



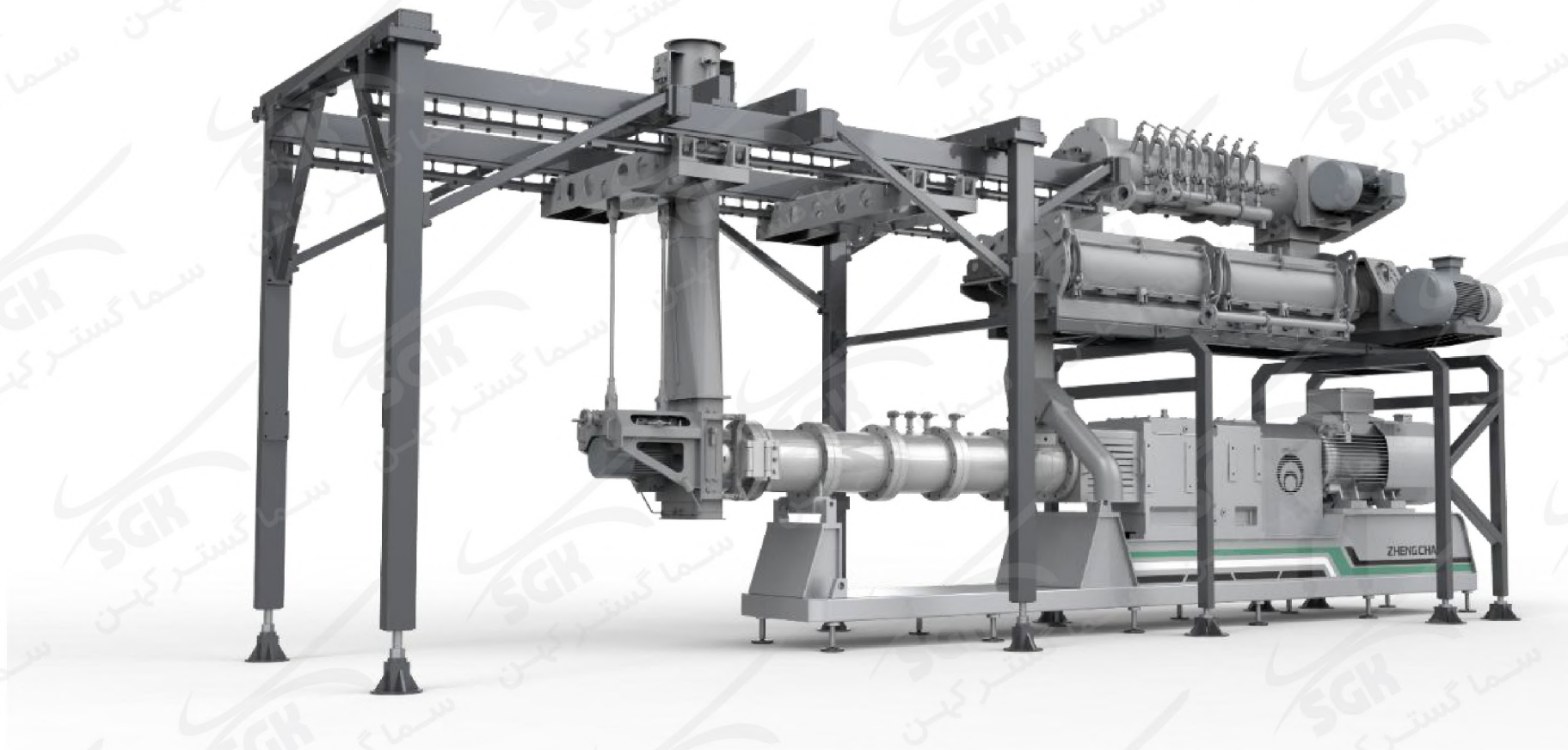
正昌粮机股份
ZHENGCHANG CEREAL AND FEED MACHINERY



正昌粮机股份
ZHENGCHANG CEREAL AND FEED MACHINERY

SPHS Series Twin-screw Extruder

Zhengchang Research Institute



Stability and Reliability Contribute to Long-term Development

饲料机械 中国正昌

Application Range of Twin-screw Extruder

Type of Extruded Feeds	Category Subdivision	Representative Species	Remark
Extruded Floating Feed	common freshwater fish	catfish, tilapia, grass carp, herring, carp, crucian carp, bream	
	special freshwater fish	salmon, California bass, raw fish, rice field eel, Erythroculter ilishaeformis, pond lice	
	high-grade sea fish	sea bass, golden pomfrets, real sea bream, American redfish, large yellow croaker	
	amphibian reptiles	tortoise, turtle, frog	Frog feed requires high viscoelasticity
	pet food	dog food, cat food, etc.	High requirements for feed type and hygiene
Extruded Sinking Feed	freshwater category	sturgeon, rainbow trout, crab, shrimp	Rainbow trout have high fat requirement
	sea water category	semi-smooth tongue sole, grouper, shrimp, abalone	
Extruded Slow Sinking Feed	freshwater category	sturgeon	
	sea water category	bluefish, turbot	Pellet shape /high in fat
		large yellow croaker	Flaky shape/high in fat

Technical Parameters of Zhengchang Twin-screw Extruder

Technical Parameters of Zhengchang Twin-screw Extruder

Model	SPHS75×2	SPHS100×2	SPHS125×2	SPHS155×2	SPHS175×2	Remark
Screw Diameter	76	107	133	155	176	
Main Power (KW)	75	110/132	200/250	315/355	560/630	VFD
Capacity	0.8-1.5	2-3	5.5 ~ 7.5	10 ~ 12	15 ~ 16	Floating Feed Die Hole φ4.0mm
	0.4-1	1.5-2	4 ~ 5	6 ~ 8	8 ~ 10	Sinking Feed Die Hole φ4.0mm
Length-to-diameter ratio	20:1	20:1	20:1	20:1	20:1	

