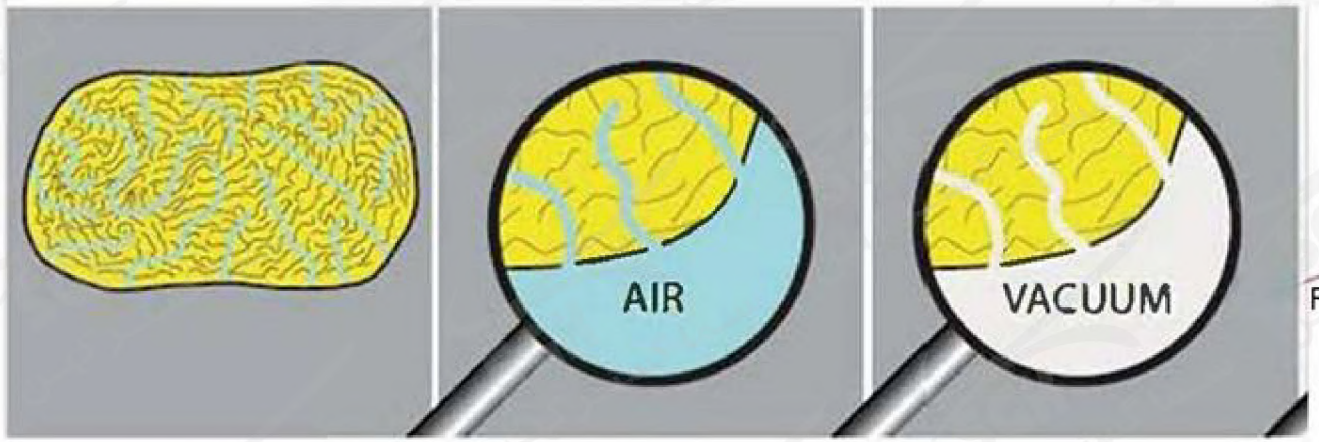
正昌粮机股份
ZHENGCHANG CEREAL AND FEED MACHINERY

SZPL Series
Vertical Vacuum Coater

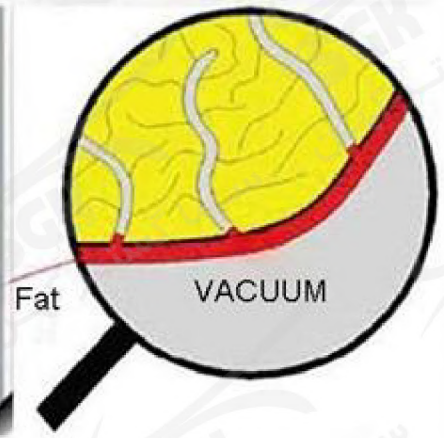
Stability and Reliability Contribute to Long-term Development

