

**BG-250**

# High Efficiency Coating Machine



**EQUIPMENT  
TECHNICAL PARAMETER**

**南京翰洋智能设备有限公司**  
NANJING HANYOO PHARMATECH CO., LTD.



# BG-250 High Efficiency Coating Machine



## APPLICATION

1. BG high efficiency coating machine is a special equipment for coating Chinese and western tablets, pills and candies with aqueous and organic films. The equipment is manufactured in accordance with the GMP requirements of the pharmaceutical industry; The entire shell, coating roller (coating pan), heat blower, spraying device and all parts in contact with the drug are made of stainless steel.
2. The whole process is controlled by the microprocessor programmable system and can also be controlled by manual operation. The control system has a variety of applications,

operation status selection, closed-loop control of speed and temperature, open-circuit control of negative pressure in the pot of the coating machine and hot air supply volume, complete control parameter display and working status recording and printing function.

3. All coating operation is carried out in closed state, no dust flying and spraying liquid splashing, is a high quality, efficient, reliable, clean, energy saving, easy to operate in line with SOP operation of the new coating equipment.
4. The PLC control system in Hanyang coating machine contains automatic control and display of all process parameters such as negative pressure, hot air flow, exhaust air flow, speed, temperature, etc. New cleaning button, automatic in-position cleaning (optional), automatic self-discharging device, automatic side door opening and closing (optional), all on the PLC one click to complete. Make the writing and execution of the position operation method (SOP) use digital quantities instead of analog quantities, produce different batches of drugs with the same technical parameters, and strive to achieve zero differences between batches. The stability of drug quality is ensured.

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## HOST DESCRIPTION

1. Using the new microcomputer PLC module, hot air temperature setting, control and roller speed adjustment and other quantified indicators to guide the operation are completed on the touch key of the computer control panel, and the operation panel is a fully sealed light touch film interface, the host cleaning has no impact, reliable and stable performance, and has programmable functions. The explosion-proof motor drives the drum to rotate clockwise through the cycloidal pin wheel.
2. Negative pressure detection: Add a negative pressure detection point in the upper box of the coating machine, and install 23300-3kpa differential pressure meter produced



Streamline  
deflector



Discharge device

by DWYER Company in the operating cabinet. The operator can operate the touch screen according to the process regulations (for example, the negative pressure value is 10Pa) and control the exhaust fan speed to achieve the purpose of controlling the negative pressure in the pot.

3. Streamline guide plate: Under the action of streamline guide plate agitator, the core turns smoothly, exchanges frequently, eliminates the phenomenon of the core falling from height and collision, solves the debris and knock edge, and improves the yield. The narrow surface of the baffle eliminates the adhesion of the dressing on its surface, saves the dressing and improves the quality of the drug.
4. Temperature detection: the inlet and outlet of the coating drum are equipped with temperature sensors, and the temperature signal input PLC automatically controls the heat exchanger after comparing with the set value, so as to achieve the control of the coating temperature value.
5. Wind speed detection: Add a wind speed detection point in the heating wind pipeline, and install the 2001AV anemometer produced by DWYER Company in the operating cabinet. The operator can operate the touch screen to control the speed of the hot fan according to the wind speed value specified in the process (8m/s) to meet the requirements of controlling the air supply volume.
6. Automatic discharge: automatic discharge device, easy to install, quick to use.

## SPRAY SYSTEM

1. Control of spraying volume: The slurry delivery pipe system spray gun has a manual slurry adjustment function: the main door of the high-efficiency coating machine is equipped with a scale adjustment valve and a peristaltic pump speed adjustment, both of which can adjust the spraying volume.



2. Control of slurry atomization coverage: The spray gun can adjust the angle, flow rate, and fan adjustment buttons on the nozzle according to the amount of material in the coating pot, which



can achieve the size of the atomization coverage area, easy to operate and master, flexibly control the process requirements, avoid rigid mechanical shaping control and human operation technical factors that affect the atomization effect, facilitate the formulation of job SOP, and save dressings and reduce costs.