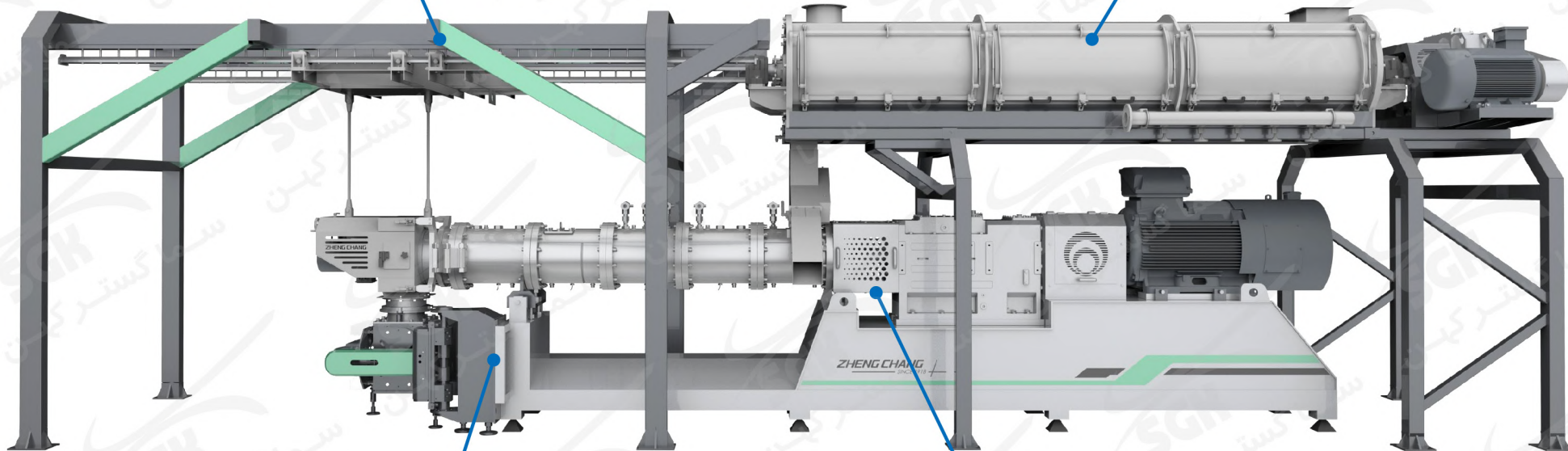
Aquatic Twin-screw Extruder Main Body Introduction

Slidable Hanging Cutting

Simple operation and convenient maintenance

Multi-layer Conditioning System can be configured

Modular adjustment according to customer's conditioning time requirements



New Pressurized Density Control System (ECS)

Combination of new wear-resistant seal and air seal
Effective pressure holding and stable production quality of sinking feed

Convenient Disassembly and Installation of the Screw

Special anti-corrosion sealing structure
Effectively protect the main shaft screw



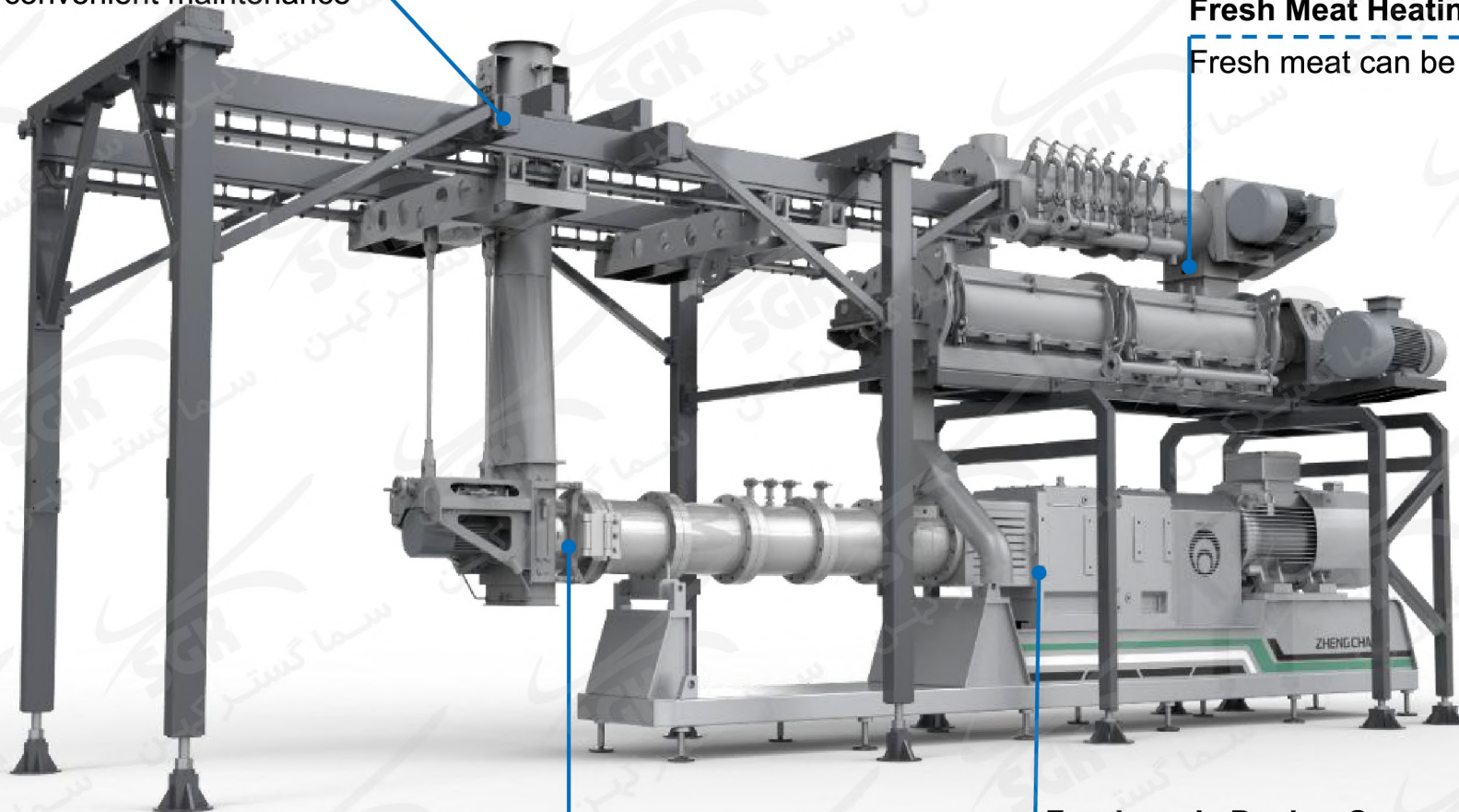
Pet Food Twin-screw Extruder Main Body Introduction