饲 料 机 械　中 国 正 昌

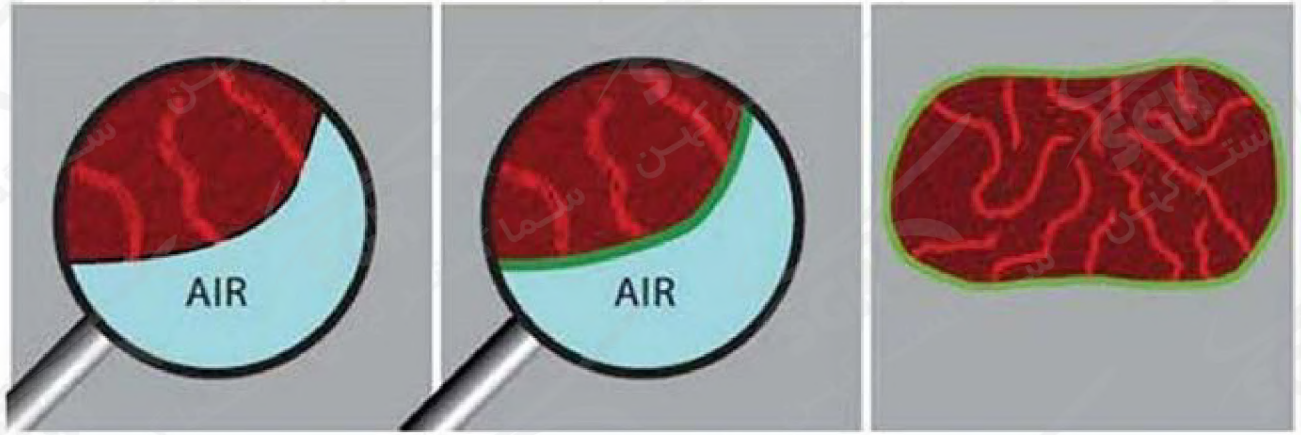
Vacuum Coating Process of Feed Pellets



Extruded Pellet　　Air　　Vacuum State

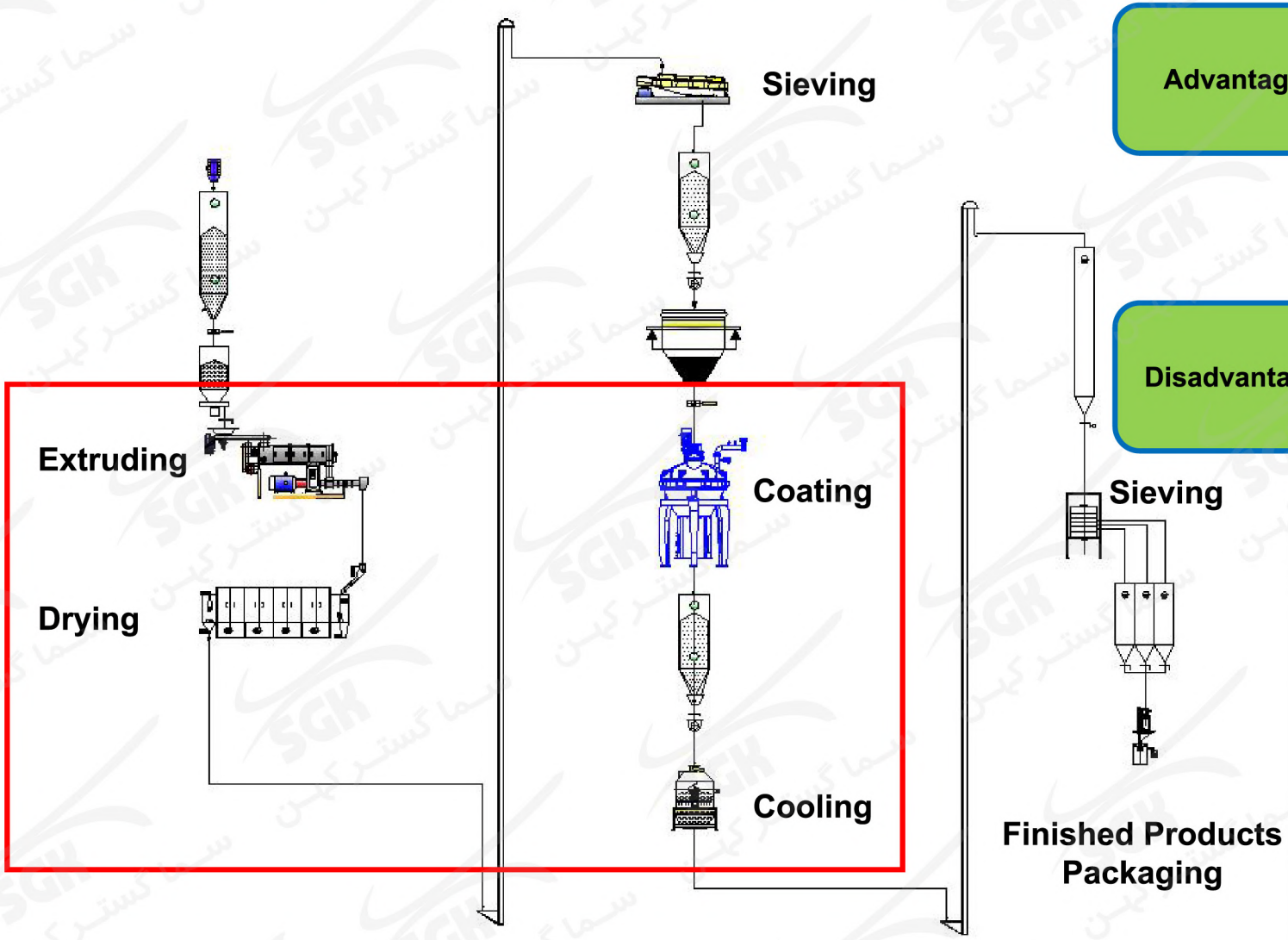


Coating



Release the Vacuum　　Outer Coating　　Finished Product with Smooth Surface

Process Flow Chart - Thermal Coating

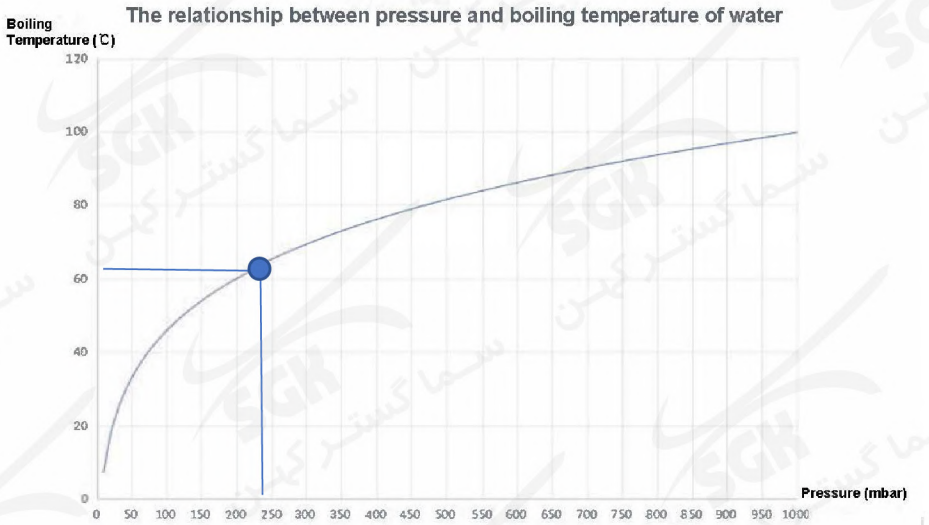


Advantages

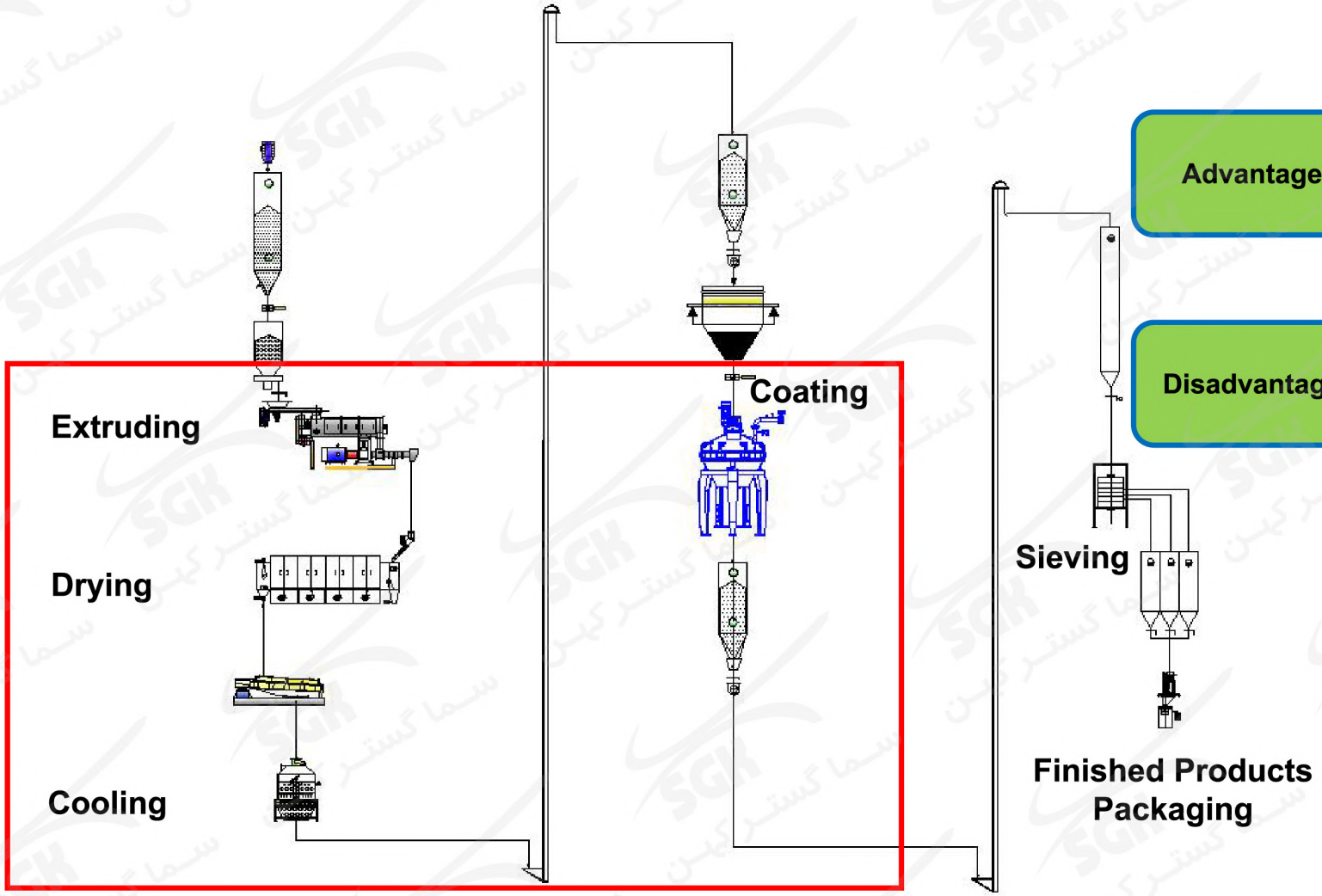
- High particle temperature → good oil absorption effect