3. Spray gun configuration: Choose the Japanese Aneste Iwata spray gun. The 304 material adopts a streamlined structure design, which is conducive to online cleaning and reduces gas turbulence; The design allows for shooting when the compressed air pressure is 0.3 MPa, ensuring that the dressing always opens the atomization gas circuit before spraying during the atomization process, and closes the dressing before closing the atomization gas circuit when closing the gun. This eliminates the phenomenon of liquid droplets during the atomization process.

4. Cart type single-layer mixing tank: with stepless speed regulation pneumatic mixing; The 50L mixing tank is installed on 4 rollers for flexible movement, and is designed with fixing bolts for the peristaltic pump, which can be integrated with the peristaltic pump for easy use. The machine is entirely made of stainless steel and has undergone mirror polishing treatment on the inner surface, which meets the requirements of GMP standards.



## HOT AIR INTAKE SYSTEM

1. After the fan starts operation, the outdoor air continues to enter from the air inlet, and the first coarse filter is carried out on the large and medium particles in the air through the initial effect filter; Then it enters the medium effect filter and filters the air generally. Then filtered by the high efficiency filter, the filtration accuracy reaches the requirements of 100,000 class cleanliness, and finally the filtered air is heated by the heater, through the hot air conveying pipe, into the coating machine drum, and the tablet coating material is heated and dried. Meet new GMP requirements.
2. The fan component adopts centrifugal fan, which has large air volume and low noise during operation.
3. The use of primary, medium and high efficiency three different types of filters with different functions, good air purification effect.
4. The heat exchanger has high thermal efficiency, and in special cases, it can also be equipped with electric heating heat exchangers, which has strong adaptability.
5. Each filter section is equipped with a quick detachable access door that is both wide and sealed to facilitate internal maintenance or filter replacement when needed. The machine has the advantages of compact structure, fine production, beautiful appearance and reliable operation.



高效过滤热风机

## EXHAUST AND DUST REMOVAL SYSTEM (LATEST FILTER CARTRIDGE TYPE)

### 1. Overview of filter cartridge dust removal unit

STY filter cartridge pulse dust collector is an efficient dust collector that uses filter materials to separate solid dust from dusty gases through filtration. Because the

filter material is of the filter cartridge type, it is also known as a filter cartridge dust collector.

Filter cartridge dust collectors are widely used in various industrial sectors to capture non cohesive and non fibrous industrial dust. The filter cartridge dust collector has a high dust removal efficiency. Compared with the electrostatic precipitator, it does not have complex auxiliary equipment and technical requirements, and the cost is also lower; Compared with wet dust collectors, dust recovery and utilization are more convenient and do not require winter antifreeze. Therefore, the filter cartridge dust collector belongs to a relatively simple structure and relatively low operating cost equipment in high-efficiency dust collector equipment.

## 2. Structure and working principle of dust removal unit

During normal operation, dusty gas enters the dust collector from the bottom or middle of the equipment. The dust is filtered by the filter cartridge and intercepted on the outer surface of the filter material, while clean air is discharged through the air outlet at the center of the filter cartridge.

After a period of filtration, the dust on the outer surface of the filter cartridge will accumulate more and more, and the increase in resistance of the filter cartridge will affect the air flow of the system. It is necessary to clean the dust accumulated on the surface of the filter cartridge through a cleaning system to achieve the regeneration function of the filter cartridge. Pulse back blowing dust cleaning is achieved by controlling a pulse solenoid valve to open according to a pre-set time through a timing controller. The high-pressure air inside the air bag will instantly enter the center of the filter cartridge, blowing away the dust remaining on the surface of the filter material. Under the influence of airflow and gravity, dust falls into the ash collection bin to achieve the reuse of the filter cartridge.