Slidable Upper Discharge Device

Simple operation and convenient maintenance

High Shear Conditioning System & Fresh Meat Heating and Adding System

Fresh meat can be added up to 100%



Unique Venturi Discharge System

Configuring BPV to adjust the mechanical energy input of the extruder online

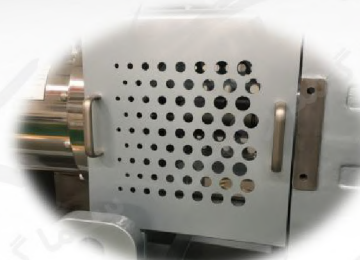
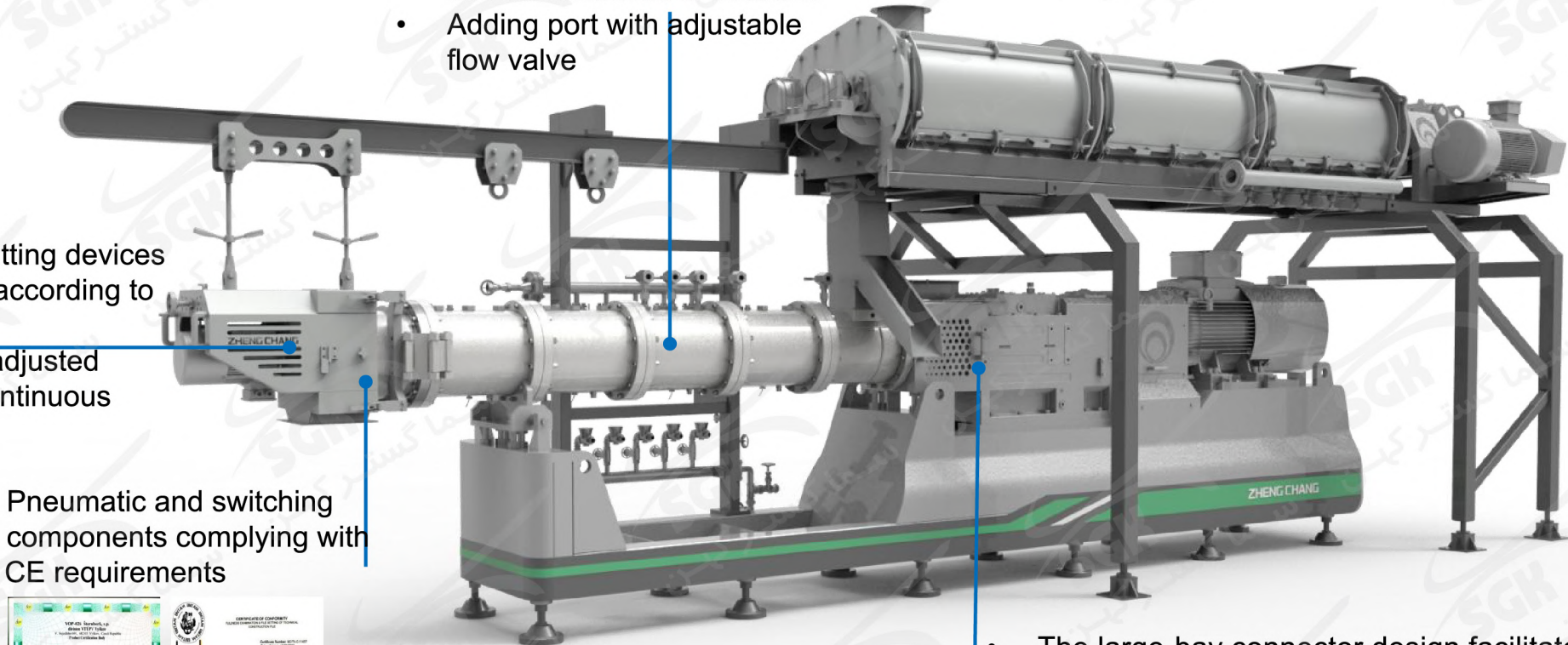
Food-grade Design Concept and Food-grade Sealing Material

Ensuring hygienic requirements for pet food production

Twin-screw Extruder Hardware Configuration

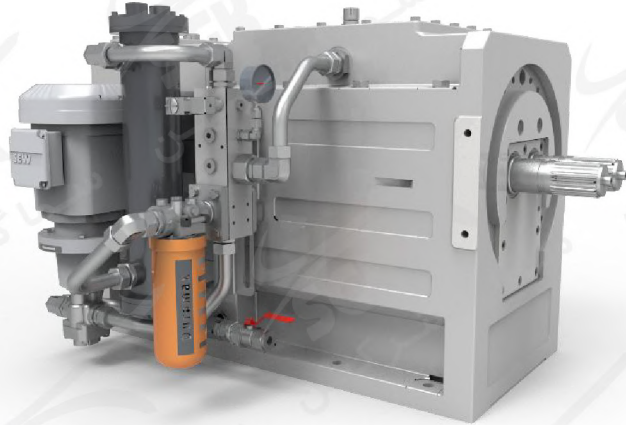
- Single-guide rail cutting devices can be configured according to customer needs.
- The cutter can be adjusted online to ensure continuous production.
- Pneumatic and switching components complying with CE requirements

- Barrel cooling and heating can be controlled in sections
- Adding port with adjustable flow valve



- The large-bay connector design facilitates the installation of the spline coupling and the maintenance of main shaft seals.
- Food-grade sealing packing, flexible, wear-resistant, dimensionally stable and corrosion-resistant, in line with FDA requirements.