- Large particle pore openings→ good oil absorption effect

Disadvantages

- High particle temperature → affects the pumping efficiency of the vacuum pump
- coating heat-sensitive nutrients → adverse effects
- Temperature / vacuum pressure → particle moisture loss (below)



Process Flow Chart - Cold coating



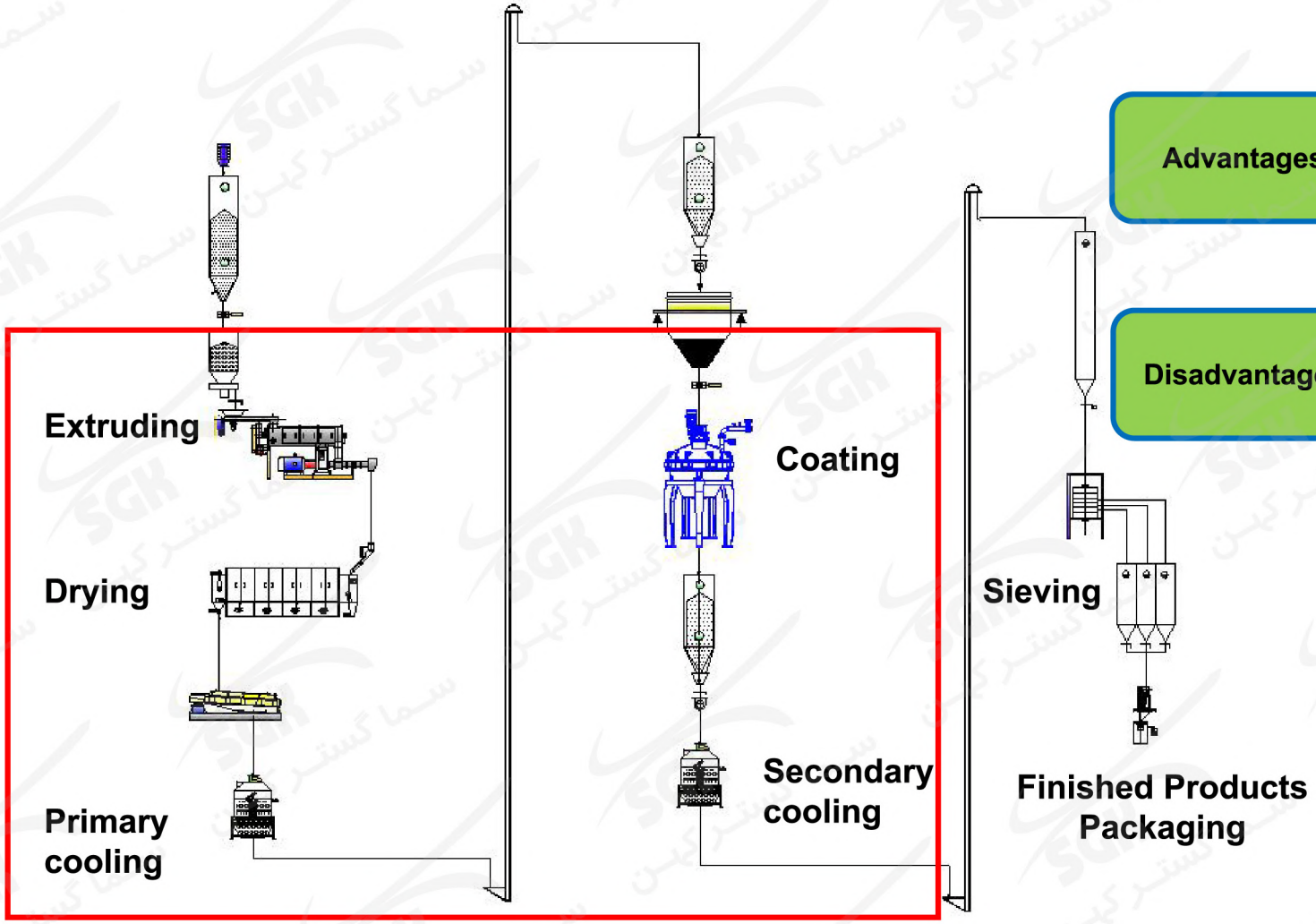
Advantages

- Low feed pellets temperature → no moisture loss under vacuum
- Low feed pellets temperature → heat-sensitive nutrients can be sprayed