## 3. Product features

- ① The dust removal equipment can automatically use compressed air to blow back

the filter cartridge according to the setting, restoring the regeneration filtration function of the filter cartridge.

- ② The unique sunken guide plate facilitates dust settling, improves equipment efficiency, and saves energy.
- ③ There are air inlets on both sides, which can be connected according to installation conditions. Both air inlets and outlets are equipped with matching flanges for easy installation.
- ④ The bottom is equipped with an ash collection bucket, which is controlled by pneumatic control and can facilitate ash discharge.
- ⑤ The use of a pressure differential gauge to display the real-time resistance value of the filter cartridge accurately reflects the amount of dust accumulation in the filter cartridge, which can be an important basis for replacing the filter.
- ⑥ The filter cartridge can be disassembled and installed through the front and rear access doors, which is convenient and fast. The appearance and internal structure of the equipment are designed to prevent dust accumulation, with no dead corners and easy cleaning
- ⑦ Pulse blowback type configuration with Australian brand guide nozzle for blowback, increasing blowback air volume by more than 20%.
- ⑧ The equipment can be equipped with explosion-proof fans, the box can be installed with explosion-proof devices, and can be equipped with membrane filter materials.
- ⑨ According to the dust situation, the ash collection method can be made into drawer type or ash collection bucket type.

Compared with other similar products, it has a compact structure, small footprint, extremely convenient customer maintenance and operation, and high cost-effectiveness.



## ELECTRONIC CONTROL SYSTEM

1. The main core component of the control system, PLC, is selected from Siemens programmable logic controller in Germany; Selected Delta variable speed drive, microcomputer controlled temperature control system, and equipped with high-quality photoelectric sensors and thermal sensors. The system works stably, has a low failure rate, is easy to maintain, and is easy to operate.

### 2. Control object

- ① Main unit (coating machine drum operation) variable frequency speed regulation
- ② Exhaust fan operation (negative pressure control of coating machine drum) with variable frequency speed regulation
- ③ Hot air blower operation (hot air volume control) with variable frequency speed regulation
- ④ Spray conveying (peristaltic pump) operation
- ⑤ Dust collector cleaning operation
- ⑥ Heating system control

### 3. Function Description

Protection function: The thermal relay used can connect the overload signal to the programmable controller and display it on the touch screen, making it easy for users to quickly detect faults and effectively protect electrical equipment.

Clock function: The system has a real-time clock displayed on the touch screen, which can be used to calculate the system's running time as needed.

Negative pressure control: Use a frequency converter to change the speed of the induced draft motor to control negative pressure. Equipped with a pointer type negative pressure display meter, the output frequency of the frequency converter can be manually operated on the touch screen to change the exhaust air volume and maintain the negative pressure within the required range.

Temperature control: Currently, there are two types of heating elements: steam and electric heating. According to the difference between the set value and the actual value, the angle seat valve switch is controlled by PLC calculation to change the steam volume, thereby ensuring the hot air temperature of the system.

Real time recording function: It can record production data in real time, including temperature, negative pressure, operation instructions, equipment status, running time, etc. The bright needle printer used has reliable performance and is easy to record information and generate reports

#### 4. Implement functions

It can achieve manual control and automatic (program control) functions.

##### ( 1 ) Manual control

Manually control various executable components on the touch screen, such as the host frequency converter, hot air frequency converter, exhaust frequency converter, spray solenoid valve, vibration motor, and peristaltic pump.

##### ( 2 ) Automatic control

Implement automatic control of each control object according to process requirements;

Implement the work sequence of each object according to the process requirements;

Control the working time of each object according to the process requirements;

Simultaneously start and stop multiple control objects according to process requirements;

Perform up to 99 cycles of operation according to process requirements;

Control of 9 steps according to process requirements;

There can be 9 different process procedures available;

The host speed can be adjusted in any way;

The program can automatically maintain the set negative pressure, speed, and temperature;

The hot air exhaust temperature has a deviation adjustment function;

Negative pressure can be manually adjusted on the touch screen;

## **IN PLACE CLEANING SYSTEM**

1. The CIP cleaning station is equipped with stainless steel containers for dedicated cleaning solutions, cleaning agent transfer pumps and control valves and pipelines, drinking water cold water control valves and pipelines, drinking water hot water control valves and pipelines, purified water cold water control valves and pipelines, purified water hot water control valves and pipelines, and is also equipped with a pressurized water pump.