Twin-screw Extruder Hardware Configuration



- Full use of imported brand European and American standard gearboxes.
- Equipped with temperature, pressure and other monitoring sensors.
- Equipped with high-precision gears and tandem bearings.

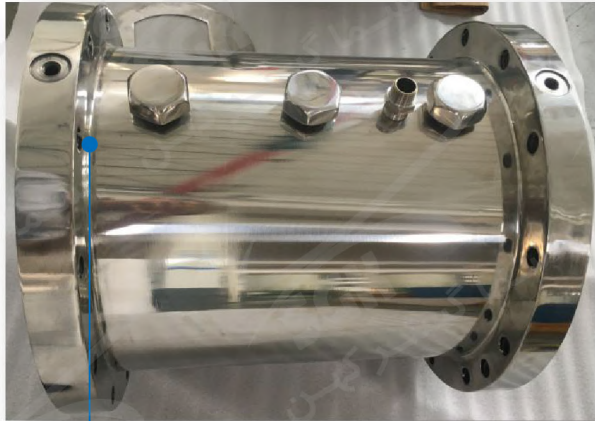
Compared with domestic gearboxes, it has longer service life, higher stability and lower temperature rise.



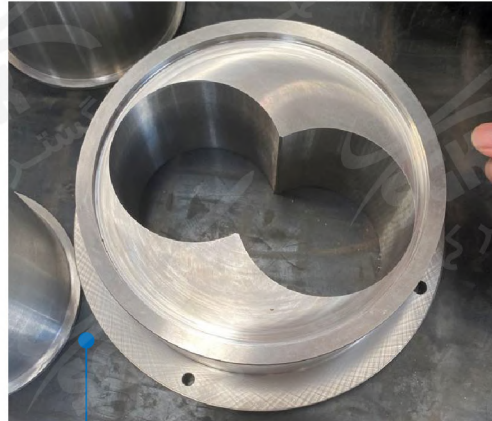
- Torque limiter imported from Germany, equipped with inductive monitoring sensor.
- It will be disengaged quickly once the equipment is overloaded and the reset is convenient, without affecting the production.
- Equipped with signal switch, disengage and stop the host at the same time.

Traditional couplings do not have overload protection function, and the gearbox and motor are easily damaged after overloading.

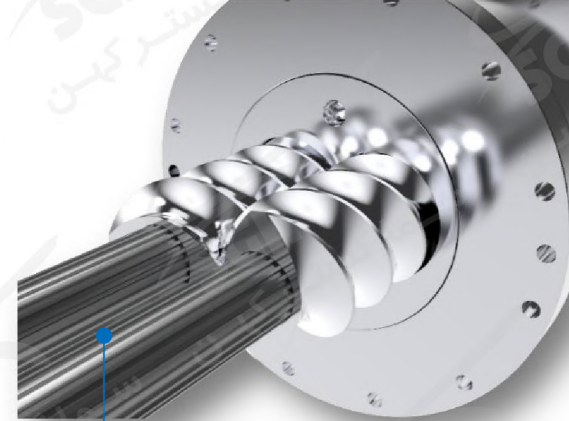
Twin-screw Extruder Hardware Configuration



Each extruding chamber is equipped with independent steam and water adding port. Segmented control, Flow adjustable



Leading bushing service life in the industry

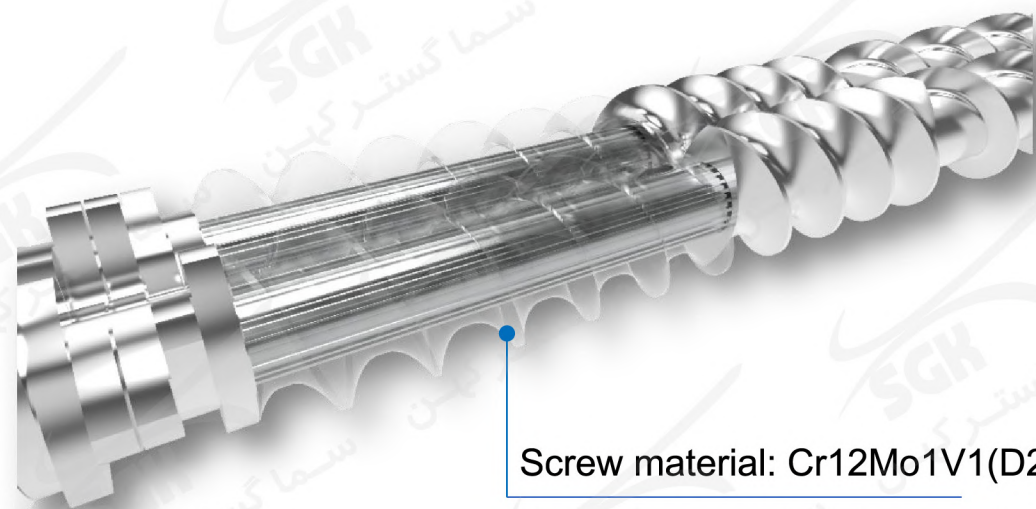


High-precision screw matched with bushing

- The surface of the extruding chamber can be optionally equipped with brushed stainless steel and high temperature resistant metallic paint.
- Integral forged bushings; The forging materials are denser compared with traditional casting bushings.
- The mechanical properties of forgings are better, so that the risk of cracking in the bushing is lower, and it is more wear-resistant and corrosion-resistant.