Disadvantages

- Cold feed pellets coating → affects oil absorption effect

Process Flow Chart - Secondary Cooling and Coating



Advantages

- Cold coating / thermal coating process can be flexibly selected according to actual needs
- Two times cooling → Combines the advantages of the two processes

Disadvantages

- Two sets of cooling devices → increase cost investment
- Two sets of cooling devices → have plant layout requirements

Main Technical Parameters

Model	SZPL2000	SZPL3000	SZPL4000	SZPL5000
Effective Volume (L)	2000	3000	4000	5000
Capacity (t/h)	4～8t/h	6～12t/h	12～15t/h	15～20t/h
Fat Addition	1～36%	1～36%	1～36%	3～36%
Pellet Diameter (mm)	1～30	1～30	1～30	1～30
Batch Time (min)	5～7	5～7	5～7	5～7
Coating Uniformity	CV≤7%	CV≤7%	CV≤7%	CV≤7%
Residue Rate	≤0.5%	≤0.5%	≤0.5%	≤0.5%
Vacuum Retention	≤100mbar /6min	≤100mbar /6min	≤100mbar /6min	≤100mbar /6min
Maximum Vacuum Degree (mbar)	40	40	40	40
Main Motor Power(KW)	15	22	30	37
Vacuum Pump Power (KW)	22	22	22	22

Adopt International First-class Brand Outsourcing Parts

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SEW EURODRIVE

FESTO

NASH

SMC

Honeywell

SKF

OMAL
EMPOWERED PERFORMANCE

Garlock

METTLER TOLEDO

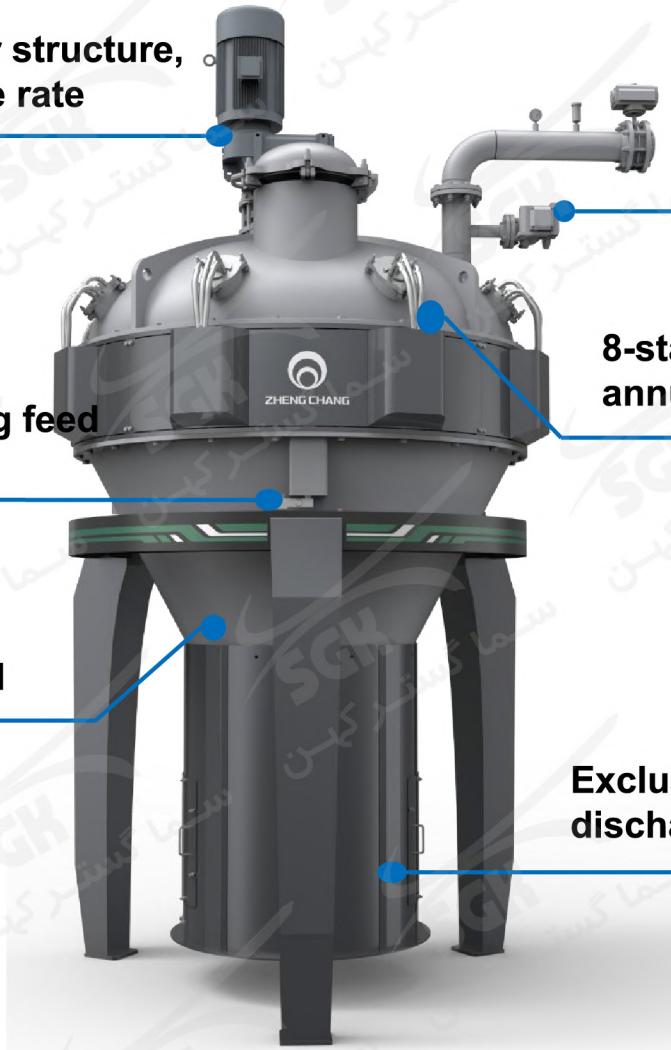
The outsourcing parts of the whole set of vacuum coating system adopt international first-class brands, with stable and reliable quality.

Core Technology Value Points

New double spiral rotor structure, extremely low breakage rate

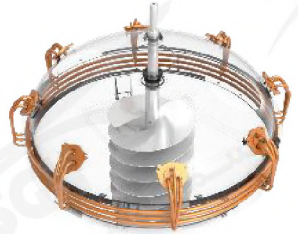
Accurately weigh the incoming and outgoing feed pellets