2. The solenoid valves, actuators, ball valves, and two infusion pumps of each inlet and outlet pipeline equipment are centrally controlled by the control system (controlled on the touch screen according to the set program). Multiple different cleaning programs can be set and stored on the touch screen for use in different situations.

3. All pipelines, supports, and connections to the cleaning pipelines of the host are made of 304 stainless steel pipes.



4. There are several spray heads set between the body and the coating drum, with fixed positions, and the cleaning pipeline enters from the top of the main machine.

5. The coating machine drum is equipped with a detachable spray cleaning head.

The cleaning water collection tank inside the coating machine can be used as a circulating water tank.

7. Four automatic control valves, including overflow valve, drainage valve, circulation cleaning valve, and bottom drainage valve, were installed at the outlet pipeline of the collection tank, which is the drainage assembly of the valves.

8. A pressure pump is installed at the cleaning station to provide high-pressure water to each sprinkler head.

9. A compressed air valve is installed at the end of the cleaning pipeline of the host, which automatically opens when the cleaning program is completed and enters the drying program, allowing compressed air to enter the cleaning pipeline for drying inside the pipeline.

10. Waterproof fog device

There is one pneumatic actuator valve installed on the air inlet pipeline between the inlet fan and the main engine, and two pneumatic actuator valves installed on the exhaust pipeline between the exhaust fan and the main engine, which prevent the air with a large amount of water vapor from corroding the high-efficiency filter and dust removal bag during automatic cleaning and drying, ensuring the normal use of the hot air fan and exhaust fan, and effectively extending the service life of the equipment.

## TECHNICAL PARAMETER

Model			BGB-250
Maximum pill capacity			250kg/time (with a bulk density of 1)
Optimal installation size of equipment			3000*4500*2500mm
Coating drum diameter			φ1450mm
Diameter of feeding port			φ500mm
Drum speed (revolutions per minute)			2.0-14r.p.m
main motor power			4kw
Power of exhaust cabinet motor			11kw
Hot air blower power			3kw
Hot air temperature control range			~800C
Hot air purification efficiency			100000 level
Peristaltic pump model			BT-300-1L
Silicone tube model			17 # Silicone Tube
Host volume (L × W × H)/weight			2000×1800×2100mm/1000kg
External dimensions/weight of hot air cabinet			950×950×2100mm/450kg
External dimensions/weight of exhaust cabinet			950×700×2100mm/550kg
external conditi ons	clean air	pressure	≥0.4Mpa
		Gas consumption	1m <sup>3</sup> /min
	water source	pressure	≥0.15Mpa
		pipe diameter	1 1/2"
	compressed air	pressure	≥0.4MPa
		Gas consumption	65kg/h
	Steam heat dissipation area	m <sup>2</sup>	80