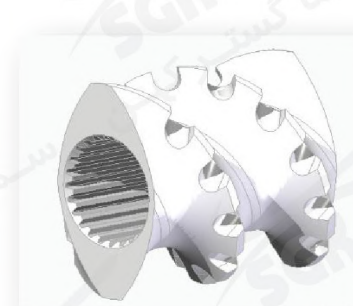
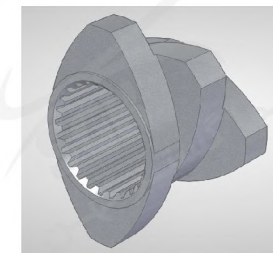
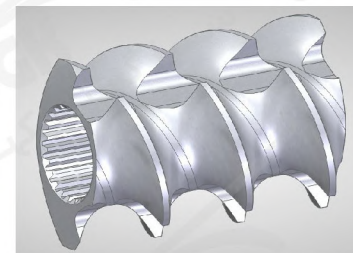


Twin-screw Extruder Hardware Configuration



Screw material: Cr12Mo1V1(D2)

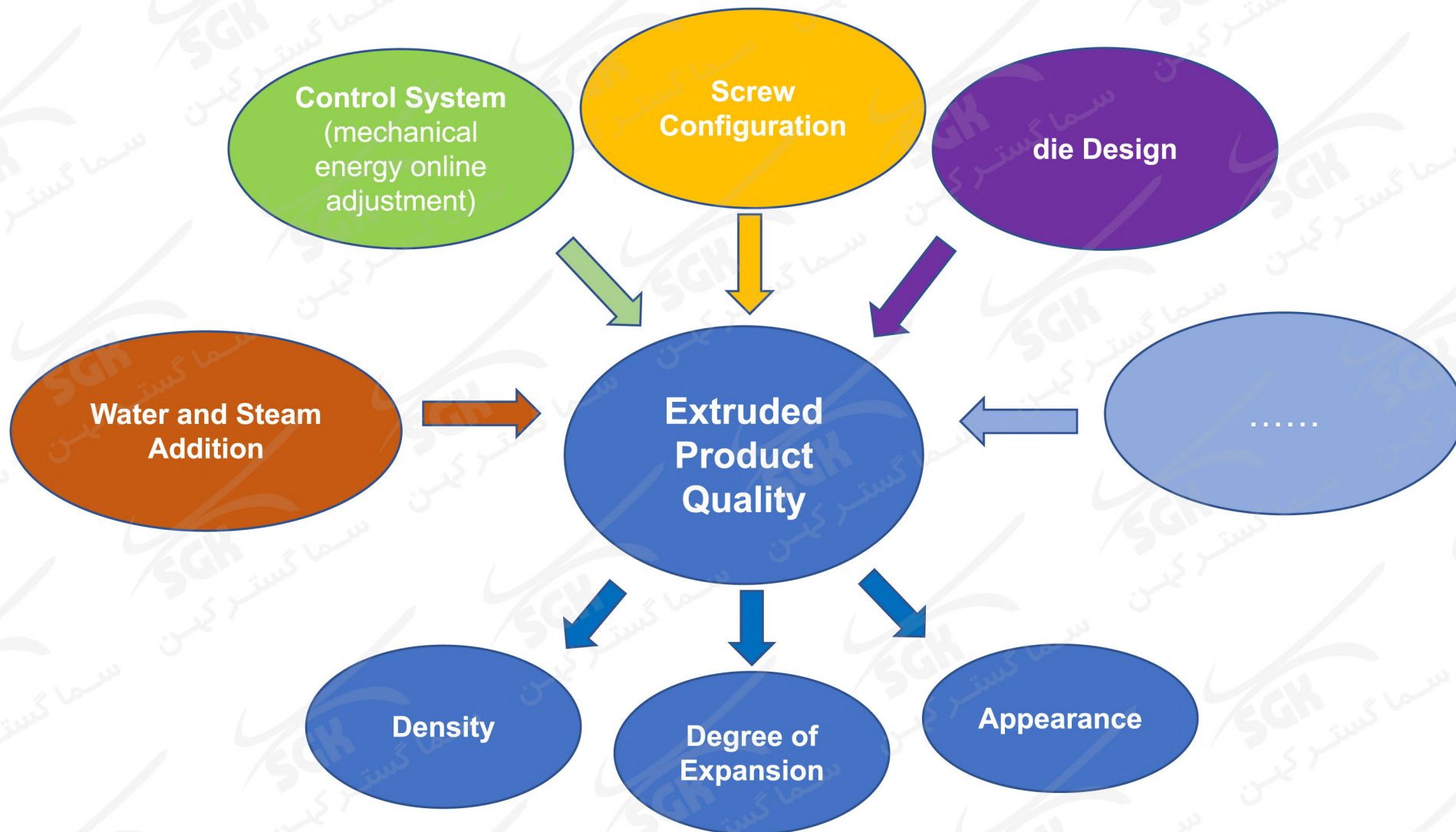
High carbon and high chromium cold work mold steel



- The screw uses a new type of material, which has greatly improved the wear resistance and corrosion resistance compared with traditional nitriding steel.
- The screw can be equipped with the latest powder alloy materials, and the service life can reach more than three times the current industry average level.

Extruded Product Quality

Through the matching of water, steam and mechanical energy, the temperature and pressure of the extruding system can be precisely controlled to ensure product quality.

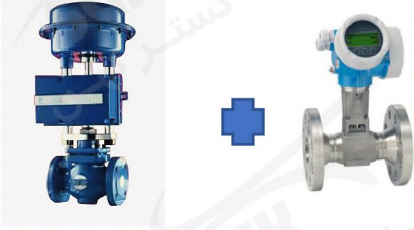


Extruded Product Quality - Water and Steam Addition

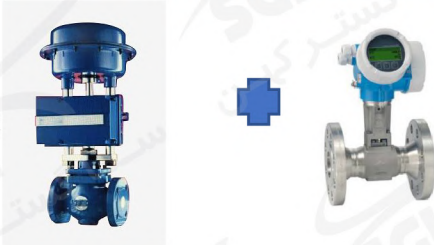
Steam Addition Control

Water Addition Control

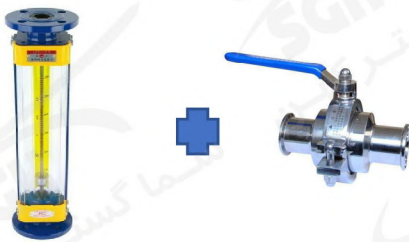
Fully automatic control



Semi-automatic control



Manual control



- All imported control valves and flowmeter configuration
- PID control of regulating valve and flow meter with online adjustment according to extruding capacity.
- The water addition system is equipped with a unique dynamic differential pressure balance regulating valve to ensure stable pressure and flow. (The atomization effect of the conditioning nozzle and the water addition effect of the extrusion chamber are greatly affected by the fluctuation of the front and rear water pressure, which affects the conditioning and mixing effect.)
- Sanitary water adding piping system to ensure product quality.