Internally polished, external sandblasted



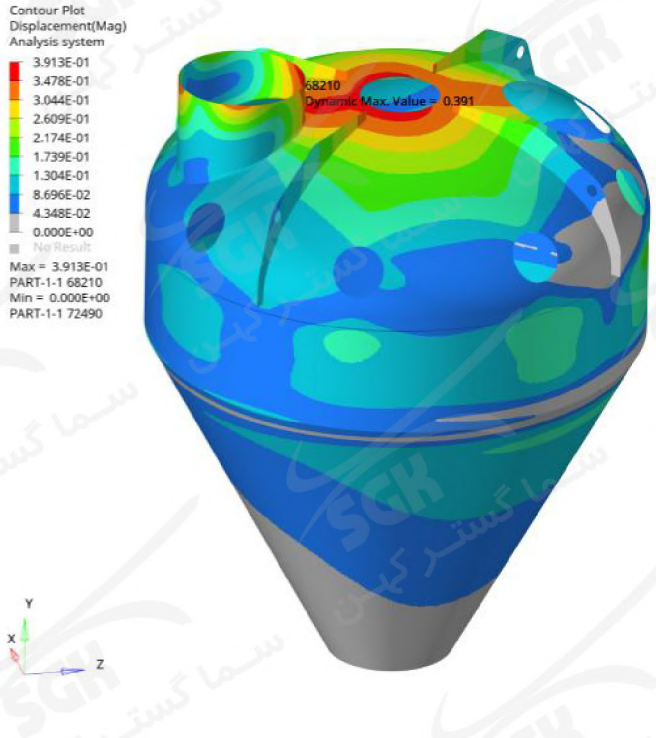
Precise step-by-step vacuum release

8-station evenly distributed annular fan nozzle

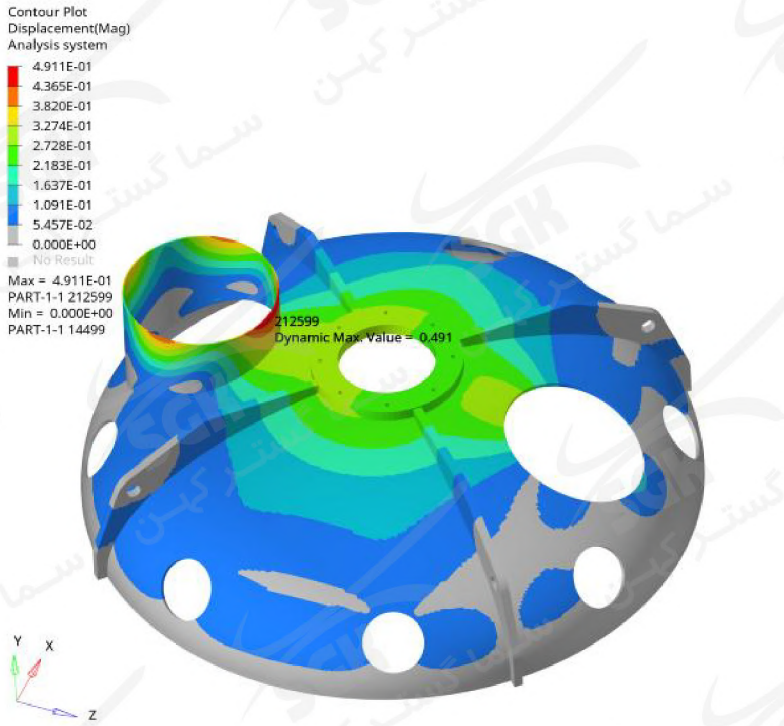


Exclusive patented curved discharge door structure

Design Stress Analysis Calculation



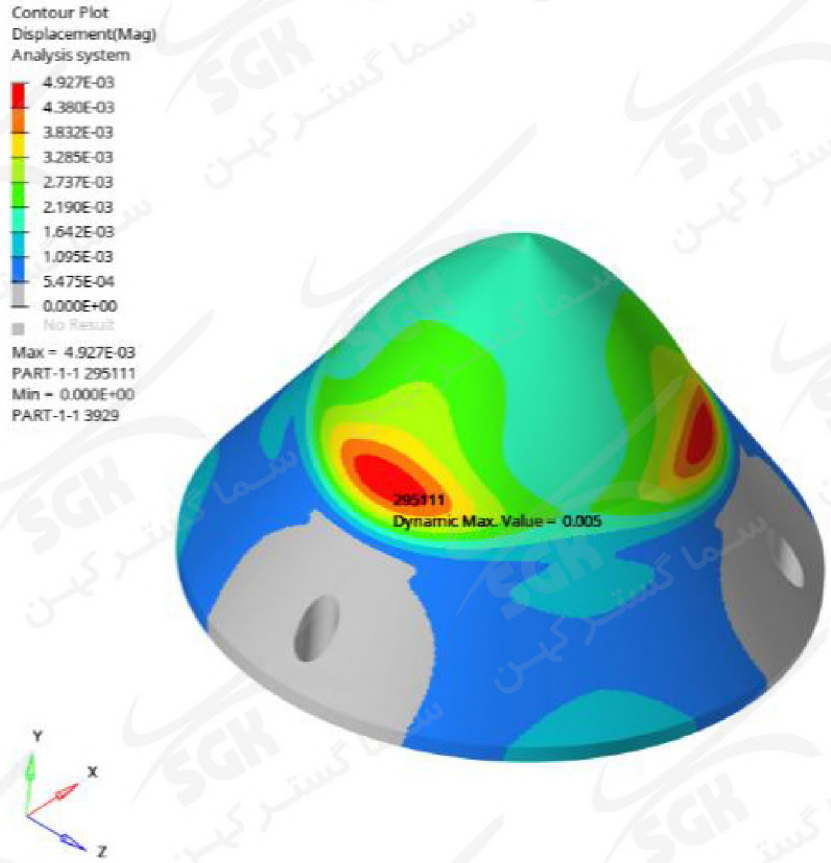
shell stress analysis



top cover stress analysis

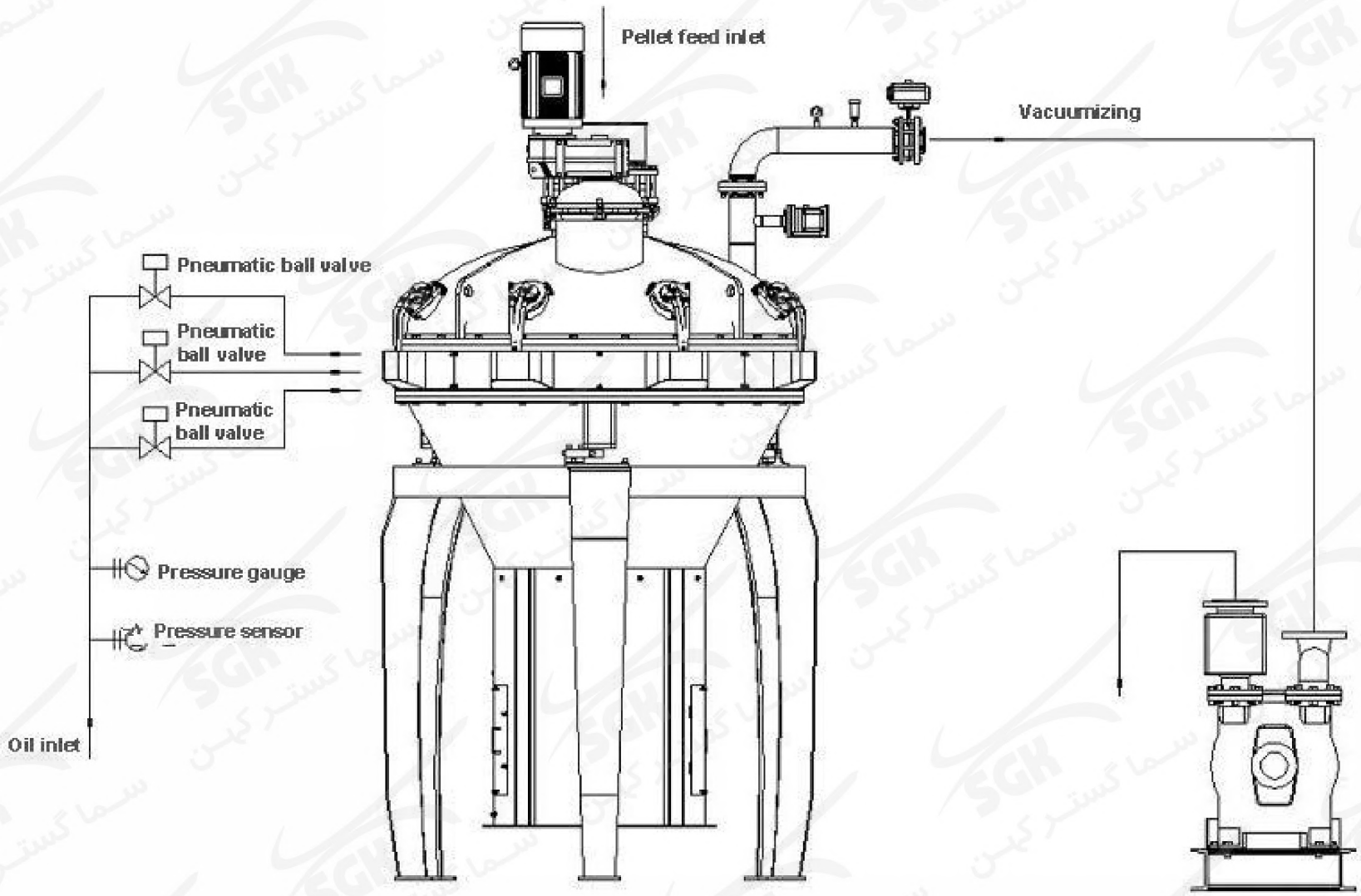
Design Stress Analysis Calculation

Modal analysis of spiral blade shaft



Force analysis of curved discharge door