## ELECTRONIC PART LIST(HOST MACHINE )

No.	Name	Model	Manufacturer	Notes	Qty
<b>1、 High efficiency coating machine host</b>					
1	Host material	304-2B thickδ3.0	Zhangpu	-----	1
2	Roller material	304	Zhangpu	-----	1
3	Atomizing spray gun	WA-101	Iwata, Japan	304s pray nozzle	4
4	Explosion proof motor for the host	4KW	Redson	4kw	1
5	CYCLOIDAL REDUCER	R87	Redson	4kw	1
6	Adjustable core ball bearing	UCP214	HRB	-----	1
7	Deep groove bearings	6301	HRB	-----	1
8	chain	16A-2	Suzhou Chain Factory	45	1
9	Sight lamp	Absg	New Dawn Explosion proof		1
10	Differential pressure gauge	2300-1KPa	DWYER	Host negative pressure	1
11	Plate type pressure reducing valve	LR-1/4-D-O	AirTAC	Spray gun adjustment	4
12	Plate pressure gauge	FMA-50-10-1/4	AirTAC	Spray gun adjustment	4
13	Touch Screen	SMART700	Siemens	7-inch color	1
14	EMERGENCY STOP	ZB2-BE102C	schneider	red	1
<b>Electric control cabinet (made of stainless steel material)</b>					
1	Circuit breaker	65N	schneider	4P 63A	1
2	Circuit breaker	65N	schneider	C1P 6A	2
3	AC contactor	LC1E0910M5N	schneider	220V 9A	1
4	AC contactor	LC1E2510M5N	schneider	220V 25A	1
5	Intermediate relay	RXM4LB2P7	schneider	220V	2
6	Intermediate relay seat	RXZE1M4C	schneider	220V	2
7	Thermal overload relay	LRE08KN	schneider	1-1.6A	4
8	frequency converter	Delta EL Series	DELTA	11KW	1
9	frequency converter	Delta EL Series	DELTA	4KW	1
10	frequency converter	Delta EL Series	DELTA	2.2KW	1
11	7-inch color touch screen	smart	Siemens	smart	1
12	Programmable controller	Siemens	Siemens	224XP	1

13	Temperature control meter		Yudian Electric	AI Series	2
14	power switch	Mingwei	Mingwei	D-30BGD	1

NO.	NAME	MODEL	Manufacturer	QTY	BRANE
<b>Efficient filtering hot air blower</b>					
1	fan	DF-2.5-II	Zhejiang Yinniu	1	3kw
2	Primary filter cotton	400*400*5	Suzhou Feiyoute	1	G4
3	medium efficiency filter	740*740*120		1	F8
4	High efficiency filter	740*740*120		1	H13
5	Stainless steel radiator	UZGL4R-11-23	Nanjing Changhong Radiators Factory	1	80 m²
6	pipe	Φ273mm	Hanyoo	1	
<b>Dust removal, noise reduction and exhaust fan</b>					
1	Exhaust centrifugal fan	B4-72-4.7	Shanghai Weida	1	7.5kw
2	Pulse controller	PLC-20-6	Albert	1	Route 8
3	pulse solenoid valve	DMF Series	Albert	4	DC24V
4	Membrane filter cartridge	Φ150×660mm	Zhangjiagang Zhangyang	12	PETF
5	pipe	Φ273mm	Hanyoo	1	
<b>Combination mixing bucket</b>					
1	Air motors	TJ8	Shanghai Pneumatic Complete Equipment	1	
2	Caster wheels	3 inch	Shen Hua	4	2 Directions 2 Mixtures
3	peristaltic pump	BT-300	Baoding Leifu	1	
4	Can body	SUS 304	Jiangsu Hanyang	1	
<b>六、 Automatic cleaning</b>					
1	Vertical pipeline pump	CDLF8-12	Southern Pump Industry	1	
2	Pump motor	Y2-112M-2	Southern Pump Industry	1	4KW
3	Pneumatic ball valve	Q681F Ø40	Nanjing Shoulong Valve		SUS304
4		Q681F Ø15			SUS304



5	Pneumatic actuator valve	TBN150 Ø250	Shoulong Valve		SUS304
6	Rotating spray ball	Φ50.5	Fude Fluid		SUS304

**Other accessories**

1	Discharge device	SUS 304	Hanyoo	1	
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**HANYOO**  
**翰洋科技**

Add: No. 380 Sanqiaogeng, Gaochun District, Nanjing, China

Tel: +86-025-5621 6295

[Http://www.hanyoopm.com](http://www.hanyoopm.com)