Ensure Precise Addition

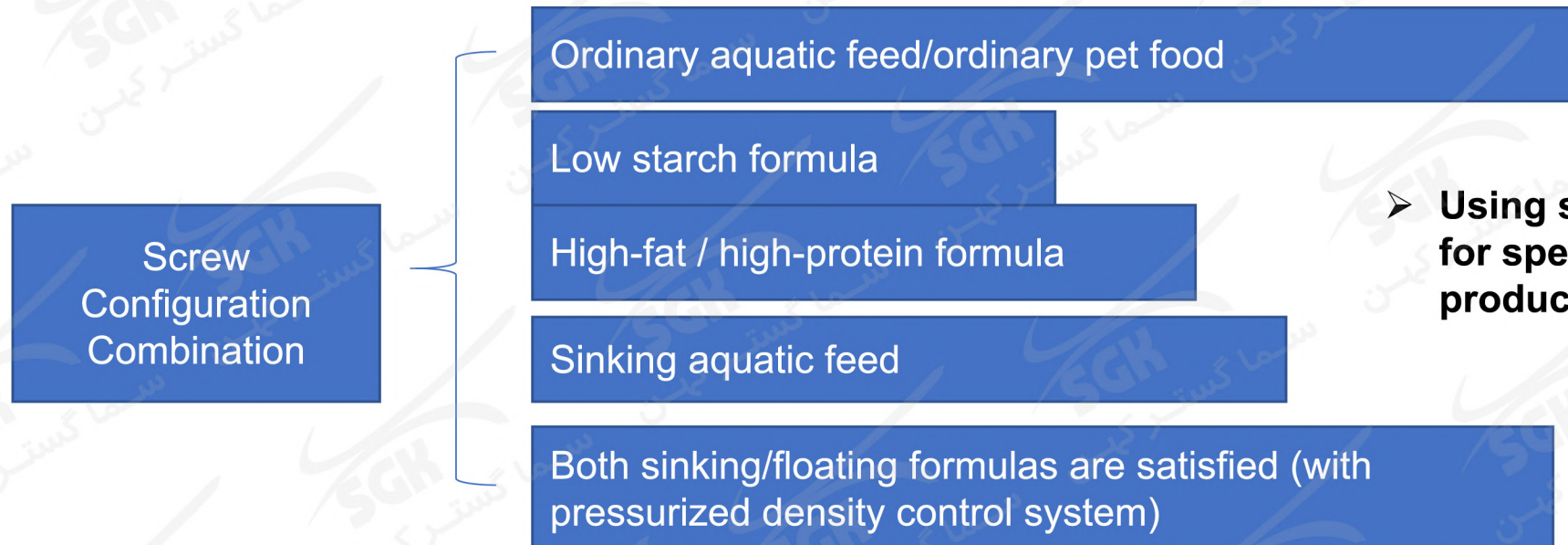
According to customer needs, three water and steam addition configuration methods can be selected.



Extruded Product Quality - Screw Configuration



- A variety of different screw configurations can be equipped according to customer's requirements for different formulas and different products.



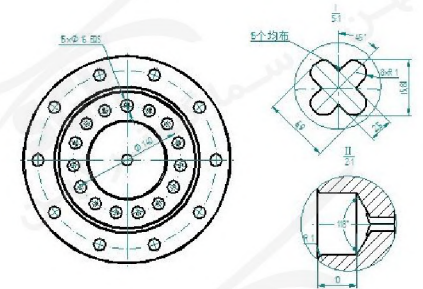
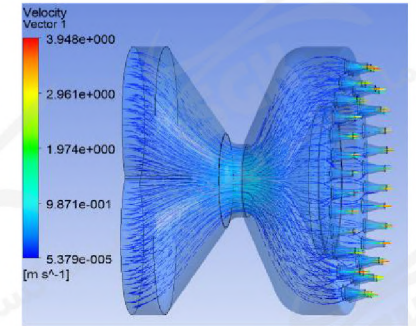
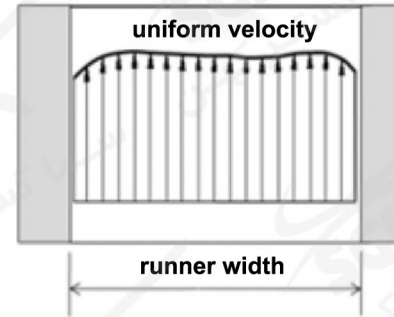
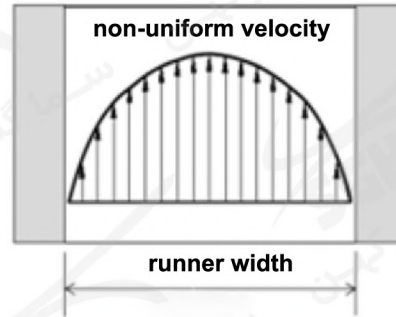
- **Using special screw configurations for special formulas to ensure the product quality.**