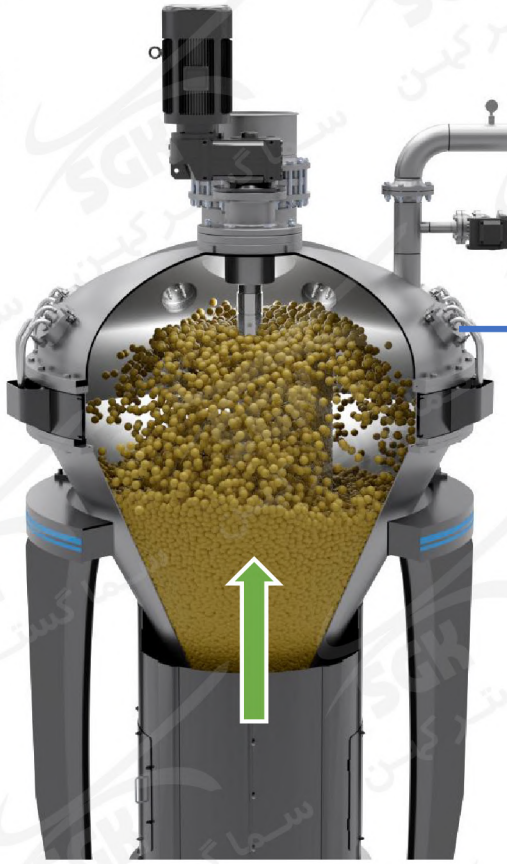
Vacuum Coating Workflow



Equipment Operation Process

Feed pellets entering the interior of the cavity

Vacuumizing



Spiral blade lifting materials

Release of outside air

Oil / Fat coating

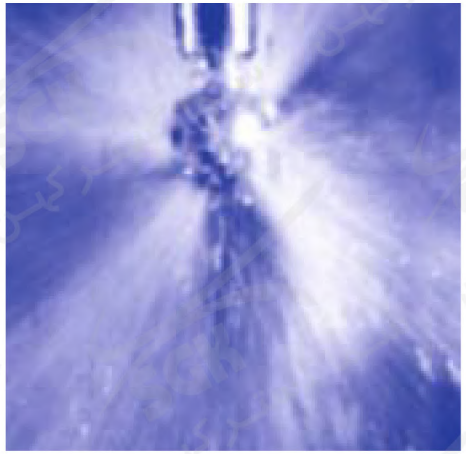
Working Cycle of Vacuum Coating

Serial Number	Item	Time（s）	Remarks
1	Feeding time	30～40	
2	Vacuum time	30～40	
3	Oil / Fat coating time	100～120	Spiral rotor rotating forward
4	Vacuum release time	30～60	
5	Discharge time	30～40	Spiral rotor rotating in reverse

Note:

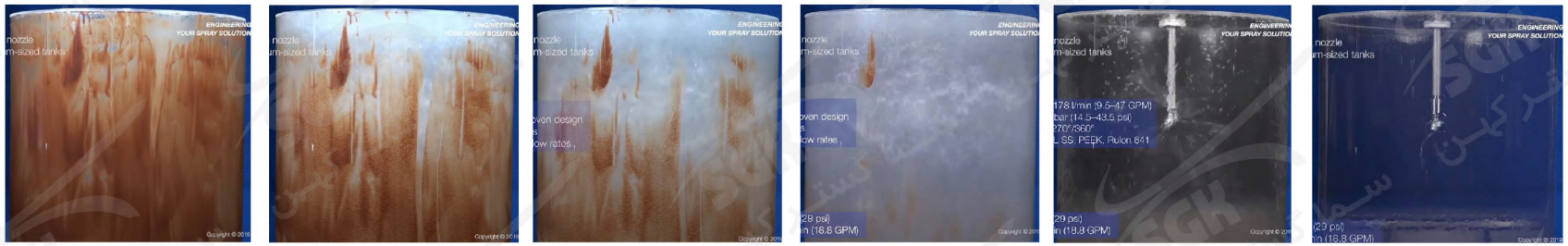
1. The specific time is based on the actual amount of oil / fat added.
2. The vacuum release time can be controlled for different oil / fat addition ratios.

Vacuum Coating - CIP Cleaning (Clean In Position)



Cover top installation

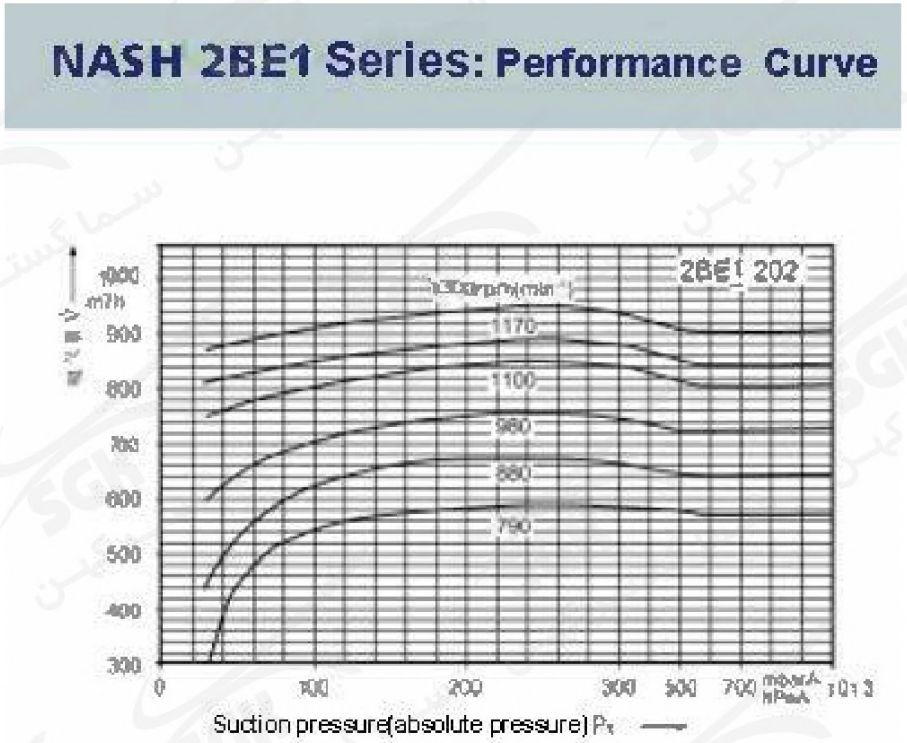
Germany LECHLER-rotary cleaning nozzle



Main equipment - Vertical Vacuum Coater

The shape of “Alchemy Furnace” combines Chinese tradition and modern culture, stable and efficient and refines the essence.

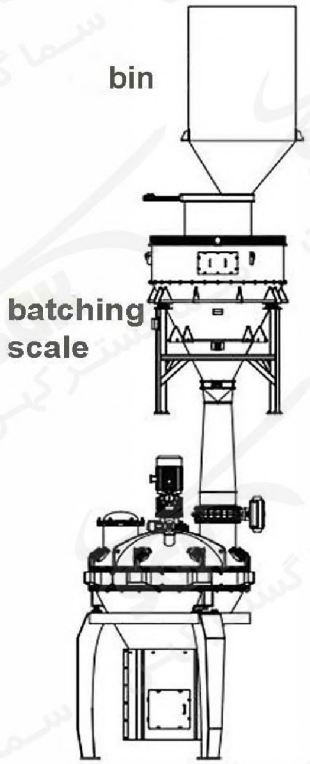
Auxiliary Equipment - Vacuum-pumping System



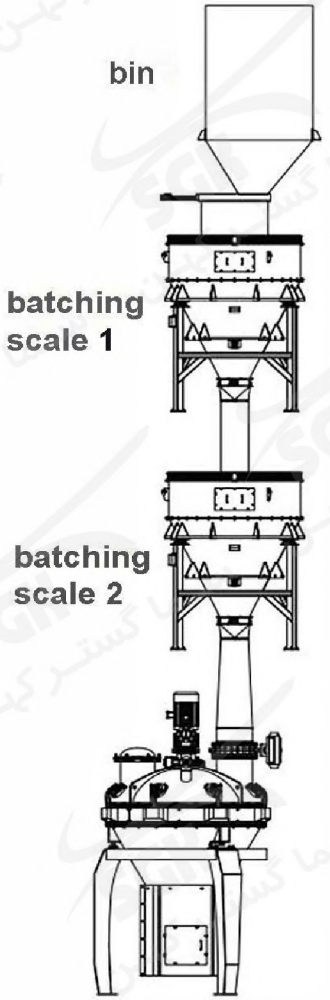
Liquid Ring Vacuum Pump:

The air inside the cavity of the vacuum coater and the air inside the feed pellets are vacuumed out to ensure the necessary vacuum degree requirements.

