view of product quality.

How to find the model?

SPD-15A lab spray dryer can be used for organic & water solvents

SPD-1800F lab low temperature spray dryer can be used for thermo-sensitive materials and high carbohydrate compositions materials.

SPD-2000 lab vacuum spray dryer can be used for probiotics, enzyme and other thermo-sensitive materials.

SPD-3000F Lab spray freeze dryer is a new freeze dryer method which is faster than traditional freeze dryer.

SPD-1000 laboratory spray granulator (fluidized bed granulation) can be used for granulation and coating.