Extruded Product Quality - Die Design

Unique die design to ensure stable and uniform discharge



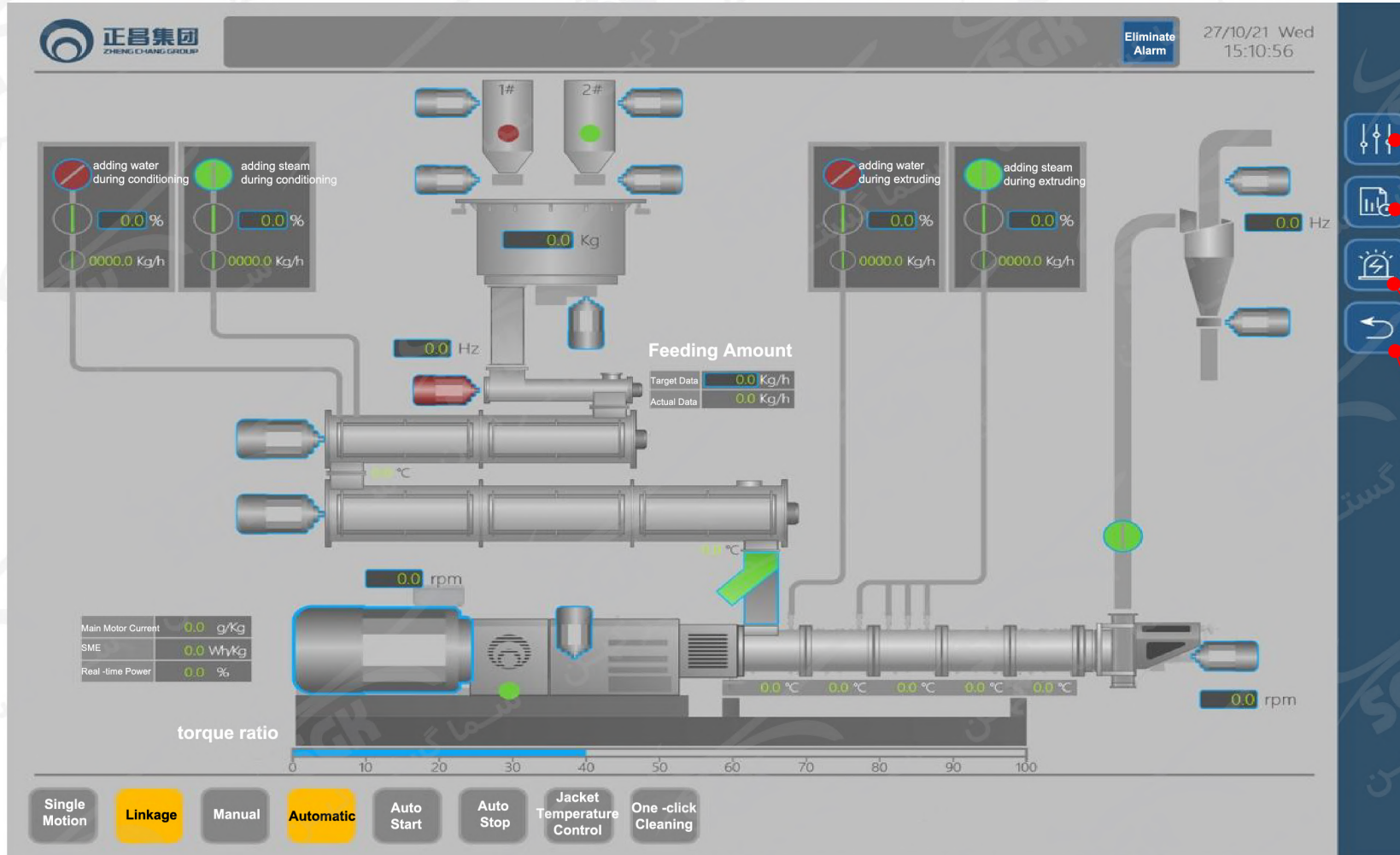
Unique die structure design ensures longer service life



- Using European die hole structure and step hole process design technology, the particle size of the feeds is consistent and the appearance is beautiful.
- Designing die size and die hole shape according to customer needs.
- The unique die structure design avoids the risk of die cracking compared with that of other manufactures in the industry.
- Parameter design of special die for pet food.
- The discharge flow rate is uniform, the product appearance is good, and the quality is high.

Extruded Product Quality - Fully Automatic Control System

Convenient, Safe, Reliable

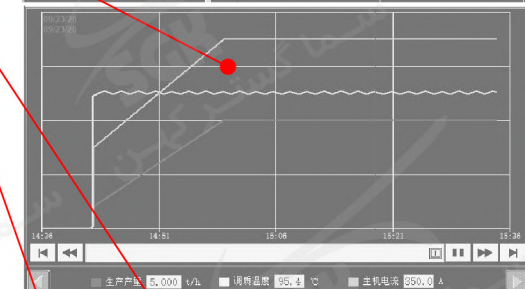


配方选择
SL001
SL002
3
1

配方名称: SL001

模头孔径	4.0	mm
最大电流	0.0	A
分料盒重量	0.0	kg
目标喂料量	18.000	t/h
调质最大蒸汽开度	0	%
调质目标温度	0.0	°C
调质加水比例	18	%
膨化加水比例	16	%
膨化蒸汽比例	12	%
膨化加水比例	10	%
目标主机转速	0	rpm
设定切刀转速	0	rpm
冷后-初始喂料量	0.000	t/h
冷后-初始主机速度	0	rpm
热后-初始喂料量	0.000	t/h
热后-初始主机速度	0	rpm
停机喂料量	0.000	t/h
停机主机速度	0	rpm

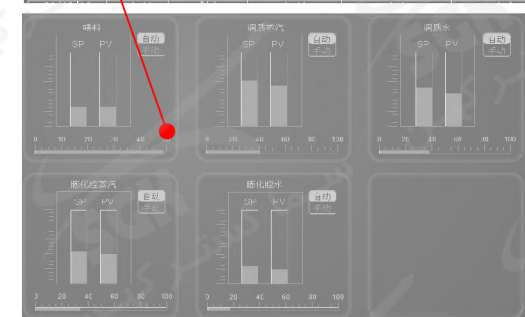
formula selection and recording interface



host production status interface

日期	时间	配方名称	产量 (t/h)	调质温度 (°C)	主机电流 (A)
2020/8/13	14:02	a	0.00	0.0	0.0
2020/8/13	14:02	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:01	a	0.00	0.0	0.0
2020/8/13	14:00	a	0.00	0.0	0.0
2020/8/13	14:00	a	0.00	0.0	0.0

real-time production dynamic recording



material and water vapor parameters interface

- Efficient automatic control system: with multiple functions such as formula management, one-button start-up, load control, precise water and steam addition, production data recording, etc.
- Configure three modes: manual, debugging, automatic
- The mechanical energy can be adjusted online to perfectly match the customer's formula and product to ensure product quality.