Auxiliary Equipment - Feed Pellets Batching Scale



single bin + single batching scale



single bin + double batching scales

Feeding Batching Scale:

1. Quantitatively and accurately weigh the feed pellets to ensure the filling factor of the feed pellets in the vacuum coater and ensure the uniformity of coating;
2. Standard single bin + single batching scale, optional single bin + double batching scales, the last batch of feed pellets can be weighed more accurately and will not be wasted.

Auxiliary Equipment - Weighing Type Liquid Adding System

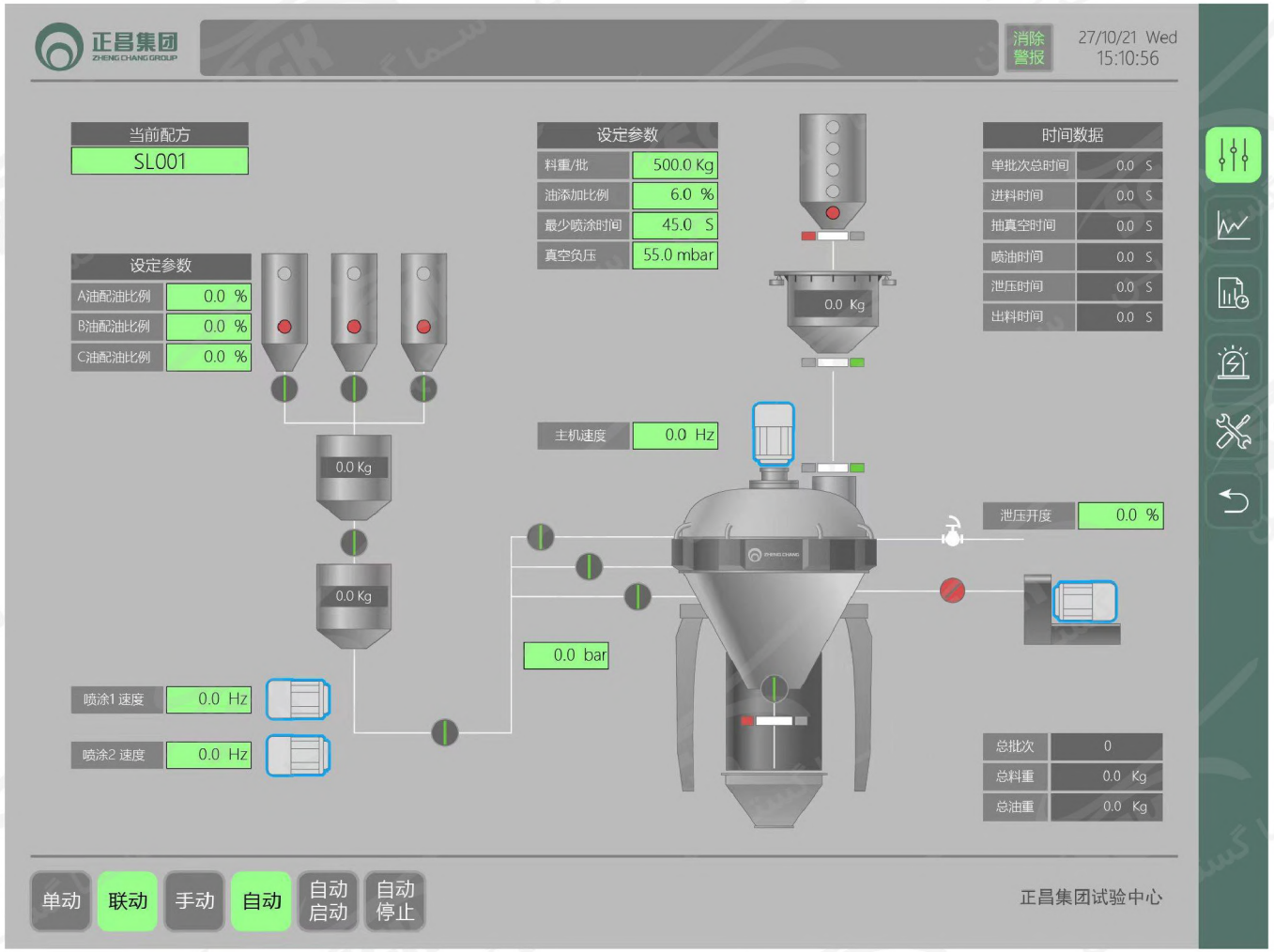
Storage tank:

Ensuring continuous production of the coater and not affected by the failure of upstream equipment.

Liquid Scale:

1. Proportioning the weight of the liquid to be added according to the weight weighed in real time by the feeding batching scale.
2. Adopting the form of upper and lower double weighing hoppers: the upper weighing hopper is used to pre-store the required liquid amount, and the lower weighing hopper is used to weigh the required liquid, thereby reducing the time for liquid weighing, improving production efficiency and ensuring the accuracy of liquid weighing.

Intelligent Control System



Intelligent Control System:

1. Flexible control, which can be integrated into the control system of the existing plant, and can also be controlled automatically or manually alone.
2. Equipped with intelligent control system, it can switch intelligently in the formula system according to different feed pellets produced by the users, and can remotely monitor the operating status of the equipment, automatically collect data and provide real-time feedback.

Intelligent Control System

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Ensure personnel safety and equipment operation safety	Optimize quality				Increase equipment capacity
Equipment interlock	No-material automatic stop function	Multi-stage pressure relief function	Automatic control of coating time	coating pump with frequency control	Fully automatic oil / fat coating control
Safety travel switch	Multi level indicator configuration of pre-coating bins	Batching cleaning function	coating fliquid pressure detection	Load cell control	Production data recipe management
Emergency stop switch	Large/small door opening control function for feeding between the pre-coating bin and the scale	Equipped with vacuum pressure sensor	Equipped with multi-pipe coating automatic control function	Maintenance monitoring and reminding	
	Spiral rotor with frequency control	Equipped with large/small coating pumps	Oil tank with stirring function	Production data collection report	

Control functions of the vacuum coating system

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Thank You!

江苏正昌粮机股份有限公司

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