Twin-screw Extruder Configuration

Zhengchang Twin-screw Extruder Configuration

Model	SPHS75×2	SPHS100×2	SPHS125×2	SPHS155×2	SPHS175×2	Remark
Power(KW)	75	110/132	200/250	315/355	560/630	VFD
Live Bin	WLT1200(2.2kW)	WLT1200(2.2kW)	WLT1200(2.2kW)	WLT1200(3kW)	WLT1600(4kW)	
Screw Feeder	SWLD14(1.5kW)	SWLD14(1.5kW)	SWLD18(2.2kW)	SWLD23(3kW)	SWLD26(4kW)	VFD
Conditioner	STZD400(11kW)	STZD400(11kW)	STZD400(11kW)	STZD550(15kW)	STZD550(15kW)	
Double-shaft Differential Speed Conditioner	STZY280 (18.5kW)	STZY280 (18.5kW)	STZY390 (22kW)	STZY450 (30kW)	STZY450 (37kW)	
Cutter Motor	YVF2(2.2kW)	YVF2(2.2kW)	YVF2(4kW)	YVF2(5.5kW)	YVF2(7.5kW)	VFD

High-quality Outsourcing Suppliers



Endress+Hauser

People for Process Automation



Airtac

SEW
EURODRIVE

Driving the world

spirax
sarco

Honeywell



Quality Inspection of Extruded Products

Texture, ripening degree, formula composition, etc.

Texture inspection of extruded baked products:

Appearance of experimental extruded baked products



Cross-section of experimental extruded baked products



Using a laboratory texture analyzer to measure the maximum load of three different materials when they crack (under the same working conditions), it can be inferred that the crispness of extruded baked products has reached the standard for dry biscuits.

Appearance of edible biscuits



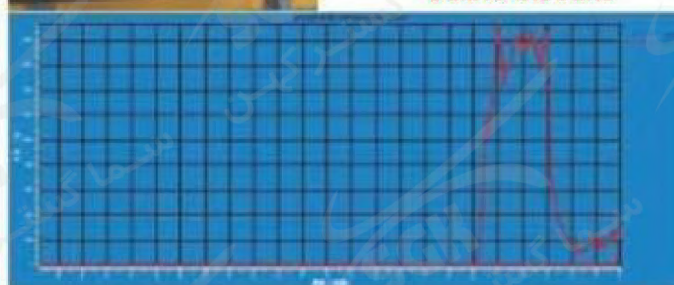
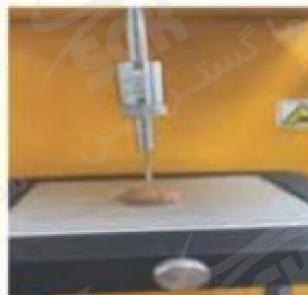
Cross-section of edible biscuits



The maximum bearing capacity of Xiaowantong's ordinary cat food 5513g



The maximum bearing capacity of extruded baked products 1823g

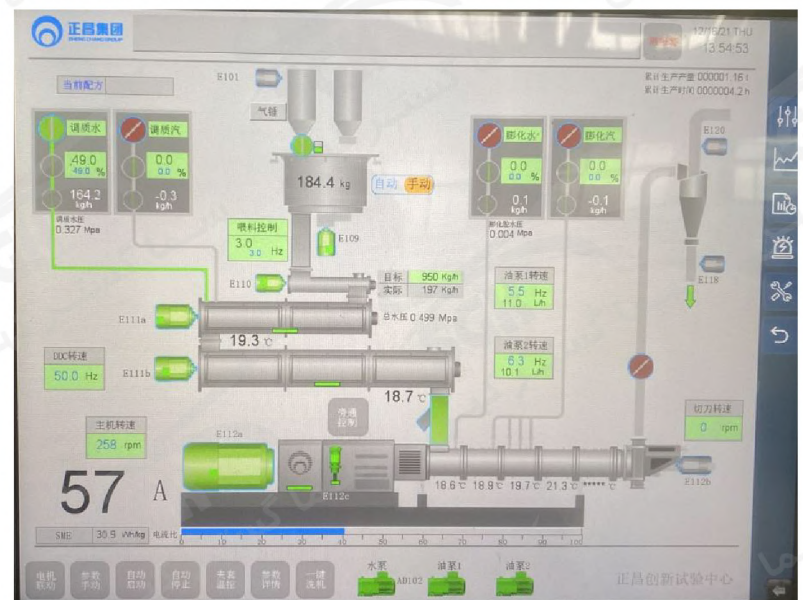
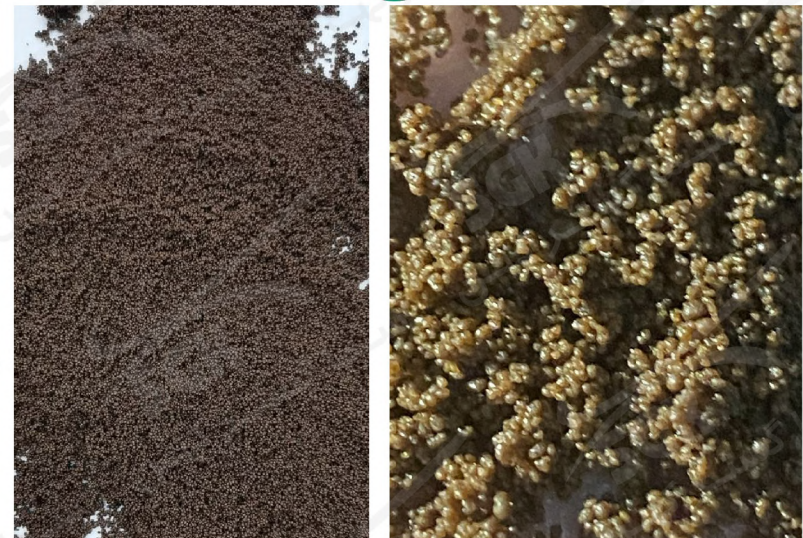


The maximum bearing capacity of ordinary edible biscuits 1914g

Application in Engineering Site



Application in Experimental Center



0.3mm tiny particle experiment



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Thank You!

江苏正昌粮机股份有限公司

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